

# 2008 Mazda MX-5 (Miata) Workshop Manuals

## 2008 MX-5 Service Highlights

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## 2008 MX-5 Wiring Diagram and Workshop Manual

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## Workshop Manual - General Information

2008 - MX-5

### General Information

- VEHICLE IDENTIFICATION NUMBER (VIN) CODE
- VEHICLE IDENTIFICATION NUMBER (VIN)
- HOW TO USE THIS MANUAL
- UNITS
- SERVICE CAUTIONS
- INSTALLATION OF RADIO SYSTEM
- ELECTRICAL SYSTEM
- JACKING POSITIONS
- VEHICLE LIFT (2 SUPPORTS) AND SAFETY STAND (RIGID RACK) POSITION
- TOWING
- TIEDOWN HOOK
- IDENTIFICATION NUMBER LOCATIONS
- SAE STANDARDS
- ABBREVIATIONS
- PRE-DELIVERY INSPECTION
- SCHEDULED MAINTENANCE



## Workshop Manual - Engine

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- ENGINE TECHNICAL DATA [LF]

### Maintenance/Service Tools

- ENGINE SST [LF]

## Workshop Manual - Suspension

2008 - MX-5

### On-Board Diagnostics

- TIRE PRESSURE MONITORING SYSTEM (TPMS) WIRING DIAGRAM
- TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS
- MALFUNCTIONING WHEEL UNIT IDENTIFICATION
- DTC B2143
- DTC B2868, B2869, B2870, B2871
- DTC U0127
- DTC U2616, U2617, U2618, U2619

### Symptom Troubleshooting

- TIRE PRESSURE MONITORING SYSTEM (TPMS) WIRING DIAGRAM
- FOREWORD
- PRECAUTION
- SYMPTOM TROUBLESHOOTING
- NO.1 TPMS WARNING LIGHT ILLUMINATES CONTINUOUSLY
- NO.2 TPMS WARNING LIGHT (LOW PRESSURE WARNING) ILLUMINATES AFTER ENGINE START AND TURNS OFF AFTER DRIVING FOR PERIOD OF TIME
- NO.3 FLAT TIRE WARNING LIGHT (FLAT TIRE WARNING) ILLUMINATES
- NO.4 WHEEL UNIT ID REGISTRATION CANNOT BE PERFORMED (TPMS WARNING LIGHT FLASHES)

### General Procedures

- GENERAL PROCEDURES (SUSPENSION)

### Wheel Alignment

- WHEEL ALIGNMENT PRE-INSPECTION
- FRONT WHEEL ALIGNMENT
- REAR WHEEL ALIGNMENT

### Wheels and Tires

- WHEEL AND TIRE SPECIFICATION
- WHEEL BALANCE ADJUSTMENT
- TIRE PRESSURE ADJUSTMENT (WITH TPMS)
- REPAIR AGENT REMOVAL
- WHEEL UNIT ID REGISTRATION
- WHEEL UNIT REMOVAL/INSTALLATION

### Front Suspension

- FRONT SUSPENSION LOCATION INDEX



- FRONT SHOCK ABSORBER AND COIL SPRING REMOVAL/INSTALLATION
- FRONT SHOCK ABSORBER AND COIL SPRING DISASSEMBLY/ASSEMBLY
- FRONT SHOCK ABSORBER INSPECTION
- FRONT SHOCK ABSORBER DISPOSAL
- FRONT UPPER ARM REMOVAL/INSTALLATION
- FRONT UPPER ARM INSPECTION
- FRONT LOWER ARM REMOVAL/INSTALLATION
- FRONT LOWER ARM INSPECTION
- FRONT STABILIZER REMOVAL/INSTALLATION
- FRONT STABILIZER CONTROL LINK INSPECTION
- FRONT CROSSMEMBER REMOVAL/INSTALLATION
- FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION
- TRANSVERSE MEMBER REMOVAL/INSTALLATION

## Rear Suspension

- REAR SUSPENSION LOCATION INDEX
- REAR SHOCK ABSORBER AND COIL SPRING REMOVAL/INSTALLATION
- REAR SHOCK ABSORBER AND COIL SPRING DISASSEMBLY/ASSEMBLY
- REAR SHOCK ABSORBER INSPECTION
- REAR SHOCK ABSORBER DISPOSAL
- REAR LATERAL LINK (UPPER) REMOVAL/INSTALLATION
- REAR LATERAL LINK (LOWER) REMOVAL/INSTALLATION
- REAR LATERAL LINK (UPPER) INSPECTION
- REAR LATERAL LINK (LOWER) INSPECTION
- TOE CONTROL LINK REMOVAL/INSTALLATION
- TOE CONTROL LINK INSPECTION
- REAR STABILIZER REMOVAL/INSTALLATION
- REAR STABILIZER CONTROL LINK INSPECTION
- REAR TRAILING LINK (UPPER) REMOVAL/INSTALLATION
- REAR TRAILING LINK (LOWER) REMOVAL/INSTALLATION
- REAR TRAILING LINK (UPPER) INSPECTION
- REAR CROSSMEMBER REMOVAL/INSTALLATION

## Technical Data

- SUSPENSION TECHNICAL DATA

## Maintenance/Service Tools

- SUSPENSION

# Workshop Manual - DriveLine/Axle

2008 - MX-5

## General Procedures

- GENERAL PROCEDURES (FRONT AND REAR AXLES)

## Front Axle

- FRONT AXLE LOCATION INDEX
- WHEEL HUB, STEERING KNUCKLE INSPECTION
- WHEEL HUB, STEERING KNUCKLE REMOVAL/INSTALLATION
- FRONT WHEEL HUB BOLT REPLACEMENT

## Rear Axle

- REAR AXLE LOCATION INDEX
- WHEEL HUB COMPONENT INSPECTION
- WHEEL HUB COMPONENT REMOVAL/INSTALLATION

## Drive Shaft

- REAR DRIVE SHAFT LOCATION INDEX
- REAR DRIVE SHAFT INSPECTION
- REAR DRIVE SHAFT REMOVAL/INSTALLATION
- REAR DRIVE SHAFT DISASSEMBLY/ASSEMBLY

## Differential

- REAR DIFFERENTIAL LOCATION INDEX
- DIFFERENTIAL OIL INSPECTION
- DIFFERENTIAL OIL REPLACEMENT
- OIL SEAL (SIDE GEAR) REPLACEMENT
- OIL SEAL (COMPANION FLANGE) REPLACEMENT
- REAR DIFFERENTIAL REMOVAL/INSTALLATION
- REAR DIFFERENTIAL DISASSEMBLY
- REAR DIFFERENTIAL ASSEMBLY

## Propeller Shaft

- PROPELLER SHAFT LOCATION INDEX
- PROPELLER SHAFT REMOVAL/INSTALLATION
- PROPELLER SHAFT INSPECTION

## Technical Data

- DRIVELINE/AXLE TECHNICAL DATA

**Maintenance/Service Tools**

- **DRIVELINE/AXLE SST**

## Workshop Manual - Brakes

### 2008 - MX-5

#### On-Board Diagnostics

- ABS SYSTEM WIRING DIAGRAM [ABS]
- ON-BOARD DIAGNOSIS [ABS]
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- DTC B1342 [ABS]
- DTC B1484 [ABS]
- DTC B2477 [ABS]
- DTC C1095, C1096 [ABS]
- DTC C1141, C1142, C1143, C1144 [ABS]
- DTC C1145, C1155, C1165, C1175 [ABS]
- DTC C1148, C1158, C1168, C1178 [ABS]
- DTC C1186, C1266 [ABS]
- DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254 [ABS]
- DTC C1233, C1234, C1235, C1236 [ABS]
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#### On-Board Diagnostics

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- ON-BOARD DIAGNOSIS [DYNAMIC STABILITY CONTROL (DSC)]
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- DTC B1342, C1730 [DYNAMIC STABILITY CONTROL (DSC)]
- DTC B1484, C1954 [DYNAMIC STABILITY CONTROL (DSC)]
- DTC B2477 [DYNAMIC STABILITY CONTROL (DSC)]
- DTC B2900, C1805 [DYNAMIC STABILITY CONTROL (DSC)]
- DTC C1093 [DYNAMIC STABILITY CONTROL (DSC)]
- DTC C1095, C1096 [DYNAMIC STABILITY CONTROL (DSC)]
- DTC C1134 [DYNAMIC STABILITY CONTROL (DSC)]
- DTC C1141, C1142, C1143, C1144 [DYNAMIC STABILITY CONTROL (DSC)]
- DTC C1145, C1155, C1165, C1175 [DYNAMIC STABILITY CONTROL (DSC)]
- DTC C1148, C1158, C1168, C1178 [DYNAMIC STABILITY CONTROL (DSC)]
- DTC C1186, C1266 [DYNAMIC STABILITY CONTROL (DSC)]
- DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254, C1400, C1410, C1957, C1958 [DYNAMIC STABILITY CONTROL (DSC)]
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- DTC C1295, C1307, C1937, C1938, C1956 [DYNAMIC STABILITY CONTROL (DSC)]
- DTC C1306 [DYNAMIC STABILITY CONTROL (DSC)]
- DTC C1805 [DYNAMIC STABILITY CONTROL (DSC)]

- DTC C1994 [DYNAMIC STABILITY CONTROL (DSC)]

## Symptom Troubleshooting

- SYSTEM WIRING DIAGRAM
- FOREWORD
- PRECAUTION
- SYMPTOM TROUBLESHOOTING
- NO.1 NEITHER ABS WARNING LIGHT NOR BRAKE SYSTEM WARNING LIGHT ILLUMINATE WHEN THE IGNITION SWITCH IS TURNED TO THE ON POSITION
- NO.2 ABS WARNING LIGHT DOES NOT ILLUMINATE WHEN IGNITION SWITCH TURNED TO ON POSITION
- NO.3 BRAKE SYSTEM WARNING LIGHT DOES NOT ILLUMINATE WHEN THE IGNITION SWITCH IS TURNED TO THE ON POSITION
- NO.4 BOTH ABS WARNING LIGHT AND BRAKE SYSTEM WARNING LIGHT STAY ON 4 S OR MORE WHEN THE IGNITION SWITCH IS TURNED TO THE ON POSITION
- NO.5 ABS WARNING LIGHT STAYS ON 4 S OR MORE WHEN IGNITION SWITCH TURNED TO ON POSITION
- NO.6 BRAKE SYSTEM WARNING LIGHT STAYS ON 4 S OR MORE WHEN IGNITION SWITCH TURNED TO ON POSITION
- NO.7 ANY OF THE FOLLOWING LIGHTS DO NOT ILLUMINATE WHEN IGNITION SWITCH TURNED TO ON POSITION: (ABS WARNING LIGHT, BRAKE SYSTEM WARNING LIGHT, DSC INDICATOR LIGHT AND/OR DSC OFF LIGHT)
- NO.8 ANY OF THE FOLLOWING LIGHTS REMAIN ON: (ABS WARNING LIGHT, BRAKE SYSTEM WARNING LIGHT, DSC INDICATOR LIGHT AND/OR DSC OFF LIGHT)
- NO.9 THERE IS A MALFUNCTION IN THE SYSTEM EVEN THOUGH ABS WARNING LIGHT, BRAKE SYSTEM WARNING LIGHT, DSC INDICATOR LIGHT AND DSC OFF LIGHT DO NOT ILLUMINATE
- NO.10 ABS OR TCS\*1 OPERATES FREQUENTLY/TCS DOES NOT WORK CORRECTLY\*1: DSC SYSTEM FUNCTION CONTAINS TRACTION CONTROL FUNCTION, DSC INDICATOR LIGHT GOES ON AND OFF WHILE TCS IS OPERATING
- NO.11 DSC\*2 OPERATES FREQUENTLY/DSC DOES NOT WORK CORRECTLY\*2: DSC INDICATOR LIGHT GOES ON AND OFF WHILE DSC IS OPERATING

## General Procedures

- GENERAL PROCEDURES (BRAKE)

## Conventional Brake System

- CONVENTIONAL BRAKE SYSTEM LOCATION INDEX
- AIR BLEEDING
- VACUUM LINE INSPECTION
- BRAKE PEDAL INSPECTION
- BRAKE PEDAL REMOVAL/INSTALLATION
- BRAKE SWITCH INSPECTION
- MASTER CYLINDER REMOVAL/INSTALLATION
- BRAKE FLUID LEVEL SENSOR INSPECTION
- POWER BRAKE UNIT INSPECTION
- POWER BRAKE UNIT REMOVAL/INSTALLATION
- DUAL PROPORTIONING VALVE REMOVAL/INSTALLATION
- DUAL PROPORTIONING VALVE INSPECTION
- FRONT BRAKE (DISC) INSPECTION
- FRONT BRAKE (DISC) REMOVAL/INSTALLATION
- DISC PAD (FRONT) REPLACEMENT
- CALIPER (FRONT) DISASSEMBLY/ASSEMBLY
- BRAKE HOSE (FRONT) REMOVAL/INSTALLATION
- REAR BRAKE (DISC) INSPECTION
- REAR BRAKE (DISC) REMOVAL/INSTALLATION
- DISC PAD (REAR) REPLACEMENT
- CALIPER (REAR) DISASSEMBLY/ASSEMBLY
- BRAKE HOSE (REAR) REMOVAL/INSTALLATION

## **Parking Brake System**

- PARKING BRAKE SYSTEM LOCATION INDEX
- PARKING BRAKE LEVER INSPECTION
- PARKING BRAKE LEVER ADJUSTMENT
- PARKING BRAKE LEVER REMOVAL/INSTALLATION
- PARKING BRAKE SWITCH INSPECTION

## **Antilock Brake System**

- ABS LOCATION INDEX
- ABS SYSTEM WIRING DIAGRAM
- ABS SYSTEM INSPECTION
- ABS HU/CM REMOVAL/INSTALLATION
- ABS CONFIGURATION
- ABS HU/CM INSPECTION
- FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION
- FRONT ABS WHEEL-SPEED SENSOR INSPECTION
- REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION
- REAR ABS WHEEL-SPEED SENSOR INSPECTION

## **Dynamic Stability Control**

- DYNAMIC STABILITY CONTROL LOCATION INDEX
- DSC SYSTEM WIRING DIAGRAM
- DSC SYSTEM INSPECTION
- DSC HU/CM REMOVAL/INSTALLATION
- DSC CONFIGURATION
- DSC HU/CM INSPECTION
- STEERING ANGLE SIGNAL INITIALIZATION PROCEDURE
- FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION
- FRONT ABS WHEEL-SPEED SENSOR INSPECTION
- REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION
- REAR ABS WHEEL-SPEED SENSOR INSPECTION
- COMBINED SENSOR REMOVAL/INSTALLATION
- COMBINED SENSOR INSPECTION
- COMBINED SENSOR INITIALIZATION PROCEDURE
- BRAKE FLUID PRESSURE SENSOR INSPECTION
- STEERING ANGLE SENSOR REMOVAL/INSTALLATION
- STEERING ANGLE SENSOR INSPECTION
- STEERING ANGLE SENSOR INITIALIZATION PROCEDURE
- DSC OFF SWITCH REMOVAL/INSTALLATION
- DSC OFF SWITCH INSPECTION

## **Technical Data**

- BRAKES TECHNICAL DATA

## **Maintenance/Service Tools**

- BRAKES SST

## Workshop Manual - Transmission/Transaxle

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### On-Board Diagnostics

- AUTOMATIC TRANSMISSION CONTROL SYSTEM WIRING DIAGRAM [SJ6A-EL]
- FOREWORD [SJ6A-EL]
- AUTOMATIC TRANSMISSION ON-BOARD DIAGNOSTIC FUNCTION [SJ6A-EL]
- AFTER REPAIR PROCEDURE [SJ6A-EL]
- DTC TABLE [SJ6A-EL]
- DTC P0601 [SJ6A-EL]
- DTC P0603 [SJ6A-EL]
- DTC P0604 [SJ6A-EL]
- DTC P0707 [SJ6A-EL]
- DTC P0708 [SJ6A-EL]
- DTC P0711 [SJ6A-EL]
- DTC P0712 [SJ6A-EL]
- DTC P0713 [SJ6A-EL]
- DTC P0717 [SJ6A-EL]
- DTC P0722 [SJ6A-EL]
- DTC P0751 [SJ6A-EL]
- DTC P0752 [SJ6A-EL]
- DTC P0756 [SJ6A-EL]
- DTC P0757 [SJ6A-EL]
- DTC P0761 [SJ6A-EL]
- DTC P0762 [SJ6A-EL]
- DTC P0766 [SJ6A-EL]
- DTC P0781 [SJ6A-EL]
- DTC P0819 [SJ6A-EL]
- DTC P0813 [SJ6A-EL]
- DTC P0826 [SJ6A-EL]
- DTC P0882 [SJ6A-EL]
- DTC P0883 [SJ6A-EL]
- DTC P0961 [SJ6A-EL]
- DTC P0962 [SJ6A-EL]
- DTC P0963 [SJ6A-EL]
- DTC P0969 [SJ6A-EL]
- DTC P0973 [SJ6A-EL]
- DTC P0970 [SJ6A-EL]
- DTC P0971 [SJ6A-EL]
- DTC P0974 [SJ6A-EL]
- DTC P0976 [SJ6A-EL]
- DTC P0977 [SJ6A-EL]
- DTC P0979 [SJ6A-EL]
- DTC P0980 [SJ6A-EL]

- DTC P0982 [SJ6A-EL]
- DTC P0983 [SJ6A-EL]
- DTC P0985 [SJ6A-EL]
- DTC P0986 [SJ6A-EL]
- DTC P2757 [SJ6A-EL]
- DTC P2719 [SJ6A-EL]
- DTC P2720 [SJ6A-EL]
- DTC P2721 [SJ6A-EL]
- DTC P2758 [SJ6A-EL]
- DTC P2762 [SJ6A-EL]
- DTC P2763 [SJ6A-EL]
- DTC P2764 [SJ6A-EL]
- PID/DATA MONITOR INSPECTION [SJ6A-EL]

## Symptom Troubleshooting

- AUTOMATIC TRANSMISSION CONTROL SYSTEM WIRING DIAGRAM [SJ6A-EL]
- FOREWORD [SJ6A-EL]
- BASIC INSPECTION [SJ6A-EL]
- SYMPTOM TROUBLESHOOTING ITEM TABLE [SJ6A-EL]
- QUICK DIAGNOSIS CHART [SJ6A-EL]
- NO.1 VEHICLE DOES NOT MOVE IN D RANGE, OR IN R POSITION [SJ6A-EL]
- NO.2 VEHICLE MOVES IN N POSITION [SJ6A-EL]
- NO.3 VEHICLE MOVES IN P POSITION, OR PARKING GEAR DOES NOT DISENGAGE WHEN P IS DISENGAGED [SJ6A-EL]
- NO.4 EXCESSIVE CREEP [SJ6A-EL]
- NO.5 NO CREEP AT ALL [SJ6A-EL]
- NO.6 LOW MAXIMUM SPEED AND POOR ACCELERATION [SJ6A-EL]
- NO.7 NO SHIFTING [SJ6A-EL]
- NO.8 DOES NOT SHIFT TO 6GR [SJ6A-EL]
- NO.9 ABNORMAL SHIFTING [SJ6A-EL]
- NO.10 FREQUENT SHIFTING [SJ6A-EL]
- NO.11 SHIFT POINT IS HIGH OR LOW [SJ6A-EL]
- NO.12 TORQUE CONVERTER CLUTCH (TCC) NON-OPERATION [SJ6A-EL]
- NO.13 NO KICKDOWN [SJ6A-EL]
- NO.14 ENGINE FLARES UP OR SLIPS WHEN UPSHIFTING OR DOWNSHIFTING [SJ6A-EL]
- NO.15 ENGINE FLARES UP OR SLIPS WHEN ACCELERATING VEHICLE [SJ6A-EL]
- NO.16 JUDDER UPON TORQUE CONVERTER CLUTCH (TCC) OPERATION [SJ6A-EL]
- NO.17 EXCESSIVE SHIFT SHOCK FROM N TO D OR N TO R POSITION/RANGE [SJ6A-EL]
- NO.18 EXCESSIVE SHIFT SHOCK IS GIVEN WHEN UPSHIFTING AND DOWNSHIFTING [SJ6A-EL]
- NO.19 EXCESSIVE SHIFT SHOCK ON TORQUE CONVERTER CLUTCH (TCC) [SJ6A-EL]
- NO.20 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN ALL POSITIONS/RANGES [SJ6A-EL]
- NO.21 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN D RANGE, OR IN R POSITION [SJ6A-EL]
- NO.22 NO ENGINE BRAKING [SJ6A-EL]
- NO.23 TRANSMISSION OVERHEATS [SJ6A-EL]
- NO.24 ENGINE STALLS WHEN SHIFTED TO D RANGE, OR IN R POSITION [SJ6A-EL]
- NO.25 ENGINE STALLS WHEN DRIVING AT SLOW SPEED OR STOPPING [SJ6A-EL]
- NO.26 STARTER DOES NOT WORK [SJ6A-EL]
- NO.27 GEAR POSITION INDICATOR LIGHT DOES NOT ILLUMINATE IN D OR M RANGE [SJ6A-EL]
- NO.28 GEAR POSITION INDICATOR LIGHT ILLUMINATE IN P, R AND N POSITION [SJ6A-EL]
- NO.29 DOES NOT UPSHIFT IN M RANGE [SJ6A-EL]
- NO.30 DOES NOT DOWNSHIFT IN M RANGE [SJ6A-EL]

## Clutch

- CLUTCH LOCATION INDEX
- GENERAL PROCEDURES (CLUTCH)
- CLUTCH FLUID INSPECTION



- CLUTCH FLUID REPLACEMENT
- CLUTCH PEDAL INSPECTION/ADJUSTMENT
- CLUTCH PEDAL REMOVAL/INSTALLATION
- CLUTCH MASTER CYLINDER REMOVAL/INSTALLATION
- CLUTCH MASTER CYLINDER DISASSEMBLY/ASSEMBLY
- CLUTCH RELEASE CYLINDER REMOVAL/INSTALLATION
- CLUTCH RELEASE CYLINDER DISASSEMBLY/ASSEMBLY
- CLUTCH UNIT REMOVAL/INSTALLATION
- CLUTCH COVER INSPECTION
- CLUTCH DISC INSPECTION
- CLUTCH RELEASE COLLAR INSPECTION
- PILOT BEARING INSPECTION
- FLYWHEEL INSPECTION

## Manual Transmission

- MANUAL TRANSMISSION LOCATION INDEX [M15M-D]
- NEUTRAL SWITCH REMOVAL/INSTALLATION [M15M-D]
- TRANSMISSION OIL INSPECTION [M15M-D]
- TRANSMISSION OIL REPLACEMENT [M15M-D]
- OIL SEAL (EXTENSION HOUSING) REPLACEMENT [M15M-D]
- VEHICLE SPEED SENSOR (VSS) INSPECTION [M15M-D]
- VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION [M15M-D]
- TRANSMISSION REMOVAL/INSTALLATION [M15M-D]
- INSPECTION AFTER TRANSMISSION INSTALLATION [M15M-D]

## Manual Transmission

- MANUAL TRANSMISSION LOCATION INDEX [P66M-D]
- NEUTRAL SWITCH REMOVAL/INSTALLATION [P66M-D]
- TRANSMISSION OIL INSPECTION [P66M-D]
- TRANSMISSION OIL REPLACEMENT [P66M-D]
- OIL SEAL (EXTENSION HOUSING) REPLACEMENT [P66M-D]
- VEHICLE SPEED SENSOR (VSS) INSPECTION [P66M-D]
- VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION [P66M-D]
- TRANSMISSION REMOVAL/INSTALLATION [P66M-D]
- INSPECTION AFTER TRANSMISSION INSTALLATION [P66M-D]

## Automatic Transmission

- AUTOMATIC TRANSMISSION LOCATION INDEX [SJ6A-EL]
- MECHANICAL SYSTEM TEST [SJ6A-EL]
- ROAD TEST [SJ6A-EL]
- AUTOMATIC TRANSMISSION FLUID (ATF) INSPECTION [SJ6A-EL]
- AUTOMATIC TRANSMISSION FLUID (ATF) REPLACEMENT [SJ6A-EL]
- AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT [SJ6A-EL]
- TRANSMISSION RANGE (TR) SWITCH INSPECTION [SJ6A-EL]
- TRANSMISSION RANGE (TR) SWITCH REMOVAL/INSTALLATION [SJ6A-EL]
- TRANSMISSION RANGE (TR) SWITCH ADJUSTMENT [SJ6A-EL]
- TRANSMISSION FLUID TEMPERATURE (TFT) SENSOR INSPECTION [SJ6A-EL]
- TRANSMISSION FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION [SJ6A-EL]
- TURBINE SENSOR INSPECTION [SJ6A-EL]
- TURBINE SENSOR REMOVAL/INSTALLATION [SJ6A-EL]
- VEHICLE SPEED SENSOR (VSS) INSPECTION [SJ6A-EL]
- VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION [SJ6A-EL]
- SOLENOID VALVE INSPECTION [SJ6A-EL]
- TCM INSPECTION [SJ6A-EL]
- TCM REMOVAL/INSTALLATION [SJ6A-EL]

- AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL]
- TORQUE CONVERTER REMOVAL/INSTALLATION [SJ6A-EL]
- OIL SEAL (OIL PUMP) REPLACEMENT [SJ6A-EL]
- OIL SEAL (EXTENSION HOUSING) REPLACEMENT [SJ6A-EL]
- CONTROL VALVE BODY REMOVAL [SJ6A-EL]
- CONTROL VALVE BODY INSTALLATION [SJ6A-EL]
- OIL COOLER FLUSHING [SJ6A-EL]
- OIL COOLER REMOVAL/INSTALLATION [SJ6A-EL]
- OIL COOLER DISASSEMBLY/ASSEMBLY [SJ6A-EL]
- DRIVE PLATE REMOVAL/INSTALLATION [SJ6A-EL]

### **Automatic Transmission Shift Mechanism**

- AUTOMATIC TRANSMISSION SHIFT MECHANISM LOCATION INDEX
- SHIFT LOCK INSPECTION
- KEY INTERLOCK INSPECTION
- INTERLOCK CABLE INSPECTION
- INTERLOCK CABLE ADJUSTMENT
- SELECTOR LEVER INSPECTION
- SELECTOR LEVER COMPONENT INSPECTION
- SELECTOR LEVER REMOVAL/INSTALLATION
- STEERING SHIFT SWITCH INSPECTION
- STEERING SHIFT SWITCH REMOVAL/INSTALLATION

### **Technical Data**

- TRANSMISSION/TRANSAXLE TECHNICAL DATA

### **Maintenance/Service Tools**

- TRANSMISSION/TRANSAXLE SST

# Workshop Manual - Steering

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## General Procedures

- GENERAL PROCEDURES (STEERING)

## Engine Speed Sensing - Power Steering

- STEERING LOCATION INDEX
- AIR BLEEDING
- POWER STEERING FLUID INSPECTION
- STEERING WHEEL AND COLUMN INSPECTION
- STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION
- STEERING SHAFT INSPECTION
- STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION
- STEERING GEAR AND LINKAGE DISASSEMBLY
- STEERING GEAR AND LINKAGE INSPECTION
- STEERING GEAR AND LINKAGE ASSEMBLY
- POWER STEERING OIL PUMP REMOVAL/INSTALLATION
- POWER STEERING OIL PUMP DISASSEMBLY/ASSEMBLY

## Technical Data

- STEERING TECHNICAL DATA

## Maintenance/Service Tools

- STEERING SST

# Workshop Manual - HVAC

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## Symptom Troubleshooting

- HVAC SYSTEM WIRING DIAGRAM
- FOREWORD
- TROUBLESHOOTING INDEX
- NO.1 INSUFFICIENT AIR (OR NO AIR) BLOWN FROM VENTS
- NO.2 AMOUNT OF AIR BLOWN FROM VENTS DOES NOT CHANGE
- NO.3 AIR INTAKE MODE DOES NOT CHANGE
- NO.4 AIR INTAKE MODE DOES NOT CHANGE
- NO.5 WINDSHIELD FOGGED
- NO.6 AIR FROM VENTS NOT COLD ENOUGH
- NO.7 AIR FROM VENTS NOT COLD ENOUGH
- NO.8 NOISE WHILE OPERATING A/C SYSTEM

## Refrigerant System

- REFRIGERANT SYSTEM SERVICE WARNINGS
- REFRIGERANT SYSTEM SERVICE CAUTIONS
- REFRIGERANT SYSTEM GENERAL PROCEDURES
- REFRIGERANT CHARGING
- REFRIGERANT RECOVERY
- REFRIGERANT PRESSURE CHECK
- REFRIGERANT SYSTEM PERFORMANCE TEST

## Basic System

- HVAC BASIC SYSTEM LOCATION INDEX
- A/C UNIT REMOVAL/INSTALLATION
- A/C UNIT DISASSEMBLY/ASSEMBLY
- AIR DIST UNIT REMOVAL/INSTALLATION
- AIR DIST UNIT DISASSEMBLY/ASSEMBLY
- EVAPORATOR INSPECTION
- HEATER CORE INSPECTION
- AIRFLOW MODE MAIN LINK REMOVAL/INSTALLATION
- A/C COMPRESSOR REMOVAL/INSTALLATION
- CONDENSER REMOVAL/INSTALLATION
- CONDENSER INSPECTION
- REFRIGERANT LINE REMOVAL/INSTALLATION

## Control System

- HVAC CONTROL SYSTEM LOCATION INDEX
- AIR INTAKE ACTUATOR REMOVAL/INSTALLATION

- AIR MIX ACTUATOR REMOVAL/INSTALLATION
- AIRFLOW MODE ACTUATOR REMOVAL/INSTALLATION
- BLOWER MOTOR REMOVAL/INSTALLATION
- BLOWER MOTOR INSPECTION
- POWER METAL OXIDE SEMICONDUCTOR FIELD EFFECT TRANSISTOR (POWER MOS FET) REMOVAL/INSTALLATION
- POWER METAL OXIDE SEMICONDUCTOR FIELD EFFECT TRANSISTOR (POWER MOS FET) INSPECTION
- MAGNETIC CLUTCH DISASSEMBLY/ASSEMBLY
- MAGNETIC CLUTCH ADJUSTMENT
- MAGNETIC CLUTCH INSPECTION
- EVAPORATOR TEMPERATURE SENSOR REMOVAL/INSTALLATION
- EVAPORATOR TEMPERATURE SENSOR INSPECTION
- REFRIGERANT PRESSURE SWITCH REMOVAL/INSTALLATION
- REFRIGERANT PRESSURE SWITCH INSPECTION
- CLIMATE CONTROL UNIT REMOVAL/INSTALLATION
- CLIMATE CONTROL UNIT DISASSEMBLY/ASSEMBLY
- CLIMATE CONTROL UNIT INSPECTION

### Technical Data

- HVAC TECHNICAL DATA

### Maintenance/Service Tools

- HVAC SST

# Workshop Manual - Restraints

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## On-Board Diagnostics

- FOREWORD
- AIR BAG SYSTEM WIRING DIAGRAM (ON-BOARD DIAGNOSTIC)
- DTC DISPLAY
- CLEARING DTC
- DTC TABLE
- PID/DATA MONITOR DISPLAY
- PID/DATA MONITOR TABLE
- DTC B1013
- DTC B1047, B1992, B1993, B1994, B1995
- DTC B104B, B1051, B2887, U2017
- DTC B104C, B104F, B2886, U2018
- DTC B104D, B2226, B2227, B2856
- DTC B1055, B1996, B1997, B1998, B1999
- DTC B1318
- DTC B1342
- DTC B1428
- DTC B1869
- DTC B1871
- DTC B1877, B1878, B1879, B1885
- DTC B1881, B1882, B1883, B1886
- DTC B1884
- DTC B1916, B1932, B1934, B1936
- DTC B1925, B1933, B1935, B1938
- DTC B2228, B2230, B2232, B2234
- DTC B2229, B2231, B2233, B2235
- DTC B2290
- DTC B2433, B2434
- DTC B2437, B2438
- DTC B2477
- DTC B2867
- DTC C1946, C1947, C1948, C1982

## Symptom Troubleshooting

- TROUBLESHOOTING INDEX
- NO.1 AIR BAG SYSTEM WARNING LIGHT DOES NOT ILLUMINATE
- NO.2 AIR BAG SYSTEM WARNING LIGHT ILLUMINATES CONSTANTLY

## Air Bag System

- LOCATION INDEX

- AIR BAG SYSTEM SERVICE WARNINGS
- AIR BAG SYSTEM SERVICE CAUTIONS
- DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION
- PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION
- SIDE AIR BAG MODULE REMOVAL/INSTALLATION
- CRASH ZONE SENSOR REMOVAL/INSTALLATION
- SAS CONTROL MODULE REMOVAL/INSTALLATION
- SAS CONTROL MODULE CONFIGURATION
- SEAT TRACK POSITION SENSOR REMOVAL/INSTALLATION
- SEAT WEIGHT SENSOR CONTROL MODULE REMOVAL/INSTALLATION
- SEAT WEIGHT SENSOR CALIBRATION
- SEAT WEIGHT SENSOR INSPECTION
- SIDE AIR BAG SENSOR REMOVAL/INSTALLATION
- CLOCK SPRING REMOVAL/INSTALLATION
- CLOCK SPRING ADJUSTMENT
- CLOCK SPRING INSPECTION
- PASSENGER AIR BAG DEACTIVATION (PAD) SWITCH REMOVAL/INSTALLATION
- PASSENGER AIR BAG DEACTIVATION (PAD) SWITCH INSPECTION
- PASSENGER AIR BAG DEACTIVATION (PAD) INDICATOR REMOVAL/INSTALLATION
- AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DEPLOYMENT PROCEDURES
- AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DISPOSAL PROCEDURES
- INSPECTION OF SST (DEPLOYMENT TOOL)

## Seat Belt

- LOCATION INDEX
- SEAT BELT REMOVAL/INSTALLATION
- SEAT BELT INSPECTION
- BUCKLE REMOVAL/INSTALLATION
- BUCKLE SWITCH INSPECTION

## Maintenance/Service Tools

- RESTRAINTS SST

## Workshop Manual - Body and Accessories

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### ON-BOARD DIAGNOSTIC

- FOREWORD [ADVANCED KEYLESS SYSTEM]
- DTC INSPECTION [ADVANCED KEYLESS SYSTEM]
- DTC TABLE [ADVANCED KEYLESS SYSTEM]
- CLEARING DTC [ADVANCED KEYLESS SYSTEM]
- PID/DATA MONITOR INSPECTION [ADVANCED KEYLESS SYSTEM]
- PID/DATA MONITOR TABLE [ADVANCED KEYLESS SYSTEM]
- DTC B1093 [ADVANCED KEYLESS SYSTEM]
- DTC B112A [ADVANCED KEYLESS SYSTEM]
- DTC B1126 [ADVANCED KEYLESS SYSTEM]
- DTC B1127 [ADVANCED KEYLESS SYSTEM]
- DTC B1128 [ADVANCED KEYLESS SYSTEM]
- DTC B1129 [ADVANCED KEYLESS SYSTEM]
- DTC B1131 [ADVANCED KEYLESS SYSTEM]
- DTC B1132 [ADVANCED KEYLESS SYSTEM]
- DTC B1133 [ADVANCED KEYLESS SYSTEM]
- DTC B1134 [ADVANCED KEYLESS SYSTEM]
- DTC B1317/B1318 [ADVANCED KEYLESS SYSTEM]
- DTC B1342 [ADVANCED KEYLESS SYSTEM]
- DTC B2170 [ADVANCED KEYLESS SYSTEM]
- DTC B2477 [ADVANCED KEYLESS SYSTEM]
- DTC U0214 [ADVANCED KEYLESS SYSTEM]
- DTC U0236 [ADVANCED KEYLESS SYSTEM]

### ON-BOARD DIAGNOSTIC

- FOREWORD [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]
- DTC INSPECTION [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]
- DTC TABLE [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]
- CLEARING DTC [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]
- PID/DATA MONITOR INSPECTION [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]
- PID/DATA MONITOR TABLE [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]
- SECURITY LIGHT -, DTC B1213/-/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]
- SECURITY LIGHT 11, DTC B1681/B1681/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]
- SECURITY LIGHT 11, DTC -/B1681/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]
- SECURITY LIGHT 12, DTC B2103/B2103/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]
- SECURITY LIGHT 13, DTC -/B1600/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]
- SECURITY LIGHT 13, DTC -/B2431/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]
- SECURITY LIGHT 14, DTC -/B1602/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]
- SECURITY LIGHT 15, DTC -/B1601/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]
- SECURITY LIGHT 15, DTC B1342/B1601/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]



- SECURITY LIGHT 16, DTC -/U2510/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]
- SECURITY LIGHT 21, DTC B1213/B1213/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]
- SECURITY LIGHT 22, DTC -/B2141/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]
- SECURITY LIGHT 23, DTC -/B2139/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]

## ON-BOARD DIAGNOSTIC

- FOREWORD [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]
- DTC INSPECTION [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]
- DTC TABLE [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]
- CLEARING DTC [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]
- PID/DATA MONITOR INSPECTION [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]
- PID/DATA MONITOR TABLE [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]
- SECURITY LIGHT 11, DTC B1681/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]
- SECURITY LIGHT 12, DTC B2103/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]
- SECURITY LIGHT 13, DTC B1600/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]
- SECURITY LIGHT 13, DTC B2431/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]
- SECURITY LIGHT 14, DTC B1602/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]
- SECURITY LIGHT 15, DTC B1601/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]
- SECURITY LIGHT 16, DTC U2510/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]
- SECURITY LIGHT 21, DTC B1213/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]
- SECURITY LIGHT 22, DTC B2141/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]
- SECURITY LIGHT 23, DTC B2139/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]
- DTC B1342 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]

## ON-BOARD DIAGNOSTIC

- DTC TABLE [MULTIPLEX COMMUNICATION SYSTEM]
- MULTIPLEX COMMUNICATION SYSTEM [MULTIPLEX COMMUNICATION SYSTEM]
- PROCEDURES FOR DETERMINING THE LOCATION OF A MALFUNCTION [MULTIPLEX COMMUNICATION SYSTEM]
- DTC U0073, U2516 [MULTIPLEX COMMUNICATION SYSTEM]

## ON-BOARD DIAGNOSTIC

- DTC INSPECTION [INSTRUMENT CLUSTER]
- DTC TABLE [INSTRUMENT CLUSTER]
- CLEARING DTC [INSTRUMENT CLUSTER]
- PID/DATA MONITOR INSPECTION [INSTRUMENT CLUSTER]
- PID/DATA MONITOR TABLE [INSTRUMENT CLUSTER]
- DTC B1342 [INSTRUMENT CLUSTER]
- DTC B2477 [INSTRUMENT CLUSTER]

## ON-BOARD DIAGNOSTIC

- DTC TABLE [AUDIO]
- STARTING PROCEDURE FOR ON-BOARD DIAGNOSTIC TEST MODE [AUDIO]
- SUPPLIER IDENTIFICATION PROCEDURE [AUDIO]
- MEMORY CLEARING PROCEDURE [AUDIO]
- DIAGNOSTIC ASSIST FUNCTION [AUDIO]

## ON-BOARD DIAGNOSTIC

- DTC INSPECTION [POWER RETRACTABLE HARDTOP]
- DTC TABLE [POWER RETRACTABLE HARDTOP]
- CLEARING DTC [POWER RETRACTABLE HARDTOP]
- PID/DATA MONITOR INSPECTION [POWER RETRACTABLE HARDTOP]
- PID/DATA MONITOR TABLE [POWER RETRACTABLE HARDTOP]
- DTC B1317/B1318 [POWER RETRACTABLE HARDTOP]
- DTC B1342 [POWER RETRACTABLE HARDTOP]

- DTC B293E/B293D/B294C/B293F [POWER RETRACTABLE HARDTOP]
- DTC B294D/B294E [POWER RETRACTABLE HARDTOP]
- DTC B294F [POWER RETRACTABLE HARDTOP]
- DTC U0030/U0031 [POWER RETRACTABLE HARDTOP]
- DTC B296A/U294B/B293C/B293B [POWER RETRACTABLE HARDTOP]
- DTC B296B [POWER RETRACTABLE HARDTOP]
- DTC B296D [POWER RETRACTABLE HARDTOP]
- DTC B296C [POWER RETRACTABLE HARDTOP]

## SYMPTOM TROUBLESHOOTING

- FOREWORD [POWER WINDOW SYSTEM]
- POWER WINDOW SYSTEM TROUBLESHOOTING QUESTIONNAIRE [POWER WINDOW SYSTEM]
- SYMPTOM TROUBLESHOOTING CHART [POWER WINDOW SYSTEM]
- POWER WINDOW SYSTEM WIRING DIAGRAM [POWER WINDOW SYSTEM]
- POWER WINDOW SYSTEM PRELIMINARY INSPECTION [POWER WINDOW SYSTEM]
- No.1 THE AUTO OPEN FUNCTION ON THE DRIVER'S AND PASSENGER'S SIDE POWER WINDOW IS INOPERATIVE [POWER WINDOW SYSTEM]
- No.2 THE DRIVER'S SIDE POWER WINDOW IS INOPERATIVE [POWER WINDOW SYSTEM]
- No.3 THE PASSENGER'S SIDE POWER WINDOW IS INOPERATIVE [POWER WINDOW SYSTEM]
- No.4 ALL POWER WINDOWS ARE INOPERATIVE [POWER WINDOW SYSTEM]
- No.5 ABNORMAL NOISE WHILE THE DOOR GLASS IS OPENING OR CLOSING [POWER WINDOW SYSTEM]

## SYMPTOM TROUBLESHOOTING

- FOREWORD [ADVANCED KEYLESS SYSTEM]
- SYMPTOM TROUBLESHOOTING CHART [ADVANCED KEYLESS SYSTEM]
- KEYLESS ENTRY SYSTEM WIRING DIAGRAM [ADVANCED KEYLESS SYSTEM]
- NO.1 DOOR CANNOT BE LOCKED/UNLOCKED BY TRANSMITTER (CARD KEY) [ADVANCED KEYLESS SYSTEM]
- NO.2 BLINK KEYLESS INDICATOR LIGHT [ADVANCED KEYLESS SYSTEM]
- NO.3 ADVANCED KEYLESS ENTRY FUNCTION INOPERATIVE [ADVANCED KEYLESS SYSTEM]
- NO.4 ADVANCED KEYLESS START FUNCTION INOPERATIVE [ADVANCED KEYLESS SYSTEM]

## SYMPTOM TROUBLESHOOTING

- SYMPTOM TROUBLESHOOTING CHART [KEYLESS ENTRY SYSTEM]
- KEYLESS ENTRY SYSTEM ON-BOARD DIAGNOSIS [KEYLESS ENTRY SYSTEM]
- KEYLESS ENTRY SYSTEM PRELIMINARY INSPECTION [KEYLESS ENTRY SYSTEM]
- KEYLESS ENTRY SYSTEM WIRING DIAGRAM [KEYLESS ENTRY SYSTEM]
- NO.1 ONE OR MORE ON-BOARD DIAGNOSTIC FUNCTIONS INOPERATIVE [KEYLESS ENTRY SYSTEM]
- NO.2 ALL ON-BOARD DIAGNOSTIC FUNCTIONS INOPERATIVE [KEYLESS ENTRY SYSTEM]
- NO.3 TRANSMITTER ID CODE CANNOT BE REPROGRAMMED [KEYLESS ENTRY SYSTEM]

## SYMPTOM TROUBLESHOOTING

- SYMPTOM TROUBLESHOOTING [INSTRUMENT CLUSTER]
- QUICK DIAGNOSTIC CHART [INSTRUMENT CLUSTER]
- NO. 1 FUEL GAUGE NEEDLE POSITION INCORRECT [INSTRUMENT CLUSTER]
- NO. 2 ALL METERS AND GAUGES DO NOT OPERATE [INSTRUMENT CLUSTER]
- NO. 3 ABS WARNING LIGHT ILLUMINATES [INSTRUMENT CLUSTER]
- NO. 4 MIL ILLUMINATES [INSTRUMENT CLUSTER]
- NO. 5 BRAKE SYSTEM WARNING LIGHT ILLUMINATES [INSTRUMENT CLUSTER]
- NO. 6 INSTRUMENT CLUSTER ILLUMINATION DOES NOT ILLUMINATE [INSTRUMENT CLUSTER]
- NO. 7 SPEEDOMETER INDICATION IS DEFECTIVE [INSTRUMENT CLUSTER]
- NO. 8 TACHOMETER INDICATION IS DEFECTIVE [INSTRUMENT CLUSTER]
- NO. 9 WATER TEMPERATURE GAUGE INDICATION IS DEFECTIVE [INSTRUMENT CLUSTER]
- NO. 10 OIL PRESSURE GAUGE INDICATION IS DEFECTIVE (OIL PRESSURE GAUGE NEEDLE DOES NOT MOVE FROM THE L POSITION OR LESS) [INSTRUMENT CLUSTER]

## SYMPTOM TROUBLESHOOTING

- FOREWORD [AUDIO]
- CONFIRMATION STEP 1: AUDIO PANEL SWITCH CONFIRMATION [AUDIO]
- CONFIRMATION STEP 2: AUDIO CONTROL SWITCH CONFIRMATION [AUDIO]
- NO.1 AF NOISE OR POP NOISE AT ALL SOURCES (RADIO, CD) [AUDIO]
- NO.2 NO POWER TO THE ENTIRE AUDIO SYSTEM [AUDIO]
- NO.3 NO SOUND FROM ALL SPEAKERS (VEHICLES WITH Bose) [AUDIO]
- NO.3 NO SOUND FROM ALL SPEAKERS (VEHICLES WITHOUT Bose) [AUDIO]
- NO.4 NO SOUND FROM SOME SPEAKERS (VEHICLES WITH Bose) [AUDIO]
- NO.4 NO SOUND FROM SOME SPEAKERS (VEHICLES WITHOUT Bose) [AUDIO]
- NO.5 SOUND BREAK-UP OR POOR SOUND QUALITY [AUDIO]
- NO.6 VOLUME INCREASES/DECREASES WHILE DRIVING THE VEHICLE [AUDIO]
- NO.7 ALC FUNCTION IS INOPERATIVE [AUDIO]
- NO.8 AUDIO PILOT FUNCTION IS INOPERATIVE [AUDIO]
- NO.9 NO AUDIO SYSTEM ILLUMINATION [AUDIO]
- FOREWORD [AUDIO]
- CONFIRMATION STEP 1: RECEPTION CONDITION SYMPTOM (EXAMPLE) [AUDIO]
- CONFIRMATION STEP 2: ANTENNA SYSTEM SYMPTOM (EXAMPLE) [AUDIO]
- CONFIRMATION STEP 3: ANTENNA SYSTEM SIMPLE INSPECTION [AUDIO]
- NO.1 NO RADIO RECEPTION (AM/FM)/NO OR LOW VOLUME [AUDIO]
- NO.2 NOISE FROM RADIO (AM ONLY) [AUDIO]
- NO.3 NOISE FROM RADIO (FM ONLY) [AUDIO]
- NO.4 CANNOT TUNE (SEEK DOES NOT STOP) [AUDIO]
- NO.5 CANNOT PRESET (PRESET FUNCTION DOES NOT OPERATE) [AUDIO]
- NO.6 RECEPTION FREQUENCY OF RADIO SLIPS [AUDIO]
- FOREWORD [AUDIO]
- NO.1 CD PLAYER/CHANGER DOES NOT LOAD THE CD OR EJECTS THE CD IMMEDIATELY [AUDIO]
- NO.2 CD PLAYER/CHANGER DOES NOT EJECT THE CD [AUDIO]
- NO.3 CD PLAYER/CHANGER DOES NOT PLAY THE CD/NO SOUND [AUDIO]
- NO.4 SOUND JUMPS [AUDIO]
- NO.5 SCRATCHES ON THE CD [AUDIO]
- NO.6 DISC CHANGE IS INOPERATIVE [AUDIO]
- NO.7 CD PLAYER DOES NOT PLAY THE MP3-FORMATTED FILE [AUDIO]
- NO.8 MP3-FORMATTED FILE FOLDER SELECTION IS INOPERATIVE/TRACK SEARCH IS INOPERATIVE [AUDIO]
- NO.9 CD PLAYER DOES NOT INDICATE THE MP3 TITLE TEXT [AUDIO]
- NO.10 CD PLAYER DOES NOT PLAY THE AUDIO DATA (CDDA) [AUDIO]
- NO.11 TRACK CHANGE IS INOPERATIVE [AUDIO]
- RADIO [AUDIO]
- AUDIO CD [AUDIO]
- DTC TABLE [AUDIO]

## SYMPTOM TROUBLESHOOTING

- TROUBLESHOOTING INDEX [IMMOBILIZER SYSTEM]
- NO.1 SECURITY LIGHT DISPLAY IS NOT NORMAL [IMMOBILIZER SYSTEM]

## SYMPTOM TROUBLESHOOTING

- SYMPTOM TROUBLESHOOTING CHART [EXTERIOR OPEN FUNCTION]
- QUICK DIAGNOSTIC CHART [EXTERIOR OPEN FUNCTION]
- No.1 DOOR GLASS DOES NOT OPERATE EVEN THOUGH VARIOUS OPERATIONS ARE PERFORMED [EXTERIOR OPEN FUNCTION]
- No.2 DOOR GLASS DOES NOT OPERATE USING THE KEYLESS TRANSMITTER [EXTERIOR OPEN FUNCTION]
- No.3 SOME DOOR GLASS DO NOT OPERATE [EXTERIOR OPEN FUNCTION]
- No.4 DOOR GLASS STOPS BEFORE FULLY OPENING [EXTERIOR OPEN FUNCTION]
- No.5 ALL DOOR GLASSES OPERATE ACCIDENTALLY [EXTERIOR OPEN FUNCTION]

## SYMPTOM TROUBLESHOOTING

- SYMPTOM TROUBLESHOOTING INDEX [POWER RETRACTABLE HARDTOP]
- NO. 1 POWER RETRACTABLE HARDTOP WARNING BUZZER SOUNDS CONTINUOUSLY [POWER RETRACTABLE HARDTOP]
- NO. 2 POWER RETRACTABLE HARDTOP INDICATOR LIGHT FLASHING [POWER RETRACTABLE HARDTOP]
- NO. 3 POWER RETRACTABLE HARDTOP DOES NOT START TO OPEN [POWER RETRACTABLE HARDTOP]
- NO. 4 POWER RETRACTABLE HARDTOP DOES NOT START TO CLOSE [POWER RETRACTABLE HARDTOP]
- NO. 5 POWER RETRACTABLE HARDTOP STOPS WHILE OPERATING [POWER RETRACTABLE HARDTOP]

## BODY PANELS

- BODY PANELS LOCATION INDEX
- HOOD REMOVAL/INSTALLATION
- HOOD ADJUSTMENT
- TRUNK LID REMOVAL/INSTALLATION
- TRUNK LID ADJUSTMENT
- STAY DAMPER DISPOSAL
- FUEL-FILLER LID REMOVAL/INSTALLATION
- FUEL-FILLER LID ADJUSTMENT
- FRONT BUMPER REMOVAL/INSTALLATION
- FRONT BUMPER DISASSEMBLY/ASSEMBLY
- FRONT BUMPER REINFORCEMENT REMOVAL/INSTALLATION
- REAR BUMPER REMOVAL/INSTALLATION
- REAR BUMPER REINFORCEMENT REMOVAL/INSTALLATION
- FRONT FENDER PANEL REMOVAL/INSTALLATION
- SEAT BACK CROSSMEMBER ASSEMBLY REMOVAL/INSTALLATION

## DOORS AND LIFTGATE

- DOORS LOCATION INDEX
- FRONT DOOR REMOVAL/INSTALLATION
- DOOR ADJUSTMENT
- DOOR UNIT REMOVAL/INSTALLATION

## GLASS/WINDOWS/MIRRORS

- GLASS/WINDOWS/MIRRORS LOCATION INDEX
- DOOR GLASS REMOVAL/INSTALLATION
- DOOR GLASS ADJUSTMENT
- DOOR QUARTER GLASS REMOVAL/INSTALLATION
- POWER WINDOW REGULATOR REMOVAL/INSTALLATION
- POWER WINDOW REGULATOR DISASSEMBLY/ASSEMBLY
- POWER WINDOW MOTOR INSPECTION
- POWER WINDOW MAIN SWITCH REMOVAL/INSTALLATION
- POWER WINDOW MAIN SWITCH INSPECTION
- POWER WINDOW MAIN SWITCH INSPECTION [POWER RETRACTABLE HARDTOP]
- WINDSHIELD REMOVAL
- WINDSHIELD INSTALLATION
- REAR WINDOW GLASS REMOVAL [DETACHABLE HARDTOP]
- REAR WINDOW GLASS INSTALLATION [DETACHABLE HARDTOP]
- REAR WINDOW GLASS REMOVAL/INSTALLATION [POWER RETRACTABLE HARDTOP]
- REAR WINDOW DEFROSTER FILAMENT INSPECTION
- REAR WINDOW DEFROSTER FILAMENT REPAIR
- POWER OUTER MIRROR REMOVAL/INSTALLATION
- POWER OUTER MIRROR DISASSEMBLY/ASSEMBLY
- POWER OUTER MIRROR INSPECTION
- POWER OUTER MIRROR SWITCH REMOVAL/INSTALLATION

## POWER OUTER MIRROR SWITCH INSPECTION

- BASE REMOVAL
- BASE INSTALLATION
- REARVIEW MIRROR REMOVAL/INSTALLATION

## SEATS

- SEAT LOCATION INDEX
- SEAT REMOVAL/INSTALLATION
- SEAT DISASSEMBLY/ASSEMBLY
- SEAT WARMER SWITCH REMOVAL/INSTALLATION
- SEAT WARMER SWITCH INSPECTION
- SEAT WARMER UNIT INSPECTION

## SECURITY AND LOCKS

- POWER DOOR LOCK SYSTEM AND KEYLESS ENTRY SYSTEM LOCATION INDEX [ADVANCED KEYLESS SYSTEM]
- THEFT-DETERRENT SYSTEM LOCATION INDEX [ADVANCED KEYLESS SYSTEM]
- IMMOBILIZER SYSTEM LOCATION INDEX [ADVANCED KEYLESS SYSTEM]
- OUTER HANDLE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]
- INNER HANDLE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]
- OPEN HOOK REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]
- HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]
- HOOD STRIKER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]
- HOOD LATCH SWITCH INSPECTION [ADVANCED KEYLESS SYSTEM]
- DOOR KEY CYLINDER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]
- DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]
- DOOR LOCK ACTUATOR INSPECTION [ADVANCED KEYLESS SYSTEM]
- DOOR LOCK STRIKER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]
- DOOR LOCK SWITCH REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]
- DOOR LOCK SWITCH INSPECTION [ADVANCED KEYLESS SYSTEM]
- FUEL-FILLER LID OPENER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]
- TRUNK LID OPENER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]
- TRUNK LID OPENER INSPECTION [ADVANCED KEYLESS SYSTEM]
- TRUNK LID OPENER SWITCH REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]
- TRUNK LID OPENER SWITCH INSPECTION [ADVANCED KEYLESS SYSTEM]
- TRUNK LID STRIKER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]
- TRUNK KEY CYLINDER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]
- TRUNK KEY CYLINDER SWITCH INSPECTION [ADVANCED KEYLESS SYSTEM]
- TRUNK LID OPEN CANCEL SWITCH REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]
- TRUNK LID OPEN CANCEL SWITCH INSPECTION [ADVANCED KEYLESS SYSTEM]
- TOP LOCK SWITCH INSPECTION [ADVANCED KEYLESS SYSTEM]
- KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]
- KEYLESS CONTROL MODULE INSPECTION [ADVANCED KEYLESS SYSTEM]
- CARD KEY ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]
- CLEARING CARD KEY [ADVANCED KEYLESS SYSTEM]
- STEERING LOCK UNIT ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]
- KEYLESS CONTROL MODULE CONFIGURATION [ADVANCED KEYLESS SYSTEM]
- CUSTOMIZED FUNCTION SETTING PROCEDURE [ADVANCED KEYLESS SYSTEM]
- KEYLESS RECEIVER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]
- KEYLESS RECEIVER INSPECTION [ADVANCED KEYLESS SYSTEM]
- KEYLESS ANTENNA REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]
- KEYLESS BEEPER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]
- REQUEST SWITCH REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]
- REQUEST SWITCH INSPECTION [ADVANCED KEYLESS SYSTEM]
- CARD KEY BATTERY REPLACEMENT [ADVANCED KEYLESS SYSTEM]
- COIL ANTENNA REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]
- IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]

## SYSTEM]

- SECURITY ACCESS PROCEDURE [ADVANCED KEYLESS SYSTEM]

## SECURITY AND LOCKS

- POWER DOOR LOCK SYSTEM AND KEYLESS ENTRY SYSTEM LOCATION INDEX [KEYLESS ENTRY SYSTEM]
- THEFT-DETERRENT SYSTEM LOCATION INDEX [KEYLESS ENTRY SYSTEM]
- IMMOBILIZER SYSTEM LOCATION INDEX [KEYLESS ENTRY SYSTEM]
- KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [KEYLESS ENTRY SYSTEM]
- KEYLESS CONTROL MODULE INSPECTION [KEYLESS ENTRY SYSTEM]
- TRANSMITTER BATTERY REPLACEMENT [KEYLESS ENTRY SYSTEM]
- TRANSMITTER ID CODE REGISTRATION [KEYLESS ENTRY SYSTEM]
- KEYLESS RECEIVER INSPECTION [KEYLESS ENTRY SYSTEM]
- COIL ANTENNA REMOVAL/INSTALLATION [KEYLESS ENTRY SYSTEM]
- IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]

## EXTERIOR TRIM

- EXTERIOR TRIM LOCATION INDEX
- COWL GRILLE REMOVAL/INSTALLATION
- SIDE COWL GRILLE REMOVAL/INSTALLATION
- BELTLINE MOLDING REMOVAL/INSTALLATION
- FRONT BELTLINE MOLDING REMOVAL/INSTALLATION
- DRIP MOLDING REMOVAL/INSTALLATION
- WINDSHIELD GARNISH REMOVAL
- WINDSHIELD GARNISH INSTALLATION
- CONVERTIBLE TOP REMOVAL/INSTALLATION
- CONVERTIBLE TOP DISASSEMBLY/ASSEMBLY
- CONVERTIBLE TOP ADJUSTMENT
- DETACHABLE HARDTOP DISASSEMBLY/ASSEMBLY
- DETACHABLE HARDTOP ADJUSTMENT
- DRAIN COVER REMOVAL/INSTALLATION
- FRONT UNDER COVER REMOVAL/INSTALLATION
- SPLASH SHIELD REMOVAL/INSTALLATION
- POWER RETRACTABLE HARDTOP REMOVAL/INSTALLATION
- POWER RETRACTABLE HARDTOP ADJUSTMENT
- POWER RETRACTABLE HARDTOP SWITCH REMOVAL/INSTALLATION
- POWER RETRACTABLE HARDTOP SWITCH INSPECTION
- POWER RETRACTABLE HARDTOP CONTROL MODULE REMOVAL/INSTALLATION
- POWER RETRACTABLE HARDTOP CONTROL MODULE INSPECTION
- POWER RETRACTABLE HARDTOP CONTROL MODULE BRACKET REMOVAL/INSTALLATION
- ROOF MOTOR INSPECTION
- ROOF MOTOR REMOVAL/INSTALLATION
- POWER RETRACTABLE HARDTOP LIMIT SWITCH REMOVAL/INSTALLATION
- POWER RETRACTABLE HARDTOP LIMIT SWITCH INSPECTION
- DECK PANEL REMOVAL/INSTALLATION
- DECK PANEL DISASSEMBLY/ASSEMBLY
- DECK PANEL ADJUSTMENT
- DECK PANEL MOTOR REMOVAL/INSTALLATION
- DECK PANEL MOTOR INSPECTION
- DECK PANEL LIMIT SWITCH REMOVAL/INSTALLATION
- DECK PANEL LIMIT SWITCH INSPECTION
- REAR DECK WEATHERSTRIP REMOVAL
- REAR DECK WEATHERSTRIP INSTALLATION
- ROOF HOOK REMOVAL/INSTALLATION
- ROOF HOOK CABLE REMOVAL/INSTALLATION
- POWER RETRACTABLE HARDTOP LINK BRACKET REMOVAL/INSTALLATION
- FRONT ROOF PANEL REMOVAL/INSTALLATION



- FRONT ROOF PANEL DISASSEMBLY/ASSEMBLY
- MIDDLE ROOF PANEL REMOVAL/INSTALLATION
- MIDDLE ROOF PANEL DISASSEMBLY/ASSEMBLY
- MIDDLE ROOF PANEL WEATHERSTRIP REMOVAL/INSTALLATION
- ROOF LINK REMOVAL/INSTALLATION
- BLACK-OUT FILM REMOVAL
- BLACK-OUT FILM INSTALLATION
- POWER RETRACTABLE HARDTOP DRAIN HOSE REMOVAL/INSTALLATION
- DECK PANEL MANUAL OPEN/CLOSE PROCEDURE
- POWER RETRACTABLE HARDTOP OPEN/CLOSE WARNING BEEP ON/OFF SWITCHING
- SIDE STEP MOLDING REMOVAL
- SIDE STEP MOLDING INSTALLATION
- EXTRACTOR CHAMBER REMOVAL/INSTALLATION

## INTERIOR TRIM

- INTERIOR TRIM LOCATION INDEX
- DASHBOARD REMOVAL/INSTALLATION
- DASHBOARD DISASSEMBLY/ASSEMBLY
- COLUMN COVER REMOVAL/INSTALLATION
- LOWER PANEL REMOVAL/INSTALLATION
- SIDE PANEL REMOVAL/INSTALLATION
- METER HOOD REMOVAL/INSTALLATION
- GLOVE COMPARTMENT REMOVAL/INSTALLATION
- VENTILATOR GRILLE REMOVAL/INSTALLATION
- KNEE BOLSTER REMOVAL/INSTALLATION
- SIDE WALL REMOVAL/INSTALLATION
- CONSOLE REMOVAL/INSTALLATION
- CONSOLE DISASSEMBLY/ASSEMBLY
- CONSOLE PANEL REMOVAL/INSTALLATION
- DECORATION PANEL REMOVAL/INSTALLATION
- A-PILLAR TRIM REMOVAL/INSTALLATION
- FRONT HEADER TRIM REMOVAL/INSTALLATION
- FRONT SIDE TRIM REMOVAL/INSTALLATION
- SCUFF PLATE REMOVAL/INSTALLATION
- TIRE HOUSE TRIM REMOVAL/INSTALLATION
- QUARTER TRIM REMOVAL/INSTALLATION
- DOOR TRIM REMOVAL/INSTALLATION
- DOOR TRIM DISASSEMBLY/ASSEMBLY
- AEROBOARD REMOVAL/INSTALLATION
- SEAT BACK BAR GARNISH REMOVAL/INSTALLATION
- BACK TRIM REMOVAL/INSTALLATION
- SEAT BACK BAR LOWER GARNISH REMOVAL/INSTALLATION
- REAR PACKAGE TRIM REMOVAL/INSTALLATION
- REAR SIDE TRIM REMOVAL/INSTALLATION
- SIDE SHELF REMOVAL/INSTALLATION
- B-PILLAR UPPER TRIM REMOVAL [DETACHABLE HARDTOP]
- B-PILLAR UPPER TRIM INSTALLATION [DETACHABLE HARDTOP]
- REAR TRIM REMOVAL [DETACHABLE HARDTOP]
- REAR TRIM INSTALLATION [DETACHABLE HARDTOP]
- TRUNK END TRIM REMOVAL/INSTALLATION
- TRUNK SIDE TRIM REMOVAL/INSTALLATION
- PARTITION BOARD REMOVAL/INSTALLATION
- TRUNK MAT REMOVAL/INSTALLATION
- HEADLINER REMOVAL/INSTALLATION [DETACHABLE HARDTOP]
- SHOCK ABSORBING PAD REMOVAL/INSTALLATION [DETACHABLE HARDTOP]
- FLOOR COVERING REMOVAL/INSTALLATION

## SUNVISOR REMOVAL/INSTALLATION

### LIGHTING SYSTEMS

- LIGHTING SYSTEMS LOCATION INDEX
- DISCHARGE HEADLIGHT SERVICE WARNINGS
- FRONT COMBINATION LIGHT REMOVAL/INSTALLATION
- HEADLIGHT AIMING
- HEADLIGHT BULB REMOVAL/INSTALLATION
- DISCHARGE HEADLIGHT CONTROL MODULE REMOVAL/INSTALLATION
- DISCHARGE HEADLIGHT SYSTEM INSPECTION
- PARKING LIGHT BULB REMOVAL/INSTALLATION
- FRONT SIDE MARKER LIGHT REMOVAL/INSTALLATION
- FRONT TURN LIGHT BULB REMOVAL/INSTALLATION
- FRONT FOG LIGHT REMOVAL/INSTALLATION
- FRONT FOG LIGHT AIMING
- FRONT FOG LIGHT BULB REMOVAL/INSTALLATION
- REAR COMBINATION LIGHT REMOVAL/INSTALLATION
- HIGH-MOUNT BRAKE LIGHT REMOVAL/INSTALLATION
- LICENSE PLATE LIGHT REMOVAL/INSTALLATION
- BACK-UP LIGHT SWITCH REMOVAL/INSTALLATION
- BACK-UP LIGHT SWITCH INSPECTION
- COMBINATION SWITCH REMOVAL/INSTALLATION
- COMBINATION SWITCH DISASSEMBLY/ASSEMBLY
- LIGHT SWITCH REMOVAL/INSTALLATION
- LIGHT SWITCH INSPECTION
- FRONT FOG LIGHT SWITCH INSPECTION
- HAZARD WARNING SWITCH REMOVAL/INSTALLATION
- HAZARD WARNING SWITCH INSPECTION
- FLASHER CONTROL MODULE REMOVAL/INSTALLATION
- FLASHER CONTROL MODULE INSPECTION
- DRL SYSTEM WIRING DIAGRAM
- DRL CONTROL MODULE REMOVAL/INSTALLATION
- DRL CONTROL MODULE INSPECTION
- MAP LIGHT REMOVAL/INSTALLATION
- MAP LIGHT INSPECTION
- TRUNK COMPARTMENT LIGHT REMOVAL/INSTALLATION
- TRUNK COMPARTMENT LIGHT INSPECTION
- IGNITION KEY ILLUMINATION BULB REMOVAL/INSTALLATION
- DOOR SWITCH REMOVAL/INSTALLATION
- DOOR SWITCH INSPECTION

### WIPER/WASHER SYSTEM

- WIPER/WASHER SYSTEM LOCATION INDEX
- WIPER ARM AND BLADE REMOVAL/INSTALLATION
- WIPER ARM AND BLADE ADJUSTMENT
- WIPER MOTOR REMOVAL/INSTALLATION
- WIPER MOTOR DISASSEMBLY/ASSEMBLY
- WIPER MOTOR INSPECTION
- WASHER TANK REMOVAL/INSTALLATION
- WASHER MOTOR REMOVAL/INSTALLATION
- WASHER MOTOR INSPECTION
- WASHER NOZZLE REMOVAL/INSTALLATION
- WASHER HOSE REMOVAL/INSTALLATION
- WIPER AND WASHER SWITCH REMOVAL/INSTALLATION
- WIPER AND WASHER SWITCH INSPECTION



## ENTERTAINMENT

- ENTERTAINMENT LOCATION INDEX
- CENTER PANEL UNIT REMOVAL/INSTALLATION
- CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY
- AUDIO UNIT DISASSEMBLY/ASSEMBLY
- AUDIO AMPLIFIER REMOVAL/INSTALLATION
- DOOR SPEAKER REMOVAL/INSTALLATION
- DOOR SPEAKER INSPECTION
- DOOR UPPER SPEAKER INSPECTION
- TWEETER REMOVAL/INSTALLATION
- TWEETER INSPECTION
- REAR SPEAKER REMOVAL/INSTALLATION
- REAR SPEAKER INSPECTION
- CENTER SPEAKER REMOVAL/INSTALLATION
- CENTER SPEAKER INSPECTION
- CONDENSER REMOVAL/INSTALLATION
- AUDIOPILOT MICROPHONE REMOVAL/INSTALLATION
- MANUAL ANTENNA REMOVAL/INSTALLATION
- MANUAL ANTENNA INSPECTION
- ANTENNA FEEDER LOCATION
- AM/FM ANTENNA FEEDER NO.2 INSPECTION
- AM/FM ANTENNA FEEDER NO.1 INSPECTION
- AUDIO CONTROL SWITCH REMOVAL/INSTALLATION
- AUDIO CONTROL SWITCH INSPECTION
- ACCESSORY SOCKET REMOVAL/INSTALLATION
- ACCESSORY SOCKET INSPECTION

## POWER SYSTEMS

- POWER SYSTEM LOCATION INDEX
- FUSE SERVICE WARNINGS
- FUSE SERVICE CAUTIONS
- UPPER BLOCK REMOVAL/INSTALLATION
- MAIN FUSE REMOVAL/INSTALLATION
- IGNITION SWITCH REMOVAL/INSTALLATION
- IGNITION SWITCH INSPECTION
- KEY REMINDER SWITCH REMOVAL/INSTALLATION [EXCEPT ADVANCED KEYLESS SYSTEM]
- KEY REMINDER SWITCH INSPECTION [EXCEPT ADVANCED KEYLESS SYSTEM]
- STEERING LOCK UNIT INSPECTION [ADVANCED KEYLESS SYSTEM]
- RELAY LOCATION
- TRUNK LID OPENER RELAY REMOVAL/INSTALLATION
- RELAY INSPECTION

## INSTRUMENTATION/DRIVER INFO.

- INSTRUMENTATION/DRIVER INFO. LOCATION INDEX
- INSTRUMENT CLUSTER REMOVAL/INSTALLATION
- INSTRUMENT CLUSTER CONFIGURATION
- INSTRUMENT CLUSTER DISASSEMBLY/ASSEMBLY
- INSTRUMENT CLUSTER INSPECTION
- INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE
- FUEL GAUGE SENDER UNIT INSPECTION
- OIL PRESSURE SWITCH INSPECTION
- HORN REMOVAL/INSTALLATION

## TECHNICAL DATA

## BODY ELECTRICAL SYSTEM

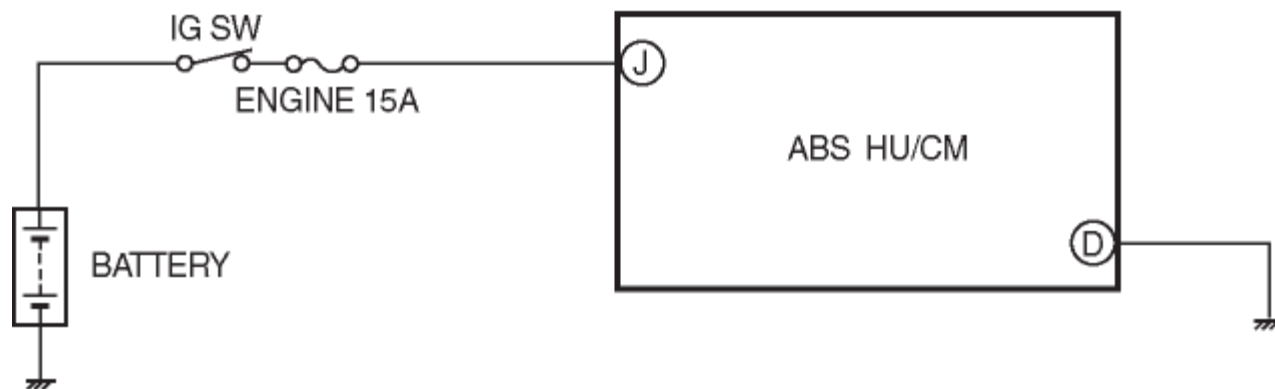
### SERVICE TOOLS

- BODY AND ACCESSORIES SST

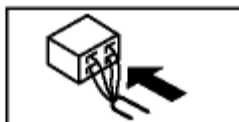
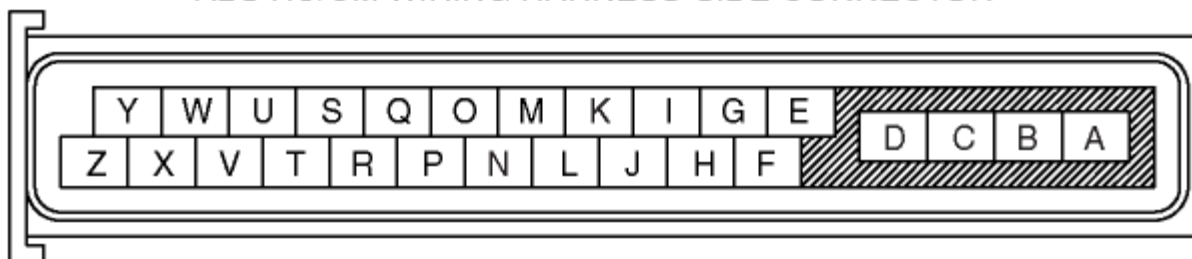
2008 - MX-5 - Brakes

DTC B1317, B1318 [ABS]

DTC	B1317, B1318	Power supply system
DETECTION CONDITION	<ul style="list-style-type: none"><li>• B1317<ul style="list-style-type: none"><li>▪ The voltage at ABS HU/CM terminal J is <b>16.8 V</b> or more.</li></ul></li><li>• B1318<ul style="list-style-type: none"><li>▪ The vehicle speed exceeds <b>6 km/h</b> and the voltage at ABS HU/CM terminal J is less than <b>9.6 V</b></li></ul></li></ul>	
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• ENGINE 15 A fuse malfunction</li><li>• Open circuit or short to ground in the wiring harness between the ABS HU/CM terminal J and the battery</li><li>• Open circuit or faulty ground in the wiring harness between the ABS HU/CM terminal D and the body ground</li><li>• Battery deterioration</li><li>• Generator malfunction</li><li>• Poor connection at connectors (female terminal)</li></ul>	



ABS HU/CM WIRING HARNESS-SIDE CONNECTOR



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT BATTERY VOLTAGE</b> <ul style="list-style-type: none"> <li>Is the battery terminal voltage normal?</li> </ul>	Yes Make sure that battery terminal connection is normal. Go to the next step.
		No Charge or replace the battery, then go to Step 6. (See <a href="#">BATTERY RECHARGING [LF]</a> .) (See <a href="#">BATTERY REMOVAL/INSTALLATION [LF]</a> .)
2	<b>INSPECT BATTERY GRAVITY</b> <ul style="list-style-type: none"> <li>Is battery specific gravity as specified?</li> </ul>	Yes Go to the next step.
		No Replace the battery, then go to Step 6. (See <a href="#">BATTERY REMOVAL/INSTALLATION [LF]</a> .)
3	<b>INSPECT CHARGING SYSTEM</b> <ul style="list-style-type: none"> <li>Are the generator and drive belt tensions normal?</li> </ul>	Yes Go to the next step.
		No Replace generator and/or drive belt as necessary, then go to Step 6. (See <a href="#">DRIVE BELT REPLACEMENT [LF]</a> .)

			(See <a href="#">GENERATOR REMOVAL/INSTALLATION [LF]</a> .)
4	<b>INSPECT ABS HU/CM POWER SUPPLY FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Start the engine.</li> <li>Measure the voltage between ABS HU/CM terminal J and ground.</li> <li>Is the voltage <b>approx. 10 V</b>?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit between the ABS HU/CM and ground, then go to Step 6.
5	<b>INSPECT ABS HU/CM GROUND FOR POOR GROUND OR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Measure the resistance between ground and ABS HU/CM terminal D.</li> <li>Is the resistance <b>within 0—1 ohm</b>?</li> </ul>	Yes	Go to the next step.
		No	If there is no continuity: <ul style="list-style-type: none"> <li>Repair or replace the wiring harness for open circuit between the ABS HU/CM and ground, then go to the next step.</li> </ul> If the resistance is not <b>within 0—1 ohm</b> : <ul style="list-style-type: none"> <li>Repair or replace harness for poor ground, then go to the next step.</li> </ul>
6	<b>VERIFY TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the memory.</li> </ul> (See <a href="#">ON-BOARD DIAGNOSIS[ABS]</a> .) <ul style="list-style-type: none"> <li>Start the engine and drive the vehicle at <b>10 km/h {6.2 mph} or more</b>.</li> <li>Is the same DTC present?</li> </ul>	Yes	Replace the ABS HU/CM, then go to the next step.  (See <a href="#">ABS HU/CM REMOVAL/INSTALLATION</a> .)
		No	Go to the next step.
7	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Are any other DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection.  (See <a href="#">ON-BOARD DIAGNOSIS[ABS]</a> .)
		No	DTC troubleshooting completed.



## 2008 - MX-5 - Brakes

### DTC B2477 [ABS]

<b>DTC</b>	<b>B2477</b>	<b>ABS HU/CM configuration</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>Configuration setting failure is detected.</li> </ul>	
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Module configuration procedure was not completed properly.</li> </ul>	

### Diagnostic procedure

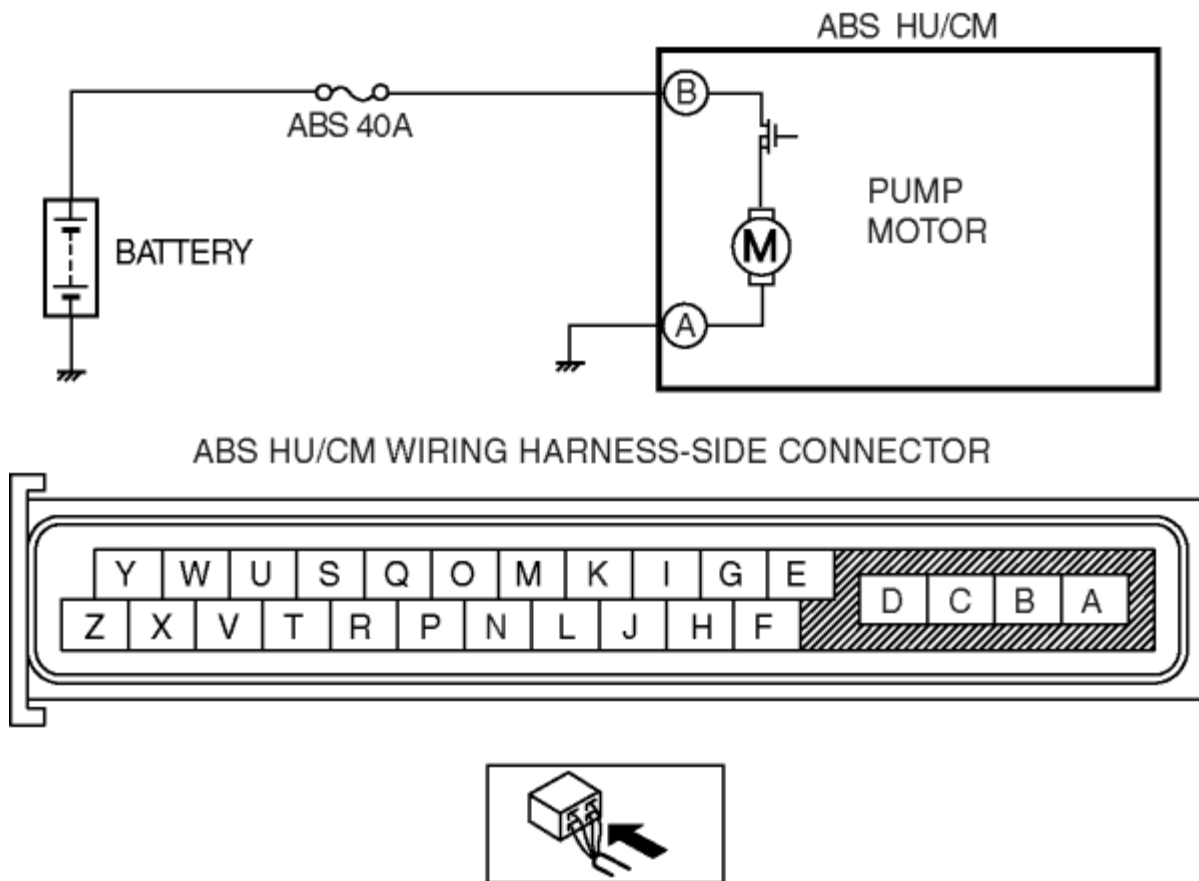
STEP	INSPECTION	ACTION
1	<b>VERIFY CONFIGURATION</b> <ul style="list-style-type: none"> <li>Has the ABS HU/CM configuration been performed?</li> </ul>	Yes Go to the next step.
		No Perform configuration using the M-MDS. (See <a href="#">ABS CONFIGURATION</a> .)
2	<b>VERIFY DTC TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"> <li>Clear the DTC from the memory. (See <a href="#">ON-BOARD DIAGNOSIS[ABS]</a>.)</li> <li>Is the same DTC present?</li> </ul>	Yes Repeat the inspection from Step 1.  If the malfunction recurs, replace the ABS HU/CM.  (See <a href="#">ABS HU/CM REMOVAL/INSTALLATION</a> .)
		No Go to the next step.
3	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Are any other DTCs present?</li> </ul>	Yes Go to the applicable DTC inspection. (See <a href="#">ON-BOARD DIAGNOSIS[ABS]</a> .)
		No DTC troubleshooting completed.

2008 - MX-5 - Brakes

DTC C1095, C1096 [ABS]

DTC	C1095, C1096	Pump motor, motor relay system
DETECTION CONDITION		<ul style="list-style-type: none"><li>• C1095<ul style="list-style-type: none"><li>▪ When the pump motor monitor voltage remains at <b>2.0 V or more</b> for <b>1 s</b></li><li>▪ ABS motor monitor OFF signal is input within specified time limit when the motor signal is switched from ON to OFF by ABS HU/CM.</li></ul></li><li>• C1096<ul style="list-style-type: none"><li>▪ When the difference between the battery power supply voltage and pump motor power supply voltage remains at <b>4.0 V or more</b> for <b>0.1 s or more</b> while the pump motor is operating</li></ul></li></ul>
POSSIBLE CAUSE		<ul style="list-style-type: none"><li>• ABS 40 A fuse malfunction</li><li>• Open or short to ground circuit in the wiring harness between the battery and the ABS HU/CM terminal B</li><li>• Open circuit in the wiring harness between the ABS HU/CM terminal A and the body ground</li><li>• Open or short circuit in the ABS HU/CM internal motor relay, or stuck motor relay</li><li>• Open or short circuit in the ABS HU/CM internal motor, or frozen motor</li><li>• Fail-safe relay malfunction</li><li>• Poor connection at connectors (female terminal)</li></ul>





## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT ABS FUSE CONDITION</b> <ul style="list-style-type: none"> <li>Is the ABS 40A fuse normal?</li> </ul>	Yes Go to the next step.
		No Replace the fuse, then go to Step 5.
2	<b>INSPECT MOTOR RELAY POWER SUPPLY FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect ABS HU/CM connector.</li> <li>Turn the ignition switch to the ON position (engine off).</li> <li>Measure voltage between ABS HU/CM terminal B (harness-side) and ground.</li> <li>Is the voltage <b>B+</b>?</li> </ul>	Yes Go to the next step.
		No Repair or replace the wiring harness for open circuit between battery positive terminal and ABS HU/CM terminal B, then go to Step 5.
	<b>INSPECT PUMP MOTOR GROUND FOR</b>	

3	<b>OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Inspect for continuity between ABS HU/CM terminal A (harness-side) and ground.</li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.
4	<b>VERIFY PUMP MOTOR OPERATION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Connect the M-MDS to the DLC-2.</li> <li>• Turn the ignition switch to the ON position (engine off).</li> <li>• Access PMP_MOTOR active command modes using M-MDS.</li> <li>• Does the pump motor operate?</li> </ul>	Yes	Go to the next step.
5	<b>VERIFY TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Clear the DTC from the memory. (See <b>ON-BOARD DIAGNOSIS[ABS].</b>)</li> <li>• Start the engine and drive the vehicle at <b>10 km/h {6.2 mph} or more.</b></li> <li>• Gradually slow down and stop the vehicle.</li> <li>• Is the same DTC present?</li> </ul>	Yes	Replace the ABS HU/CM, then go to the next step. (See <b>ABS HU/CM REMOVAL/INSTALLATION.</b> )
6	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Are any other DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <b>ON-BOARD DIAGNOSIS[ABS].</b> )

		No DTC troubleshooting completed.
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2008 - MX-5 - Brakes

DTC C1141, C1142, C1143, C1144 [ABS]

DTC	C1141	LF ABS sensor rotor system
	C1142	RF ABS sensor rotor system
	C1143	LR ABS sensor rotor system
	C1144	RR ABS sensor rotor system
DETECTION CONDITION		<ul style="list-style-type: none"><li>Periodic abnormality is detected in the signal wave pattern from the ABS wheel-speed sensors.</li></ul>
POSSIBLE CAUSE		<ul style="list-style-type: none"><li>ABS wheel-speed sensor malfunction</li><li>ABS sensor rotor malfunction (foreign material adhering)</li><li>Improper installation of ABS wheel-speed sensor and/or sensor rotor</li><li>Excessive clearance between the ABS wheel-speed sensor and sensor rotor</li></ul>

Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT PID FOR ABS WHEEL-SPEED SENSOR OUTPUT ERROR USING M-MDS</b>	Yes Go to Step 4.
	<ul style="list-style-type: none"><li>Turn the ignition switch off.</li><li>Connect the M-MDS to the DLC-2.</li><li>Select the following PIDs using the M-MDS:  LF_WSPD LR_WSPD RF_WSPD RR_WSPD</li><li>Drive the vehicle.</li><li>Verify that the vehicle speeds detected by</li></ul>	No Go to the next step.

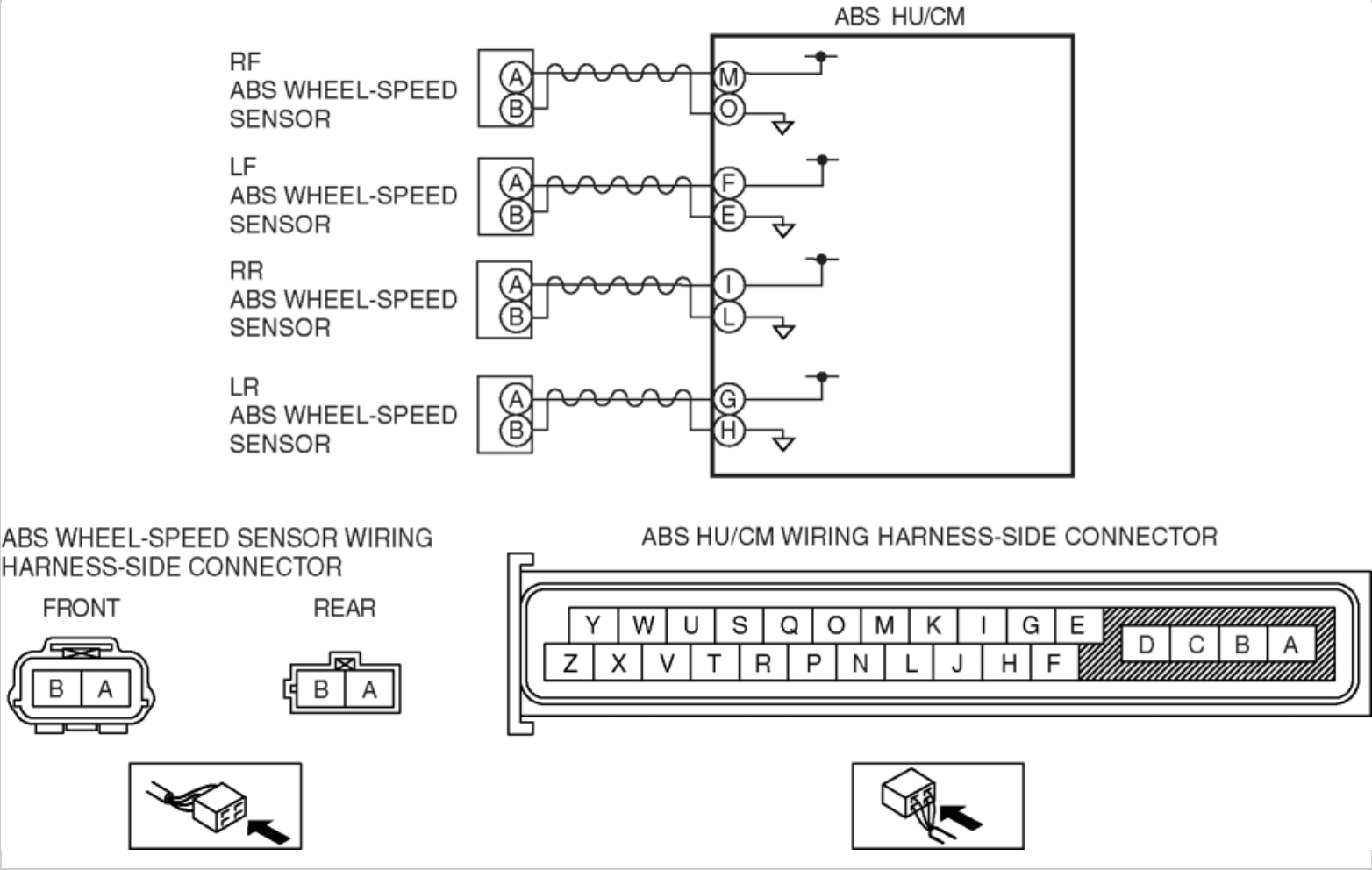
	<p>the four ABS wheel-speed sensors are approximately the same.</p> <ul style="list-style-type: none"><li>Are the vehicle speeds approximately the same?</li></ul>		
2	<p><b>INSPECT IF MALFUNCTION OCCURRED DUE TO IMPROPER SENSOR CLEARANCE.</b></p> <ul style="list-style-type: none"><li>Inspect the clearance between the ABS wheel-speed sensor and the ABS sensor rotor.  (See <b>FRONT ABS WHEEL-SPEED SENSOR INSPECTION.</b>)  (See <b>REAR ABS WHEEL-SPEED SENSOR INSPECTION.</b>)</li><li>Is the clearance normal?<ul style="list-style-type: none"><li><b>Clearance</b>  Front: 0.3—1.0 mm {0.012—0.057 in}  Rear: 0.8—1.6 mm {0.032—0.062 in}</li></ul></li></ul>	<p>Yes Go to the next step.</p> <p>No Replace the ABS wheel-speed sensor, then go to Step 4.  (See <b>FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.</b>)  (See <b>REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.</b>)</p>	
3	<p><b>VISUALLY INSPECT ABS SENSOR ROTOR FOR FOREIGN MATERIAL ADHERING OR IMPROPER INSTALLATION</b></p> <ul style="list-style-type: none"><li>Is the result normal?</li></ul>	<p>Yes Go to the next step.</p> <p>No Replace the front wheel hub component or rear drive shaft, then go to the next step.  (See <b>WHEEL HUB, STEERING KNUCKLE REMOVAL/INSTALLATION.</b>)  (See <b>REAR DRIVE SHAFT REMOVAL/INSTALLATION.</b>)</p>	
4	<p><b>VERIFY THAT THE SAME DTC IS NOT PRESENT</b></p> <ul style="list-style-type: none"><li>Clear the DTCs from the memory.  (See <b>ON-BOARD DIAGNOSIS[ABS].</b>)</li><li>Start the engine and drive the vehicle at <b>10 km/h {6.2 mph} or more.</b></li><li>Are the same DTCs present?</li></ul>	<p>Yes Repeat the inspection from Step 1.  If the malfunction recurs, replace the ABS HU/CM, then go to the next step.  (See <b>ABS HU/CM REMOVAL/INSTALLATION.</b>)</p> <p>No Go to the next step.</p>	
5	<p><b>VERIFY THAT NO OTHER DTCS ARE PRESENT</b></p> <ul style="list-style-type: none"><li>Are any other DTCs output?</li></ul>	<p>Yes Go to the applicable DTC inspection.  (See <b>ON-BOARD DIAGNOSIS[ABS].</b>)</p> <p>No DTC troubleshooting completed.</p>	



2008 - MX-5 - Brakes

DTC C1145, C1155, C1165, C1175 [ABS]

DTC	C1145	RF ABS wheel-speed sensor (open circuit) system
	C1155	LF ABS wheel-speed sensor (open circuit) system
	C1165	RR ABS wheel-speed sensor (open circuit) system
	C1175	LR ABS wheel-speed sensor (open circuit) system
DETECTION CONDITION		<ul style="list-style-type: none"><li>Open circuit or short to ground has been detected in the ABS wheel-speed sensor wiring harness on any of the four vehicle wheels.</li></ul>
POSSIBLE CAUSE		<ul style="list-style-type: none"><li>Open circuit or short to ground in the wiring harness between the following ABS HU/CM terminal and the ABS wheel-speed sensor terminal:<ul style="list-style-type: none"><li>ABS HU/CM terminal M—RF ABS wheel-speed sensor terminal A</li><li>ABS HU/CM terminal O—RF ABS wheel-speed sensor terminal B</li><li>ABS HU/CM terminal F—LF ABS wheel-speed sensor terminal A</li><li>ABS HU/CM terminal E—LF ABS wheel-speed sensor terminal B</li><li>ABS HU/CM terminal I—RR ABS wheel-speed sensor terminal A</li><li>ABS HU/CM terminal L—RR ABS wheel-speed sensor terminal B</li><li>ABS HU/CM terminal G—LR ABS wheel-speed sensor terminal A</li><li>ABS HU/CM terminal H—LR ABS wheel-speed sensor terminal B</li></ul></li><li>ABS wheel-speed sensor malfunction</li><li>Poor connection at connectors (female terminal)</li></ul>



**Diagnostic procedure**

STEP	INSPECTION	ACTION
1	<b>INSPECT PID TO VERIFY THAT WHEEL SPEED-SIGNALS ARE TRANSMITTED FROM ABS WHEEL- SPEED SENSOR USING M-MDS</b> <ul style="list-style-type: none"><li>• Turn the ignition switch off.</li><li>• Connect the M-MDS to the DLC-2.</li><li>• Select the following PIDs using the M-MDS: LF_WSPD LR_WSPD RF_WSPD RR_WSPD</li><li>• Drive the vehicle.</li><li>• Verify that the wheel speed-signals are transmitted from each ABS wheel-speed sensor.</li><li>• Are the wheel-speed signals transmitted?</li></ul>	<div>YesGo to Step 3.</div> <div>NoGo to the next step.</div>
2	<b>INSPECT FOR OPEN CIRCUIT IN WIRING HARNESS BETWEEN ABS HU/CM AND ABS WHEEL-SPEED SENSOR</b> <ul style="list-style-type: none"><li>• Turn the ignition switch off.</li><li>• Disconnect the ABS HU/CM connector and ABS wheel-speed sensor.</li></ul>	<div>YesReplace the ABS wheel-speed sensor, then go to the next step.</div> <div>(See <a href="#">FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION</a>.)</div>



	<p>Inspect for continuity in the wiring harness between the following ABS wheel-speed sensor connectors on the vehicle wiring harness-side and ABS HU/CM connectors.</p> <ul style="list-style-type: none"> <li>▪ RF ABS wheel-speed sensor (+): M—A</li> <li>▪ RF ABS wheel-speed sensor (–): O—B</li> <li>▪ LF ABS wheel-speed sensor (+): F—A</li> <li>▪ LF ABS wheel-speed sensor (–): E—B</li> <li>▪ RR ABS wheel-speed sensor (+): I—A</li> <li>▪ RR ABS wheel-speed sensor (–): L—B</li> <li>▪ LR ABS wheel-speed sensor (+): G—A</li> <li>▪ LR ABS wheel-speed sensor (–): H—B</li> </ul> <ul style="list-style-type: none"> <li>• Is there continuity?</li> </ul>	<p>(See <a href="#">REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.</a>)</p> <p>No Repair or replace the wiring harness, then go to the next step.</p>
3	<p><b>VERIFY THAT THE SAME DTC IS NOT PRESENT</b></p> <ul style="list-style-type: none"> <li>• Clear the DTCs from the memory. (See <a href="#">ON-BOARD DIAGNOSIS[ABS].</a>)</li> <li>• Start the engine and drive the vehicle at <b>10 km/h {6.2 mph} or more.</b></li> <li>• Are the same DTCs present?</li> </ul>	<p>Yes Repeat the inspection from Step 1.  If the malfunction recurs, replace the ABS HU/CM, then go to the next step.  (See <a href="#">ABS HU/CM REMOVAL/INSTALLATION.</a>)</p> <p>No Go to the next step.</p>
4	<p><b>VERIFY THAT NO OTHER DTCs ARE PRESENT</b></p> <ul style="list-style-type: none"> <li>• Are any other DTCs output?</li> </ul>	<p>Yes Go to the applicable DTC inspection.  (See <a href="#">ON-BOARD DIAGNOSIS[ABS].</a>)</p> <p>No DTC troubleshooting completed.</p>

## 2008 - MX-5 - Brakes

### DTC C1148, C1158, C1168, C1178 [ABS]

<b>DTC</b>	<b>C1148</b>	<b>RF ABS wheel-speed sensor/ABS sensor rotor system</b>
	<b>C1158</b>	<b>LF ABS wheel-speed sensor/ABS sensor rotor system</b>
	<b>C1168</b>	<b>RR ABS wheel-speed sensor/ABS sensor rotor system</b>
	<b>C1178</b>	<b>LR ABS wheel-speed sensor/ABS sensor rotor system</b>
<b>DETECTION CONDITION</b>		<ul style="list-style-type: none"> <li>Vehicle wheel speed signals of any of the four vehicle wheels indicate abnormal acceleration that exceeds specification.</li> <li>Vehicle wheel speed signals of any of the four vehicle wheels indicate speed that exceeds specification.</li> </ul>
<b>POSSIBLE CAUSE</b>		<ul style="list-style-type: none"> <li>ABS wheel-speed sensor malfunction (low output, metal shavings on sensor)</li> <li>ABS sensor rotor malfunction (chipping of sensor rotor teeth)</li> <li>Poor installation of ABS wheel-speed sensor and/or sensor rotor (If the sensor rotor is installed at an angle, it may cause output of abnormal wave pattern at high speeds.)</li> <li>Excessive clearance between the ABS wheel-speed sensor and sensor rotor</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT PID FOR ABNORMAL OUTPUT FROM ABS WHEEL-SPEED SENSOR USING M-MDS</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Connect the M-MDS to the DLC-2.</li> <li>Select the following PIDs using the M-MDS: <ul style="list-style-type: none"> <li>LF_WSPD</li> <li>LR_WSPD</li> <li>RF_WSPD</li> <li>RR_WSPD</li> </ul> </li> </ul>	Yes Go to Step 4.
		No If there is a difference in speeds of the four wheels, go to the next step.

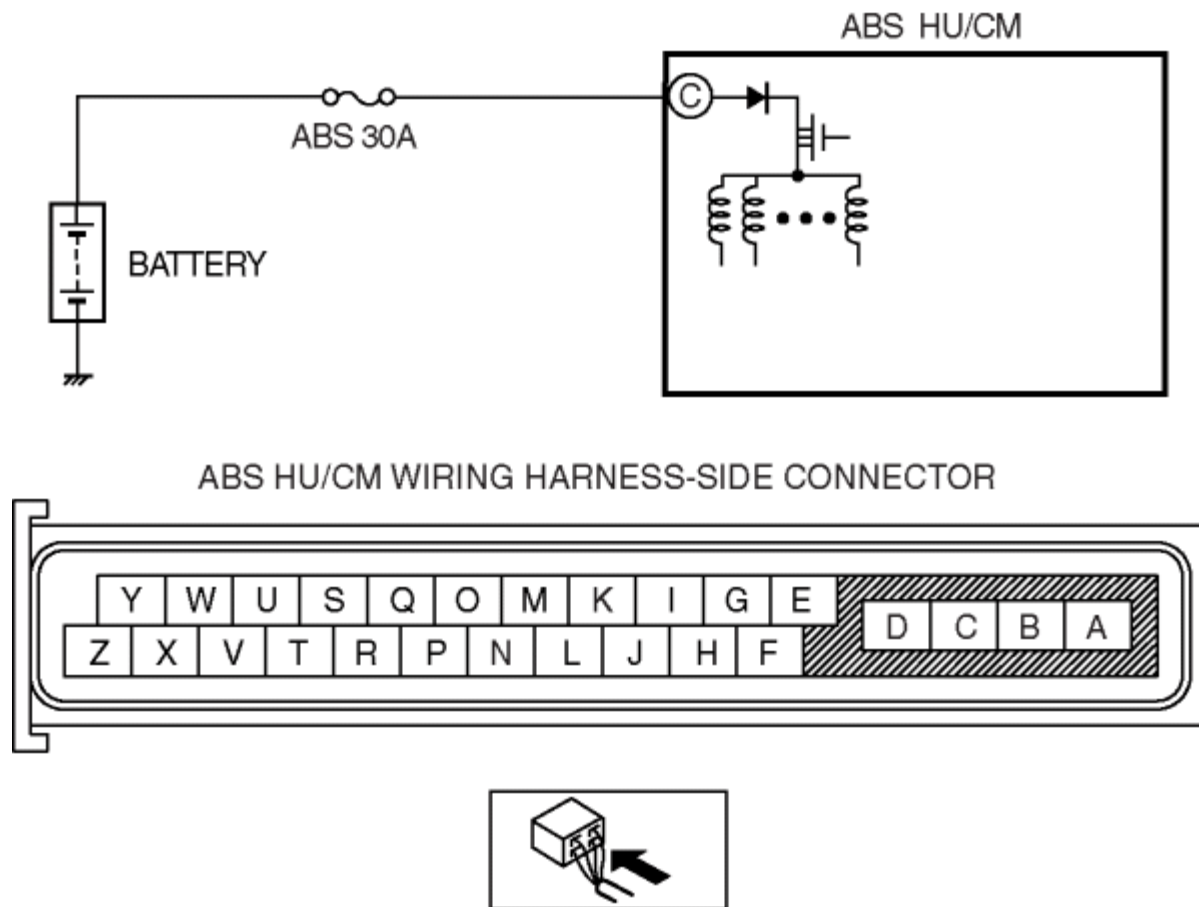
	<ul style="list-style-type: none"> <li>Start the engine and drive the vehicle.</li> <li>Verify that the PIDs of the four ABS wheel-speed sensors correspond approximately.</li> <li>Do the vehicle speeds correspond?</li> </ul>		
2	<b>INSPECT IF MALFUNCTION OCCURRED DUE TO IMPROPER SENSOR CLEARANCE</b> <ul style="list-style-type: none"> <li>Inspect the clearance between the ABS wheel-speed sensor and the ABS sensor rotor. <ul style="list-style-type: none"> <li><b>Clearance</b> <p><b>Front: 0.3—1.0 mm</b> <b>{0.012—0.057 in}</b></p> <p><b>Rear: 0.8—1.6 mm</b> <b>{0.032—0.062 in}</b></p> </li> </ul> </li> </ul>	Yes	Go to the next step.
		No	Replace the rear ABS wheel-speed sensor, then go to Step 4.  (See <b>FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.</b> )  (See <b>REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.</b> )
3	<b>VISUALLY INSPECT ABS SENSOR ROTOR FOR FOREIGN MATERIAL ADHERING OR IMPROPER INSTALLATION</b> <ul style="list-style-type: none"> <li>Is the result normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the front wheel hub component or rear drive shaft, then go to the next step.  (See <b>WHEEL HUB, STEERING KNUCKLE REMOVAL/INSTALLATION.</b> )  (See <b>REAR DRIVE SHAFT REMOVAL/INSTALLATION.</b> )
4	<b>VERIFY DTC TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the memory. (See <b>ON-BOARD DIAGNOSIS[ABS].</b>)</li> <li>Start the engine and drive the vehicle at <b>10 km/h {6.2 mph} or more.</b></li> <li>Are the same DTCs present?</li> </ul>	Yes	Repeat the inspection from Step 1.  If the malfunction recurs, replace the ABS HU/CM.  (See <b>ABS HU/CM REMOVAL/INSTALLATION.</b> )
		No	Go to the next step.
5	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Are any other DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection.  (See <b>ON-BOARD DIAGNOSIS[ABS].</b> )
		No	DTC troubleshooting completed.



2008 - MX-5 - Brakes

DTC C1186, C1266 [ABS]

DTC	C1186, C1266	Fail-safe relay system
DETECTION CONDITION	<ul style="list-style-type: none"><li>• C1186<ul style="list-style-type: none"><li>▪ ABS HU/CM internal valve relay remains OFF when valve relay ON is commanded.</li></ul></li><li>• C1266<ul style="list-style-type: none"><li>▪ ABS HU/CM internal valve relay remains ON (stuck) when valve relay OFF is commanded.</li></ul></li></ul>	
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• ABS 30 A fuse malfunction</li><li>• Open circuit or short to ground in the wiring harness between the battery and the ABS HU/CM terminal C</li><li>• Open or short circuit in the ABS HU/CM internal valve relay, or stuck valve relay</li><li>• Poor connection at connectors (female terminal)</li></ul>	



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT ABS FUSE CONDITION</b> <ul style="list-style-type: none"> <li>Is the ABS 30 A fuse normal?</li> </ul>	Yes Go to the next step.
		No Replace the fuse, then go to Step 3.
2	<b>INSPECT VALVE RELAY POWER SUPPLY FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect ABS HU/CM connector.</li> <li>Turn the ignition switch to the ON position (engine off).</li> <li>Measure voltage between ABS HU/CM terminal C (harness-side) and ground.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes Go to the next step.
		No Repair or replace the wiring harness for open circuit between battery positive terminal and DSC HU/CM terminal C, then go to the next step.

3	<b>VERIFY TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"> <li>Clear the DTC from the memory.</li> </ul> (See <b>ON-BOARD DIAGNOSIS[ABS].</b> ) <ul style="list-style-type: none"> <li>Is the same DTC present?</li> </ul>	Yes	Replace the ABS HU/CM, then go to next step. (See <b>ABS HU/CM REMOVAL/INSTALLATION.</b> )
		No	Go to the next step.
4	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Are any other DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <b>ON-BOARD DIAGNOSIS[ABS].</b> )
		No	DTC troubleshooting completed.

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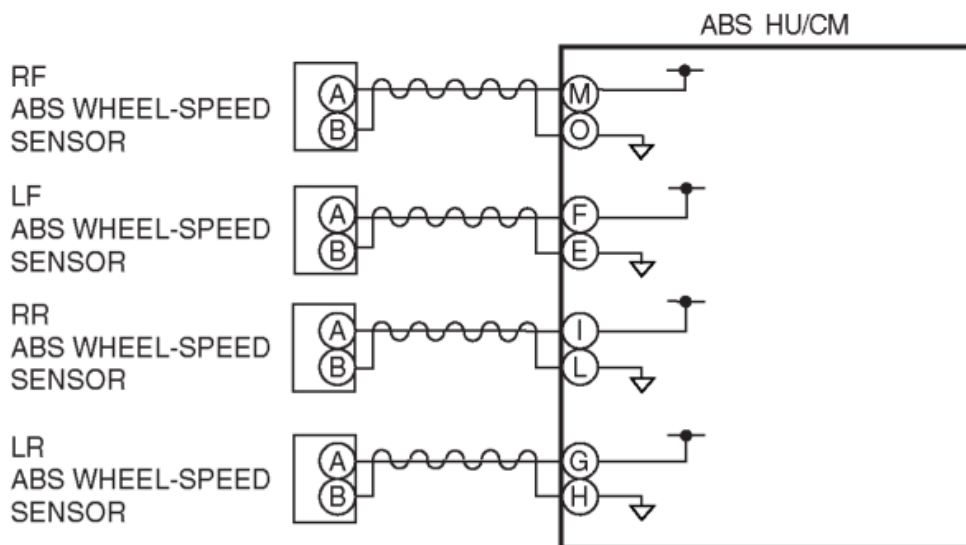
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2008 - MX-5 - Brakes

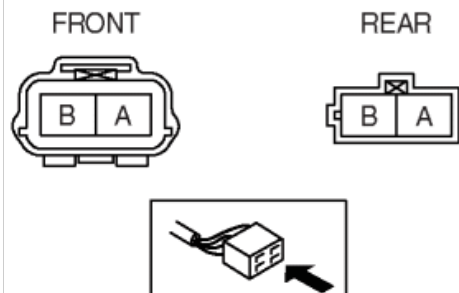
DTC C1233, C1234, C1235, C1236 [ABS]

DTC	C1233	LF ABS wheel-speed sensor (short to ground) system
	C1234	RF ABS wheel-speed sensor (short to ground) system
	C1235	RR ABS wheel-speed sensor (short to ground) system
	C1236	LR ABS wheel-speed sensor (short to ground) system
DETECTION CONDITION		<ul style="list-style-type: none"><li>The vehicle wheel speed of any of the four vehicle wheels is <b>2.75 km/h {1.71 mph} or less</b> when driving at the specified vehicle speed or more.</li></ul>
POSSIBLE CAUSE		<ul style="list-style-type: none"><li>Short to ground in the wiring harness between the following ABS HU/CM terminal and the ABS wheel-speed sensor terminal:<ul style="list-style-type: none"><li>ABS HU/CM terminal M—RF ABS wheel-speed sensor terminal A</li><li>ABS HU/CM terminal O—RF ABS wheel-speed sensor terminal B</li><li>ABS HU/CM terminal F—LF ABS wheel-speed sensor terminal A</li><li>ABS HU/CM terminal E—LF ABS wheel-speed sensor terminal B</li><li>ABS HU/CM terminal I—RR ABS wheel-speed sensor terminal A</li><li>ABS HU/CM terminal L—RR ABS wheel-speed sensor terminal B</li><li>ABS HU/CM terminal G—LR ABS wheel-speed sensor terminal A</li><li>ABS HU/CM terminal H—LR ABS wheel-speed sensor terminal B</li></ul></li><li>ABS wheel-speed sensor malfunction</li><li>Poor connection at connectors (female terminal)</li></ul>

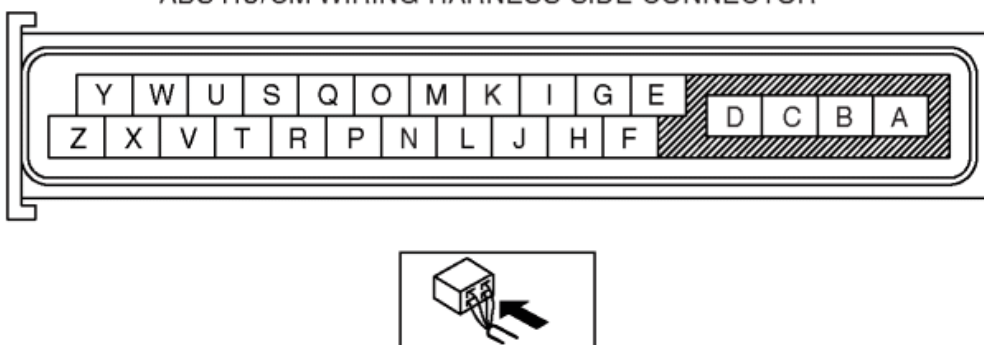




ABS WHEEL-SPEED SENSOR WIRING  
HARNESS-SIDE CONNECTOR



ABS HU/CM WIRING HARNESS-SIDE CONNECTOR



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT PID TO VERIFY THAT WHEEL SPEED-SIGNALS ARE TRANSMITTED FROM ABS WHEEL- SPEED SENSOR USING M-MDS</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Connect the M-MDS to the DLC-2.</li> <li>Select the following PIDs using the M-MDS: <ul style="list-style-type: none"> <li>LF_WSPD</li> <li>LR_WSPD</li> <li>RF_WSPD</li> <li>RR_WSPD</li> </ul> </li> <li>Drive the vehicle.</li> <li>Verify that the wheel speed-signals are transmitted from each ABS wheel-speed sensor.</li> <li>Are the wheel-speed signals transmitted?</li> </ul>	<p>Yes Go to Step 3.</p> <p>No Go to the next step.</p>
2	<b>INSPECT A SHORT TO GROUND IN THE WIRING HARNESS BETWEEN THE ABS HU/CM AND THE ABS WHEEL-SPEED SENSOR</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the ABS HU/CM connector and the ABS wheel-speed sensor connector.</li> </ul>	<p>Yes Replace the ABS wheel-speed sensor, then go to the next step.</p> <p>(See <a href="#">FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.</a>)</p>

	<ul style="list-style-type: none"><li>Inspect for a short to ground in the wiring harness between the following ABS wheel-speed sensor connectors on the vehicle wiring harness-side and ABS HU/CM connectors.<ul style="list-style-type: none"><li>RF ABS wheel-speed sensor (+): M—A</li><li>RF ABS wheel-speed sensor (–): O—B</li><li>LF ABS wheel-speed sensor (+): F—A</li><li>LF ABS wheel-speed sensor (–): E—B</li><li>RR ABS wheel-speed sensor (+): I—A</li><li>RR ABS wheel-speed sensor (–): L—B</li><li>LR ABS wheel-speed sensor (+): G—A</li><li>LR ABS wheel-speed sensor (–): H—B</li></ul></li><li>Is there continuity?</li></ul>	(See <a href="#">REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.</a> )
		No Repair or replace the wiring harness, then go to the next step.
3	<b>VERIFY THAT THE SAME DTC IS NOT PRESENT</b> <ul style="list-style-type: none"><li>Clear the DTCs from the memory. (See <a href="#">ON-BOARD DIAGNOSIS[ABS].</a>)</li><li>Start the engine and drive the vehicle at <b>10 km/h {6.2 mph} or more.</b></li><li>Are the same DTCs present?</li></ul>	Yes Repeat the inspection from Step 1.  If the malfunction recurs, replace the ABS HU/CM, then go to the next step.  (See <a href="#">ABS HU/CM REMOVAL/INSTALLATION.</a> )
		No Go to the next step.
4	<b>VERIFY THAT NO OTHER DTCS ARE PRESENT</b> <ul style="list-style-type: none"><li>Are any other DTCs output?</li></ul>	Yes Go to the applicable DTC inspection.  (See <a href="#">ON-BOARD DIAGNOSIS[ABS].</a> )

## 2008 - MX-5 - Brakes

### DTC C1805 [ABS]

<b>DTC</b>	<b>C1805</b>	<b>Incorrect ABS HU/CM installed</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The programmed vehicle information and the data received from the CAN do not correspond.</li> </ul>	
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>The correct ABS HU/CM is not installed.</li> </ul>	

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY THAT THE CORRECT ABS HU/CM IS INSTALLED</b> <ul style="list-style-type: none"> <li>Verify the part number of the ABS HU/CM.</li> <li>Is the part number correct?</li> </ul>	Yes Go to the next step.
		No After replacing the ABS, go to Step 3. (See <a href="#">ABS HU/CM REMOVAL/INSTALLATION.</a> )
2	<b>PERFORM CONFIGURATION</b> <ul style="list-style-type: none"> <li>Was configuration performed normally?</li> </ul>	Yes Go to the next step.
		No Replace the ABS HU/CM, then go to the next step. (See <a href="#">ABS HU/CM REMOVAL/INSTALLATION.</a> )
3	<b>VERIFY DTC TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the memory.</li> </ul> (See <a href="#">ON-BOARD DIAGNOSIS[ABS].</a> ) <ul style="list-style-type: none"> <li>Is the same DTC present?</li> </ul>	Yes Repeat the inspection from Step 1.  If the malfunction recurs, replace the ABS HU/CM, then go to the next step. (See <a href="#">ABS HU/CM REMOVAL/INSTALLATION.</a> )
		No Go to the next step.
4	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Are any other DTCs present?</li> </ul>	Yes Go to the applicable DTC inspection. (See <a href="#">ON-BOARD DIAGNOSIS[ABS].</a> )

			No DTC troubleshooting completed.
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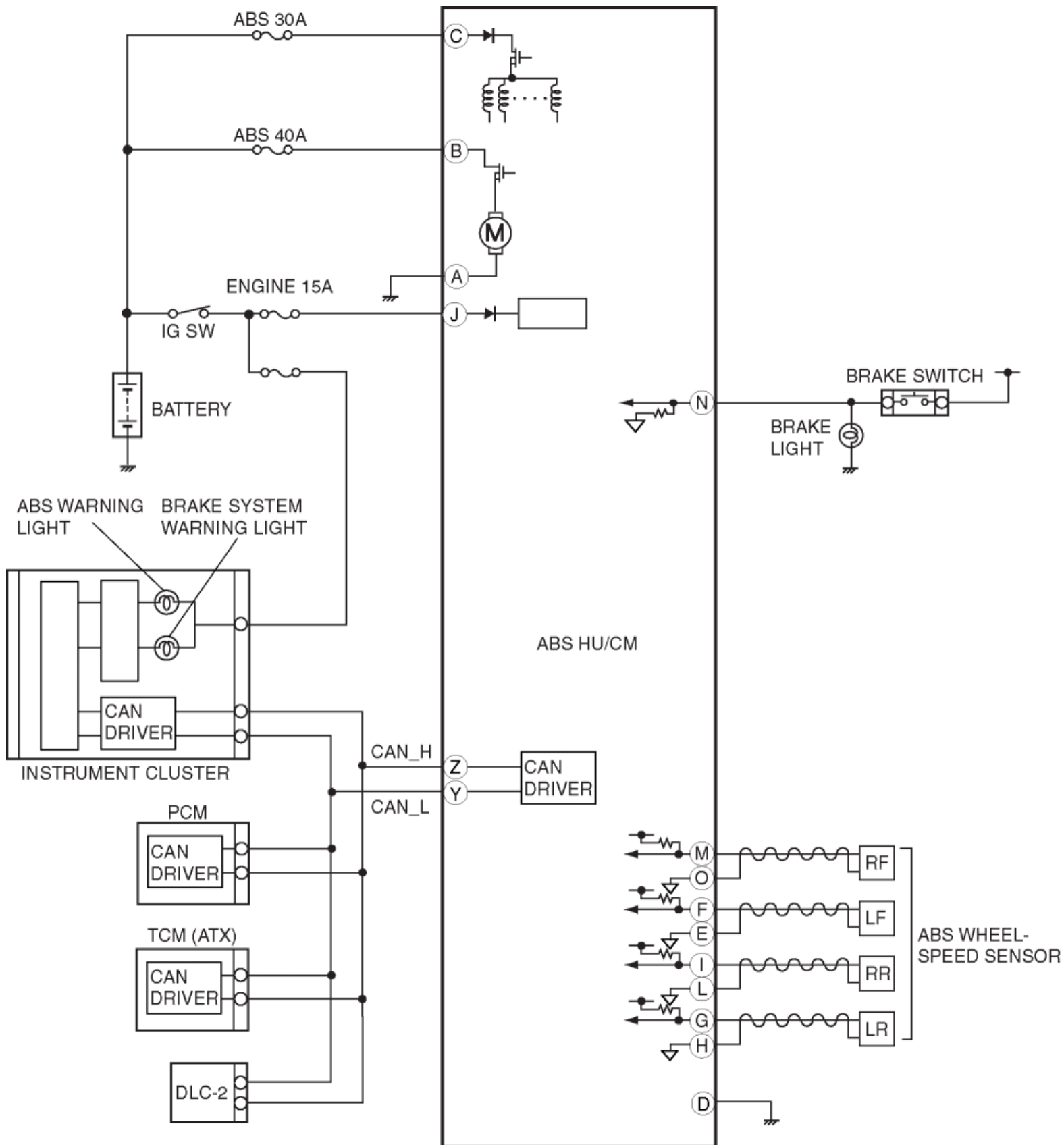
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2008 - MX-5 - Brakes

ABS SYSTEM WIRING DIAGRAM [ABS]



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## 2008 - MX-5 - Brakes

### DTC B1342 [ABS]

<b>DTC</b>	<b>B1342</b>	<b>ABS HU/CM system</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"><li>The ABS HU/CM on-board diagnostic function detects control module malfunction.</li></ul>	
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"><li>ABS HU/CM internal malfunction</li></ul>	

### Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>VERIFY CURRENT STATUS OF MALFUNCTION</b> <ul style="list-style-type: none"><li>Clear the DTC from the memory. (See <a href="#">ON-BOARD DIAGNOSIS[ABS]</a>.)</li><li>Is same DTC present?</li></ul>	Yes	Replace the ABS HU/CM, then go to the next step. (See <a href="#">ABS HU/CM REMOVAL/INSTALLATION</a> .)
		No	Go to the next step.
2	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>Are any other DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">ON-BOARD DIAGNOSIS[ABS]</a> .)
		No	DTC troubleshooting completed.

2008 - MX-5 - Brakes

DTC B1484 [ABS]

DTC	B1484	Brake switch system
DETECTION CONDITION	<ul style="list-style-type: none"><li>Open circuit in the wiring harness between the ABS HU/CM terminal and the brake switch terminal</li></ul>	
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Brake switch malfunction</li><li>Open circuit in the wiring harness between the ABS HU/CM terminal N and the brake switch terminal D</li></ul>	

ABS HU/CM

BRAKE SWITCH

BRAKE LIGHT

ABS HU/CM WIRING HARNESS-SIDE CONNECTOR

BRAKE SWITCH WIRING HARNESS-SIDE CONNECTOR

Diagnostic procedure

STEP	INSPECTION	ACTION
1	<div><b>INSPECT ABS HU/CM TO BRAKE SWITCH FOR OPEN CIRCUIT</b><ul style="list-style-type: none"><li>Turn the ignition switch off.</li><li>Disconnect the ABS HU/CM and brake switch connector.</li><li>Inspect for continuity ABS HU/CM terminal N and brake switch terminal D.</li></ul></div>	<div>YesGo to the next step.</div> <div>NoRepair or replace the wiring harness for open circuit between ABS HU/CM and brake switch, then go to the next step.</div>



	Is there continuity?		
2	<b>INSPECT BRAKE SWITCH</b> <ul style="list-style-type: none"> <li>Inspect the brake switch.</li> </ul> (See <b>BRAKE SWITCH INSPECTION</b> .) <ul style="list-style-type: none"> <li>Is the brake switch normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the brake switch, then go to the next step. (See <b>BRAKE PEDAL REMOVAL/INSTALLATION</b> .)
3	<b>VERIFY TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the memory.</li> </ul> (See <b>ON-BOARD DIAGNOSIS[ABS]</b> .) <ul style="list-style-type: none"> <li>Are the same DTCs present?</li> </ul>	Yes	Replace the ABS HU/CM, then go to the next step. (See <b>ABS HU/CM REMOVAL/INSTALLATION</b> .)
		No	Go to the next step.
4	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Are any other DTC present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <b>ON-BOARD DIAGNOSIS[ABS]</b> .)
		No	DTC troubleshooting completed.

## 2008 - MX-5 - Brakes

### ON-BOARD DIAGNOSIS [ABS]

#### On-Board Diagnostic (OBD) Test Description

- The OBD test inspects the integrity and function of the ABS and outputs the results when requested by the specific tests.
- On-board diagnostic test also:
  - Provides a quick inspection of the ABS usually performed at the start of each diagnostic procedure.
  - Provides verification after repairs to ensure that no other faults occurred during service.
- The OBD test is divided into 3 tests:
  - Read/clear diagnostic results, PID monitor and record and active command modes.

#### Read/clear diagnostic results

- This function allows you to read or clear DTCs in the ABS HU/CM memory.

#### PID/Data monitor and record

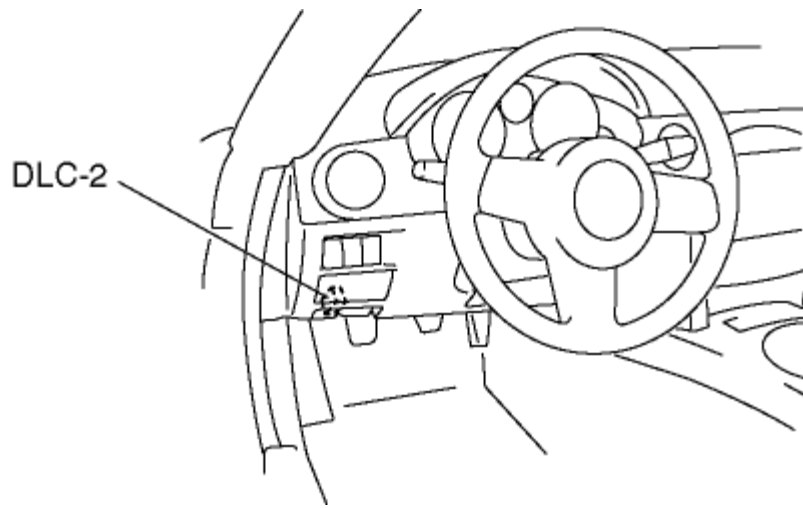
- This function allows you to access certain data values, input signals, calculated values, and system status information.

#### Active command modes

- This function allows you to control devices through the M-MDS.

#### Reading DTCs Procedure

1. Connect the M-MDS to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  1. Select "Self Test".
  2. Select "Modules".
  3. Select "ABS".
- When using the PDS (Pocket PC)
  1. Select "Module Tests".
  2. Select "ABS".
  3. Select "Self Test".

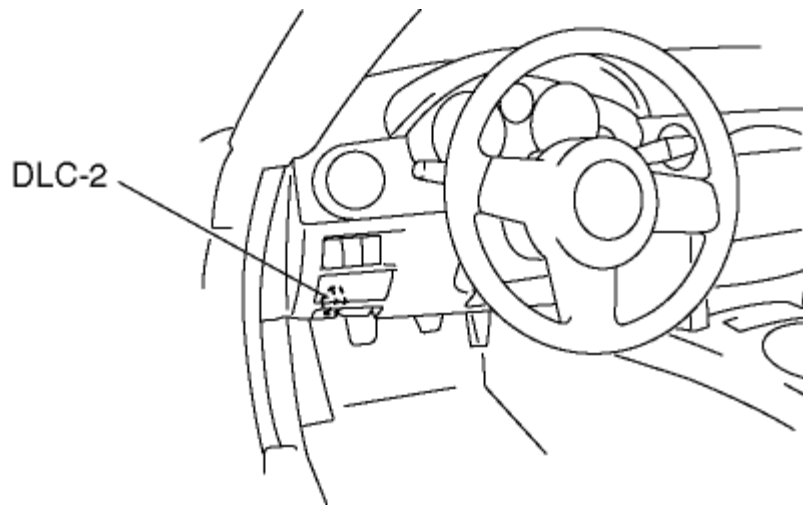
3. Verify the DTC according to the directions on the screen.

- If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.

4. After completion of repairs, clear all DTCs stored in the ABS. (See [Clearing DTCs Procedures](#).)

## Clearing DTCs Procedures

1. Connect the M-MDS to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  1. Select "Self Test".
  2. Select "Modules".
  3. Select "ABS".
- When using the PDS (Pocket PC)
  1. Select "Module Tests".
  2. Select "ABS".
  3. Select "Self Test".

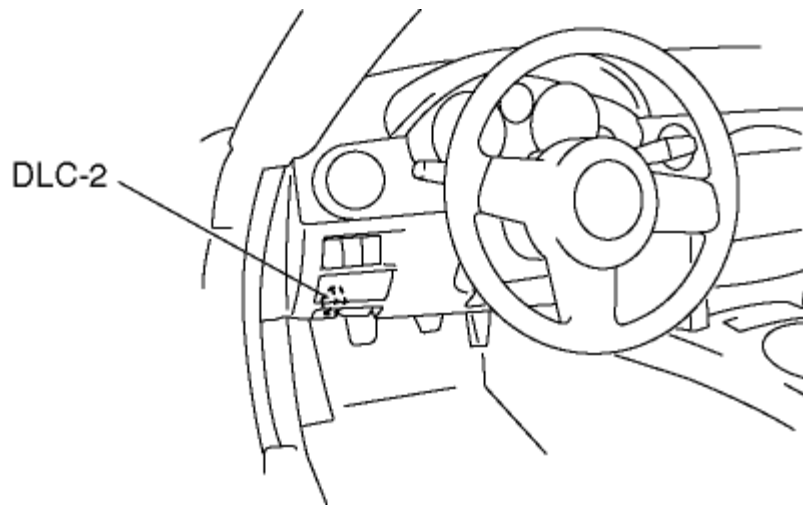
3. Verify the DTC according to the directions on the screen.

4. Press the clear button on the DTC screen to clear the DTC.

5. Verify that no DTCs are displayed.

## **PID/Data Monitor and Record Procedure**

1. Connect the M-MDS to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  1. Select "DataLogger".
  2. Select "Modules".
  3. Select "ABS".
- When using the PDS (Pocket PC)
  1. Select "Module Tests".
  2. Select "ABS".
  3. Select "DataLogger".

3. Select the applicable PID from the PID table.

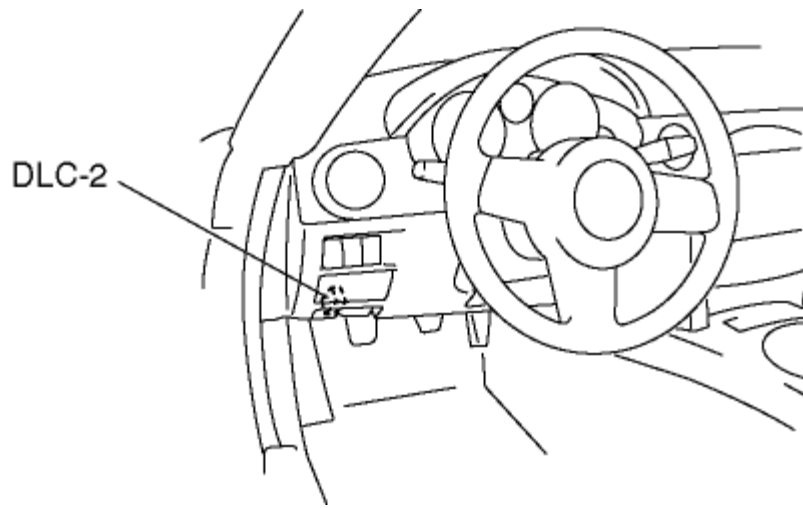
4. Verify the PID data according to the directions on the screen.

#### **NOTE:**

- The PID data screen function is used for monitoring the calculated value of input/output signals in the module. Therefore, if the monitored value of the output parts is not within the specification, it is necessary to inspect the monitored value of input parts corresponding to the applicable output part control. In addition, because the system does not display an output part malfunction as an abnormality in the monitored value, it is necessary to inspect the output parts individually

#### **Active Command Modes Procedure**

1. Connect the M-MDS to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  1. Select "DataLogger".
  2. Select "Modules".
  3. Select "ABS".
- When using the PDS (Pocket PC)
  1. Select "Module Tests".
  2. Select "ABS".
  3. Select "DataLogger".

3. Select the active command modes from the PID table.

4. Perform the active command modes, inspect the operations for each parts.

- If the operation of output parts cannot be verified after the active command mode inspection is performed, this could indicate the possibility of an open or short circuit, sticking, or operation malfunction in the output parts.

## DTC Table

DTC	System malfunction location	Page
M-MDS		
B1317	Power supply system	(See <a href="#">DTC B1317, B1318 [ABS]</a> .)
B1318	Power supply system	(See <a href="#">DTC B1317, B1318 [ABS]</a> .)

B1342	ABS HU/CM system	(See <a href="#">DTC B1342 [ABS]</a> .)
B1484	Brake switch system	(See <a href="#">DTC B1484 [ABS]</a> .)
B2477	ABS HU/CM configuration	(See <a href="#">DTC B2477 [ABS]</a> .)
C1095	Pump motor, motor relay system	(See <a href="#">DTC C1095, C1096 [ABS]</a> .)
C1096	Pump motor, motor relay system	(See <a href="#">DTC C1095, C1096 [ABS]</a> .)
C1141	LF ABS sensor rotor system	(See <a href="#">DTC C1141, C1142, C1143, C1144 [ABS]</a> .)
C1142	RF ABS sensor rotor system	(See <a href="#">DTC C1141, C1142, C1143, C1144 [ABS]</a> .)
C1143	LR ABS sensor rotor system	(See <a href="#">DTC C1141, C1142, C1143, C1144 [ABS]</a> .)
C1144	RR ABS sensor rotor system	(See <a href="#">DTC C1141, C1142, C1143, C1144 [ABS]</a> .)
C1145	RF ABS wheel-speed sensor system	(See <a href="#">DTC C1145, C1155, C1165, C1175 [ABS]</a> .)
C1148	RF ABS wheel-speed sensor system	(See <a href="#">DTC C1148, C1158, C1168, C1178 [ABS]</a> .)
C1155	LF ABS wheel-speed sensor system	(See <a href="#">DTC C1145, C1155, C1165, C1175 [ABS]</a> .)
C1158	LF ABS wheel-speed sensor system	(See <a href="#">DTC C1148, C1158, C1168, C1178 [ABS]</a> .)
C1165	RR ABS wheel-speed sensor system	(See <a href="#">DTC C1145, C1155, C1165, C1175 [ABS]</a> .)
C1168	RR ABS wheel-speed sensor system	(See <a href="#">DTC C1148, C1158, C1168, C1178 [ABS]</a> .)
C1175	LR ABS wheel-speed sensor system	(See <a href="#">DTC C1145, C1155, C1165, C1175 [ABS]</a> .)
C1178	LR ABS wheel-speed sensor system	(See <a href="#">DTC C1148, C1158, C1168, C1178 [ABS]</a> .)
C1186	Fail-safe relay system	(See <a href="#">DTC C1186, C1266 [ABS]</a> .)
C1194	LF outlet solenoid valve system	(See <a href="#">DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254 [ABS]</a> .)
C1198	LF inlet solenoid valve system	(See <a href="#">DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254 [ABS]</a> .)
C1210	RF outlet solenoid valve system	(See <a href="#">DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254 [ABS]</a> .)

C1214	RF inlet solenoid valve system	(See <a href="#">DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254 [ABS]</a> .)
C1233	LF ABS wheel-speed sensor/ABS sensor rotor system	(See <a href="#">DTC C1233, C1234, C1235, C1236 [ABS]</a> .)
C1234	RF ABS wheel-speed sensor/ABS sensor rotor system	(See <a href="#">DTC C1233, C1234, C1235, C1236 [ABS]</a> .)
C1235	RR ABS wheel-speed sensor/ABS sensor rotor system	(See <a href="#">DTC C1233, C1234, C1235, C1236 [ABS]</a> .)
C1236	LR ABS wheel-speed sensor/ABS sensor rotor system	(See <a href="#">DTC C1233, C1234, C1235, C1236 [ABS]</a> .)
C1242	LR outlet solenoid valve system	(See <a href="#">DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254 [ABS]</a> .)
C1246	RR outlet solenoid valve system	(See <a href="#">DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254 [ABS]</a> .)
C1250	LR inlet solenoid valve system	(See <a href="#">DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254 [ABS]</a> .)
C1254	RR inlet solenoid valve system	(See <a href="#">DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254 [ABS]</a> .)
C1266	Fail-safe relay system	(See <a href="#">DTC C1186, C1266 [ABS]</a> .)
C1805	Incorrect ABS HU/CM installed	(See <a href="#">DTC C1805 [ABS]</a> .)
U0073	CAN system communication error	(See <a href="#">DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM]</a> .)
U1900	Communication error to other module	(See <a href="#">DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM]</a> .)
U2023	Abnormal message from PCM	(See <a href="#">DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM]</a> .)

**PID/DATA Monitor Table**

PID name (definition)	Unit/Condition	Operation condition (reference)	Action	ABS HU/CM terminal



<b>ABS_VOLT</b> (System battery voltage value)	V	<ul style="list-style-type: none"> <li>Ignition switch at ON: <b>Approx. 12.2 V</b></li> <li>Idling: <b>Approx. 14.1 V</b></li> </ul>	Inspect the power supply circuit. (See <a href="#">ABS SYSTEM INSPECTION.</a> )	J
<b>ABSLF_I</b> (Left front inlet solenoid valve output state)	On/Off	<ul style="list-style-type: none"> <li>Solenoid valve activated: On</li> <li>Solenoid valve not activated: Off</li> </ul>	Inspect the ABS HU/CM. (See <a href="#">ABS HU/CM INSPECTION.</a> )	—
<b>ABSLF_O</b> (Left front outlet solenoid valve output state)	On/Off	<ul style="list-style-type: none"> <li>Solenoid valve activated: On</li> <li>Solenoid valve not activated: Off</li> </ul>	Inspect the ABS HU/CM. (See <a href="#">ABS HU/CM INSPECTION.</a> )	—
<b>ABSLR_I</b> (Left rear inlet solenoid valve output state)	On/Off	<ul style="list-style-type: none"> <li>Solenoid valve activated: On</li> <li>Solenoid valve not activated: Off</li> </ul>	Inspect the ABS HU/CM. (See <a href="#">ABS HU/CM INSPECTION.</a> )	—
<b>ABSLR_O</b> (Left rear outlet solenoid valve output state)	On/Off	<ul style="list-style-type: none"> <li>Solenoid valve activated: On</li> <li>Solenoid valve not activated: Off</li> </ul>	Inspect the ABS HU/CM. (See <a href="#">ABS HU/CM INSPECTION.</a> )	—
<b>ABSPMPRLY</b> (Motor relay output state)	On/Off	<ul style="list-style-type: none"> <li>Relay activated: On</li> <li>Relay not activated: Off</li> </ul>	Inspect the ABS HU/CM. (See <a href="#">ABS HU/CM INSPECTION.</a> )	—
<b>ABSRF_I</b> (Right front inlet solenoid valve output state)	On/Off	<ul style="list-style-type: none"> <li>Solenoid valve activated: On</li> <li>Solenoid valve not activated: Off</li> </ul>	Inspect the ABS HU/CM. (See <a href="#">ABS HU/CM INSPECTION.</a> )	—
<b>ABSRF_O</b> (Right front outlet solenoid valve output state)	On/Off	<ul style="list-style-type: none"> <li>Solenoid valve activated: On</li> <li>Solenoid valve not activated: Off</li> </ul>	Inspect the ABS HU/CM. (See <a href="#">ABS HU/CM INSPECTION.</a> )	—

valve output state)		not activated: Off	<b>INSPECTION.)</b>	
ABSRR_I (Right rear inlet solenoid valve output state)	On/Off	<ul style="list-style-type: none"> <li>Solenoid valve activated: On</li> <li>Solenoid valve not activated: Off</li> </ul>	Inspect the ABS HU/CM.  (See <b>ABS HU/CM INSPECTION.)</b>	—
ABSRR_O (Right rear outlet solenoid valve output state)	On/Off	<ul style="list-style-type: none"> <li>Solenoid valve activated: On</li> <li>Solenoid valve not activated: Off</li> </ul>	Inspect the ABS HU/CM.  (See <b>ABS HU/CM INSPECTION.)</b>	—
ABSVLVRLY (Fail-safe relay output state)	On/Off	<ul style="list-style-type: none"> <li>Fail-safe relay is activated: On</li> <li>Fail-safe relay is deactivated: Off</li> </ul>	Inspect ABS HU/CM.  (See <b>ABS HU/CM INSPECTION</b> )	—
BOO_ABS (Brake pedal switch input)	On/Off	<ul style="list-style-type: none"> <li>Brake pedal depressed: On</li> <li>Brake pedal released: Off</li> </ul>	Inspect the brake switch.	N
CCNTABS (Number of continuous codes)	—	<ul style="list-style-type: none"> <li>DTCs detected: <b>1—255</b></li> <li>No DTCs detected: <b>0</b></li> </ul>	Perform the DTC inspection.	—
LF_WSPD (Left front ABS wheel-speed sensor input)	KPH, MPH	<ul style="list-style-type: none"> <li>Vehicle stopped: <b>0 KPH, 0 MPH</b></li> <li>Vehicle running: Vehicle speed</li> </ul>	Inspect the ABS wheel-speed sensor.	E, F
LR_WSPD (Left rear ABS wheel-speed sensor input)	KPH, MPH	<ul style="list-style-type: none"> <li>Vehicle stopped: <b>0 KPH, 0 MPH</b></li> <li>Vehicle running: Vehicle speed</li> </ul>	Inspect the ABS wheel-speed sensor.	G, H

PMP_MOTOR (Pump motor output state)	On/Off	<ul style="list-style-type: none"> <li>Pump motor activated: On</li> <li>Pump motor not activated: Off</li> </ul>	Inspect the ABS HU/CM.  (See <a href="#">ABS HU/CM INSPECTION.</a> )	—
RF_WSPD (Right front ABS wheel-speed sensor input)	KPH, MPH	<ul style="list-style-type: none"> <li>Vehicle stopped: <b>0 KPH, 0 MPH</b></li> <li>Vehicle running: Vehicle speed</li> </ul>	Inspect the ABS wheel-speed sensor.	M, O
RR_WSPD (Right rear ABS wheel-speed sensor input)	KPH, MPH	<ul style="list-style-type: none"> <li>Vehicle stopped: <b>0 KPH, 0 MPH</b></li> <li>Vehicle running: Vehicle speed</li> </ul>	Inspect the ABS wheel-speed sensor.	I, L

Active Command Modes Table

Command name	Output part	Operation	Operating condition
LF_INLET	LF inlet solenoid valve	On/Off	Ignition switch at ON
LF_OUTLET	LF outlet solenoid valve		
LR_INLET	LR inlet solenoid valve		
LR_OUTLET	LR outlet solenoid valve		
PMP_MOTOR	Pump motor		
RF_INLET	RF inlet solenoid valve		
RF_OUTLET	RF outlet solenoid valve		
RR_INLET	RR inlet solenoid valve		
RR_OUTLET	RR outlet solenoid valve		

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## 2008 - MX-5 - Brakes

### DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254 [ABS]

DTC	C 1194	LF outlet solenoid valve system
	C 1198	LF inlet solenoid valve system
	C 1210	RF outlet solenoid valve system
	C 1214	RF inlet solenoid valve system
	C 1242	LR outlet solenoid valve system
	C 1246	RR outlet solenoid valve system
	C 1250	LR inlet solenoid valve system
	C 1254	RR inlet solenoid valve system
DETECTION CONDITION		<ul style="list-style-type: none"> <li>Solenoid valve operation does not correspond to solenoid ON/OFF commands from the ABS HU/CM.</li> </ul>
POSSIBLE CAUSE		<ul style="list-style-type: none"> <li>Open or short circuit in the ABS HU/CM internal solenoid valves</li> <li>Solenoid valve malfunction</li> <li>Poor connection at connectors (female terminal)</li> </ul>

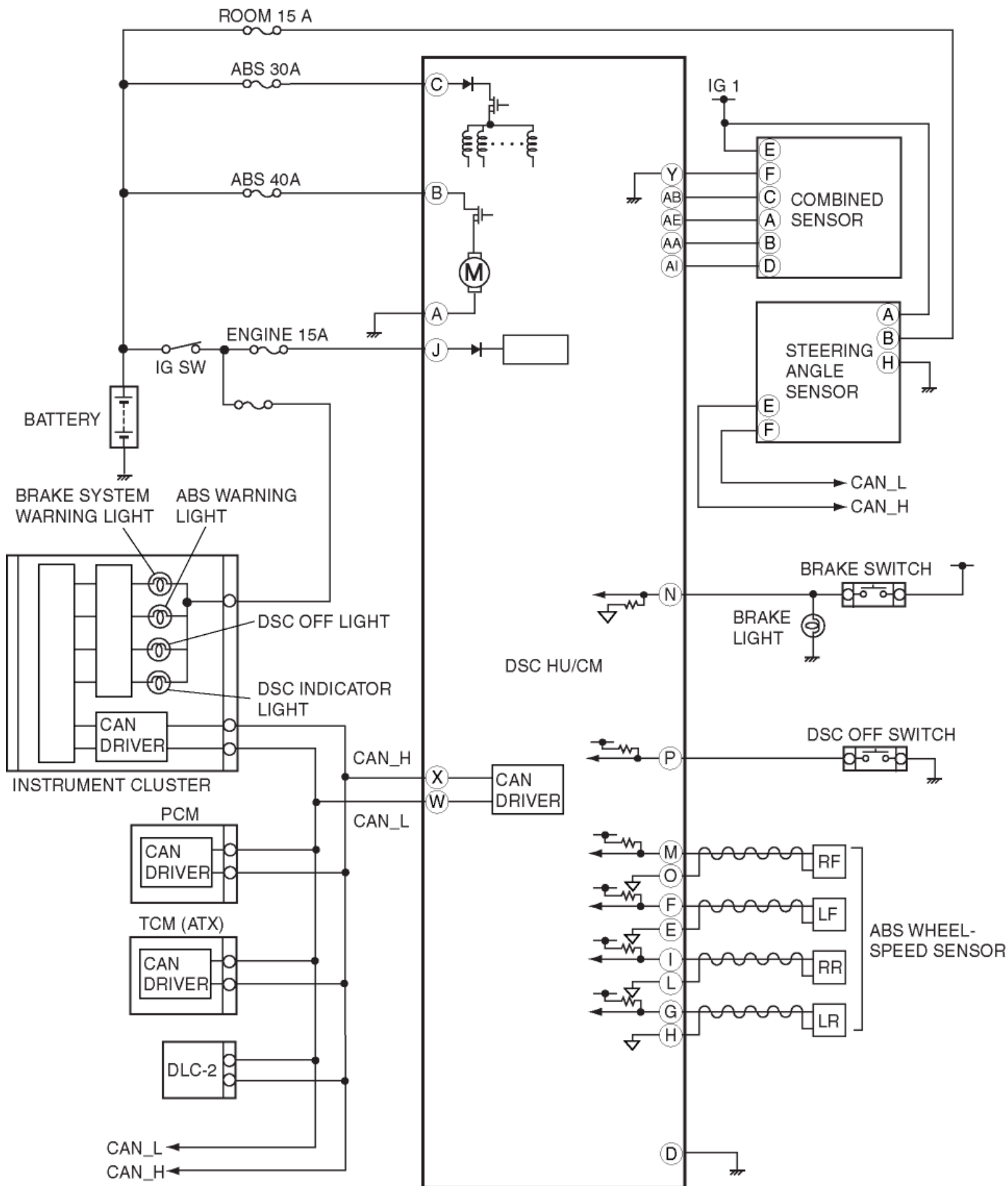
### Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>VERIFY SOLENOID VALVE OPERATION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Connect the M-MDS to the DLC-2.</li> <li>Turn the ignition switch to the ON position (engine off).</li> <li>Access the active command mode for the solenoid valve using the M-MDS.</li> <li>Does the solenoid valve operate?</li> </ul>	Yes	Go to the next step.
		No	Replace the ABS HU/CM, then go to the next step.  (See <a href="#">ABS HU/CM REMOVAL/INSTALLATION.</a> )
2	<b>VERIFY DTC TROUBLESHOOTING COMPLETED</b>	Yes	Repeat the inspection from Step 1.

	<ul style="list-style-type: none"> <li>• Clear the DTC from the memory. (See <a href="#">ON-BOARD DIAGNOSIS[ABS]</a>.)</li> <li>• Start the engine and drive the vehicle at <b>10 km/h {6.2 mph} or more.</b></li> <li>• Gradually slow down and stop vehicle.</li> <li>• Are the same DTCs present?</li> </ul>	<p>If the malfunction recurs, replace the ABS HU/CM, then go to the next step. (See <a href="#">ABS HU/CM REMOVAL/INSTALLATION</a>.)</p>
		No Go to the next step.
3	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Are any other DTCs present?</li> </ul>	<p>Yes Go to the applicable DTC inspection. (See <a href="#">ON-BOARD DIAGNOSIS[ABS]</a>.)</p>
		No DTC troubleshooting completed.

2008 - MX-5 - Brakes

DYNAMIC STABILITY CONTROL SYSTEM WIRING DIAGRAM [DYNAMIC STABILITY CONTROL (DSC)]







## 2008 - MX-5 - Brakes

### ON-BOARD DIAGNOSIS [DYNAMIC STABILITY CONTROL (DSC)]

#### On-Board Diagnostic (OBD) Test Description

- The OBD test inspects the integrity and function of the DSC and outputs the results when requested by the specific tests.
- On-board diagnostic test also:
  - Provides a quick inspection of the DSC usually performed at the start of each diagnostic procedure.
  - Provides verification after repairs to ensure that no other faults occurred during service.
- The OBD test is divided into 3 tests:
  - Read/clear diagnostic results, PID monitor and record and active command modes.

#### Read/clear diagnostic results

- This function allows you to read or clear DTCs in the DSC HU/CM memory.

#### PID/Data monitor and record

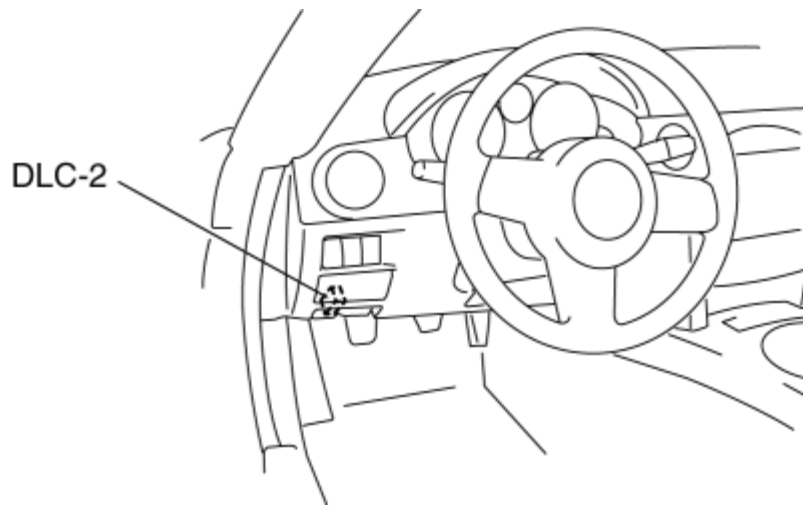
- This function allows you to access certain data values, input signals, calculated values, and system status information.

#### Active command modes

- This function allows you to control devices through the M-MDS.

#### Reading DTCs Procedure

1. Connect M-MDS to the vehicle DLC 2 connector.



2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.

- When using the IDS (laptop PC)
  1. Select the "Toolbox" tab.
  2. Select "Self Test".
  3. Select "Modules".
  4. Select "ABS".
- When using the PDS (Pocket PC)
  1. Select "Module Tests".
  2. Select "ABS".
  3. Select "Self Test".

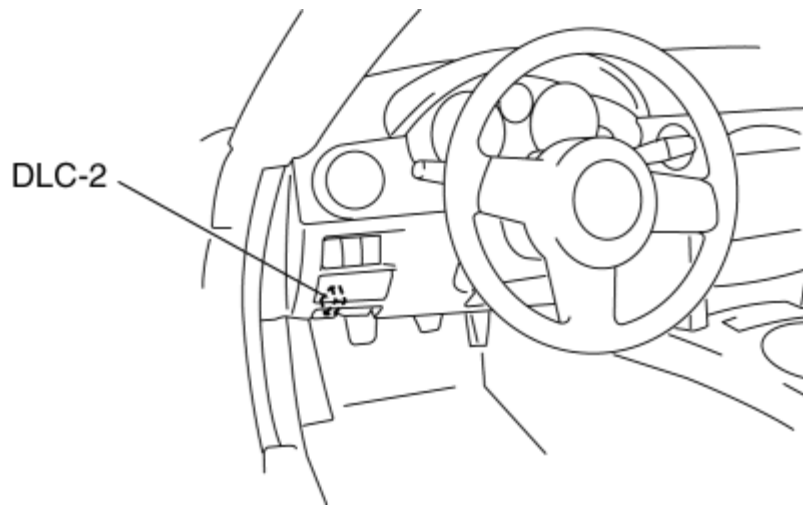
3. Verify the DTC according to the directions on the screen.

- If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.

4. After completion of repairs, clear all DTCs stored in the DSC. (See [Clearing DTCs Procedures](#).)

## Clearing DTCs Procedures

1. Connect the M-MDS to the DLC 2 connector.



2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.

- When using the IDS (laptop PC)
  1. Select the "Toolbox" tab.
  2. Select "Self Test".
  3. Select "Modules".
  4. Select "ABS".
- When using the PDS (Pocket PC)
  1. Select "Module Tests".
  2. Select "ABS".
  3. Select "Self Test".

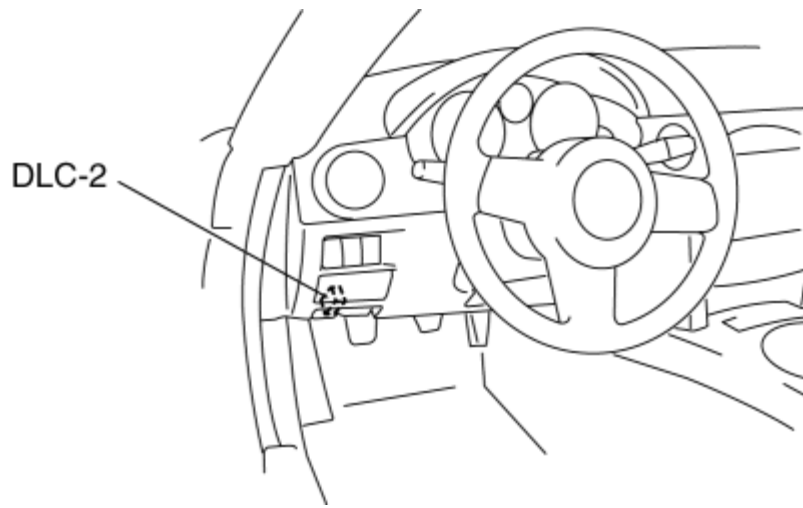
3. Verify the DTC according to the directions on the screen.

4. Press the clear button on the DTC screen to clear the DTC.

5. Verify that no DTCs are displayed.

### **PID/Data Monitor and Record Procedure**

1. Connect M-MDS to the vehicle DLC 2 connector.



2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.

- When using the IDS (laptop PC)
  1. Select the "Toolbox" tab.
  2. Select "DataLogger".
  3. Select "Modules".
  4. Select "ABS".
- When using the PDS (Pocket PC)
  1. Select "Module Tests".
  2. Select "ABS".
  3. Select "DataLogger".

3. Select the applicable PID from the PID table.

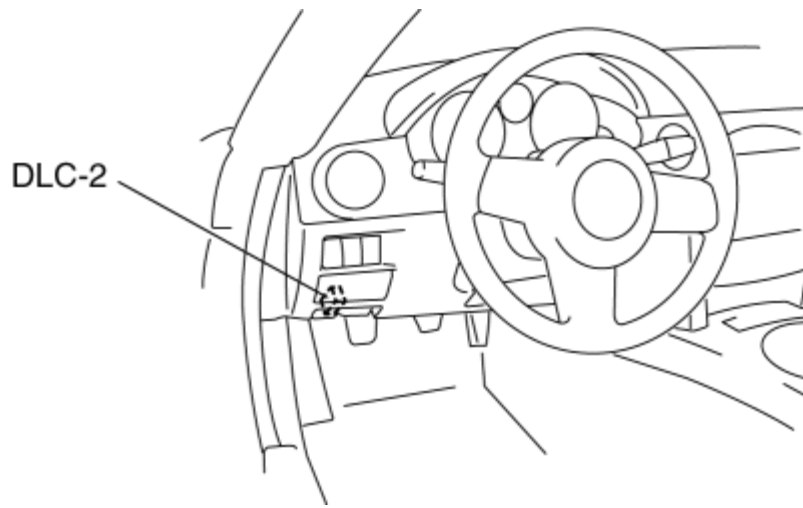
4. Verify the PID data according to the directions on the screen.

#### **NOTE:**

- The PID/Data monitor function is used for monitoring the calculated value. Therefore, if the monitored value of the output parts is not within the specification, inspection of the monitored value of input parts corresponding to applicable output part control is necessary. In addition, because the system does not display output part malfunction as abnormality in the monitored value, it is necessary to inspect the output part individually using a active command modes function.

#### **Active Command Modes Procedure**

1. Connect M-MDS to the vehicle DLC 2 connector.



2. After the vehicle is identified, select the following items from the initial screen of the M-MDS.

- When using the IDS (laptop PC)
  1. Select the "Toolbox" tab.
  2. Select "DataLogger".
  3. Select "Modules".
  4. Select "ABS".
- When using the PDS (Pocket PC)
  1. Select "Module Tests".
  2. Select "ABS".
  3. Select "DataLogger".

3. Select the active command modes from the PID table.

4. Perform the active command modes, inspect the operations for each parts.

- If there is no operation sound from the relay, motor, and solenoid after the active command mode inspection is performed, it is possible that there is an open or short circuit in the wiring harness, relay, motor or solenoid, or sticking and operation malfunction.

## DTC Table

DTC	System malfunction location	Page
M-MDS		
B1317	Power supply system	(See <b>DTC B1317, B1318 [DYNAMIC STABILITY CONTROL (DSC)]</b> .)

B1318	Power supply system	(See <a href="#">DTC B1317, B1318 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
B1342	DSC HU/CM system	(See <a href="#">DTC B1342, C1730 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
B1484	Brake switch system	(See <a href="#">DTC B1484, C1954 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
B2477	DSC HU/CM configuration	(See <a href="#">DTC B2477 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
B2900	Incorrect DSC HU/CM installed	(See <a href="#">DTC B2900, C1805 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
C1093	DSC OFF switch system	(See <a href="#">DTC C1093 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
C1095	Pump motor, motor relay system	(See <a href="#">DTC C1095, C1096 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
C1096	Pump motor, motor relay system	(See <a href="#">DTC C1095, C1096 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
C1134	PCM, TCM communication system	(See <a href="#">DTC C1134 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
C1141	LF ABS sensor rotor system	(See <a href="#">DTC C1141, C1142, C1143, C1144 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
C1142	RF ABS sensor rotor system	(See <a href="#">DTC C1141, C1142, C1143, C1144 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
C1143	LR ABS sensor rotor system	(See <a href="#">DTC C1141, C1142, C1143, C1144 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
C1144	RR ABS sensor rotor system	(See <a href="#">DTC C1141, C1142, C1143, C1144 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
C1145	RF ABS wheel-speed sensor (open circuit) system	(See <a href="#">DTC C1145, C1155, C1165, C1175 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
C1148	RF ABS wheel-speed sensor/ABS sensor rotor system	(See <a href="#">DTC C1148, C1158, C1168, C1178 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
C1155	LF ABS wheel-speed sensor (open circuit) system	(See <a href="#">DTC C1145, C1155, C1165, C1175 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
C1158	LF ABS wheel-speed sensor/ABS sensor rotor system	(See <a href="#">DTC C1148, C1158, C1168, C1178 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)

C1165	RR ABS wheel-speed sensor (open circuit) system	(See <a href="#">DTC C1145, C1155, C1165, C1175 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
C1168	RR ABS wheel-speed sensor/ABS sensor rotor system	(See <a href="#">DTC C1148, C1158, C1168, C1178 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
C1175	LR ABS wheel-speed sensor (open circuit) system	(See <a href="#">DTC C1145, C1155, C1165, C1175 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
C1178	LR ABS wheel-speed sensor/ABS sensor rotor system	(See <a href="#">DTC C1148, C1158, C1168, C1178 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
C1186	Valve relay system	(See <a href="#">DTC C1186, C1266 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
C1194	LF outlet solenoid valve system	(See <a href="#">DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254, C1400, C1410, C1957, C1958 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
C1198	LF inlet solenoid valve system	(See <a href="#">DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254, C1400, C1410, C1957, C1958 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
C1210	RF outlet solenoid valve system	(See <a href="#">DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254, C1400, C1410, C1957, C1958 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
C1214	RF inlet solenoid valve system	(See <a href="#">DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254, C1400, C1410, C1957, C1958 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
C1222	ABS wheel-speed sensor (slip monitor) system	(See <a href="#">DTC C1222 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
C1233	LF ABS wheel-speed sensor (short to ground) system	(See <a href="#">DTC C1233, C1234, C1235, C1236 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
C1234	RF ABS wheel-speed sensor (short to ground) system	(See <a href="#">DTC C1233, C1234, C1235, C1236 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
C1235	RR ABS wheel-speed sensor (short to ground) system	(See <a href="#">DTC C1233, C1234, C1235, C1236 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
C1236	LR ABS wheel-speed sensor (short to ground) system	(See <a href="#">DTC C1233, C1234, C1235, C1236 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
C1242	LR outlet solenoid valve system	(See <a href="#">DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254, C1400, C1410, C1957, C1958 [DYNAMIC STABILITY CONTROL (DSC)]</a> .)
C1246	RR outlet solenoid valve	(See <a href="#">DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254,</a>



	system	<b>C1400, C1410, C1957, C1958 [DYNAMIC STABILITY CONTROL (DSC)].)</b>
C1250	LR inlet solenoid valve system	(See <b>DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254, C1400, C1410, C1957, C1958 [DYNAMIC STABILITY CONTROL (DSC)].)</b> )
C1254	RR inlet solenoid valve system	(See <b>DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254, C1400, C1410, C1957, C1958 [DYNAMIC STABILITY CONTROL (DSC)].)</b> )
C1266	Valve relay system	(See <b>DTC C1186, C1266 [DYNAMIC STABILITY CONTROL (DSC)].)</b> )
C1279	Combined sensor system	(See <b>DTC C1279, C1280, C1281, C1282, C1951, C1952, C1959, C2768 [DYNAMIC STABILITY CONTROL (DSC)].)</b> )
C1280	Combined sensor system	(See <b>DTC C1279, C1280, C1281, C1282, C1951, C1952, C1959, C2768 [DYNAMIC STABILITY CONTROL (DSC)].)</b> )
C1281	Combined sensor system	(See <b>DTC C1279, C1280, C1281, C1282, C1951, C1952, C1959, C2768 [DYNAMIC STABILITY CONTROL (DSC)].)</b> )
C1282	Combined sensor system	(See <b>DTC C1279, C1280, C1281, C1282, C1951, C1952, C1959, C2768 [DYNAMIC STABILITY CONTROL (DSC)].)</b> )
C1288	Brake fluid pressure sensor system	(See <b>DTC C1288, C1290, C1953 [DYNAMIC STABILITY CONTROL (DSC)].)</b> )
C1290	Brake fluid pressure sensor system	(See <b>DTC C1288, C1290, C1953 [DYNAMIC STABILITY CONTROL (DSC)].)</b> )
C1295	Steering angle sensor system	(See <b>DTC C1295, C1307, C1937, C1938, C1956 [DYNAMIC STABILITY CONTROL (DSC)].)</b> )
C1306	Steering angle sensor (abnormal initialization) system	(See <b>DTC C1306 [DYNAMIC STABILITY CONTROL (DSC)].)</b> )
C1307	Steering angle sensor system	(See <b>DTC C1295, C1307, C1937, C1938, C1956 [DYNAMIC STABILITY CONTROL (DSC)].)</b> )
C1400	RF traction control solenoid valve system	(See <b>DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254, C1400, C1410, C1957, C1958 [DYNAMIC STABILITY CONTROL (DSC)].)</b> )
C1410	LF traction control solenoid valve system	(See <b>DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254, C1400, C1410, C1957, C1958 [DYNAMIC STABILITY CONTROL (DSC)].)</b> )
C1730	DSC HU/CM system	(See <b>DTC B1342, C1730 [DYNAMIC STABILITY CONTROL (DSC)].)</b> )
C1805	Incorrect DSC HU/CM	(See <b>DTC B2900, C1805 [DYNAMIC STABILITY CONTROL (DSC)].)</b> )

	installed	
C1937	Steering angle sensor system	(See <b>DTC C1295, C1307, C1937, C1938, C1956 [DYNAMIC STABILITY CONTROL (DSC)]</b> .)
C1938	Steering angle sensor system	(See <b>DTC C1295, C1307, C1937, C1938, C1956 [DYNAMIC STABILITY CONTROL (DSC)]</b> .)
C1951	Combined sensor system	(See <b>DTC C1279, C1280, C1281, C1282, C1951, C1952, C1959, C2768 [DYNAMIC STABILITY CONTROL (DSC)]</b> .)
C1952	Combined sensor system	(See <b>DTC C1279, C1280, C1281, C1282, C1951, C1952, C1959, C2768 [DYNAMIC STABILITY CONTROL (DSC)]</b> .)
C1953	Brake fluid pressure sensor system	(See <b>DTC C1288, C1290, C1953 [DYNAMIC STABILITY CONTROL (DSC)]</b> .)
C1954	Brake switch system	(See <b>DTC B1484, C1954 [DYNAMIC STABILITY CONTROL (DSC)]</b> .)
C1956	Steering angle sensor system	(See <b>DTC C1295, C1307, C1937, C1938, C1956 [DYNAMIC STABILITY CONTROL (DSC)]</b> .)
C1957	RF DSC switch solenoid valve system	(See <b>DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254, C1400, C1410, C1957, C1958 [DYNAMIC STABILITY CONTROL (DSC)]</b> .)
C1958	LF DSC switch solenoid valve system	(See <b>DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254, C1400, C1410, C1957, C1958 [DYNAMIC STABILITY CONTROL (DSC)]</b> .)
C1959	Combined sensor system	(See <b>DTC C1279, C1280, C1281, C1282, C1951, C1952, C1959, C2768 [DYNAMIC STABILITY CONTROL (DSC)]</b> .)
C1994	DSC control system	(See <b>DTC C1994 [DYNAMIC STABILITY CONTROL (DSC)]</b> .)
C2768	Combined sensor system	(See <b>DTC C1279, C1280, C1281, C1282, C1951, C1952, C1959, C2768 [DYNAMIC STABILITY CONTROL (DSC)]</b> .)
U0073	CAN system communication error	(See <b>DTC TABLE [MULTIPLEX COMMUNICATION SYSTEM]</b> .)
U0100	Communication error to PCM	(See <b>DTC TABLE [MULTIPLEX COMMUNICATION SYSTEM]</b> .)
U0101	Communication error to TCM	(See <b>DTC TABLE [MULTIPLEX COMMUNICATION SYSTEM]</b> .)
U0155	Communication error to instrument cluster	(See <b>DTC TABLE [MULTIPLEX COMMUNICATION SYSTEM]</b> .)

U1900	Communication error to other module	(See <b>DTC TABLE [MULTIPLEX COMMUNICATION SYSTEM]</b> .)
U2023	Abnormal message from PCM	(See <b>DTC TABLE [MULTIPLEX COMMUNICATION SYSTEM]</b> .)

## PID/DATA Monitor Table

PID name (definition)	Unit/Condition	Operation condition (reference)	Action	DSC HU/CM terminal
ABS_VOLT (System battery voltage value)	V	<ul style="list-style-type: none"> <li>Ignition switch at ON: <b>Approx. 12.2 V</b></li> <li>Idling: <b>Approx. 14.1 V</b></li> </ul>	Inspect power supply circuit.  (See <b>DSC SYSTEM INSPECTION.</b> )	J
ABSLF_I (Left front inlet solenoid valve output state)	On/Off	<ul style="list-style-type: none"> <li>Solenoid valve activated: On</li> <li>Solenoid valve not activated: Off</li> </ul>	Inspect the DSC HU/CM.  (See <b>DSC HU/CM INSPECTION.</b> )	—
ABSLF_O (Left front outlet solenoid valve output state)	On/Off	<ul style="list-style-type: none"> <li>Solenoid valve activated: On</li> <li>Solenoid valve not activated: Off</li> </ul>	Inspect the DSC HU/CM.  (See <b>DSC HU/CM INSPECTION.</b> )	—
ABSLR_I (Left rear inlet solenoid valve output state)	On/Off	<ul style="list-style-type: none"> <li>Solenoid valve activated: On</li> <li>Solenoid valve not activated: Off</li> </ul>	Inspect the DSC HU/CM.  (See <b>DSC HU/CM INSPECTION.</b> )	—
ABSLR_O (Left rear outlet solenoid valve output state)	On/Off	<ul style="list-style-type: none"> <li>Solenoid valve activated: On</li> <li>Solenoid valve not activated: Off</li> </ul>	Inspect the DSC HU/CM.  (See <b>DSC HU/CM INSPECTION.</b> )	—
ABSPMPRLY (Motor relay output state)	On/Off	<ul style="list-style-type: none"> <li>Relay activated: On</li> <li>Relay not activated: Off</li> </ul>	Inspect the DSC HU/CM.  (See <b>DSC HU/CM INSPECTION.</b> )	—

<p>ABSRF_I</p> <p>(Right front inlet solenoid valve output state)</p>	On/Off	<ul style="list-style-type: none"> <li>• Solenoid valve activated: On</li> <li>• Solenoid valve not activated: Off</li> </ul>	<p>Inspect the DSC HU/CM.</p> <p>(See <b>DSC HU/CM INSPECTION.</b>)</p>	—
<p>ABSRF_O</p> <p>(Right front outlet solenoid valve output state)</p>	On/Off	<ul style="list-style-type: none"> <li>• Solenoid valve activated: On</li> <li>• Solenoid valve not activated: Off</li> </ul>	<p>Inspect the DSC HU/CM.</p> <p>(See <b>DSC HU/CM INSPECTION.</b>)</p>	—
<p>ABSRR_I</p> <p>(Right rear inlet solenoid valve output state)</p>	On/Off	<ul style="list-style-type: none"> <li>• Solenoid valve activated: On</li> <li>• Solenoid valve not activated: Off</li> </ul>	<p>Inspect the DSC HU/CM.</p> <p>(See <b>DSC HU/CM INSPECTION.</b>)</p>	—
<p>ABSRR_O</p> <p>(Right rear outlet solenoid valve output state)</p>	On/Off	<ul style="list-style-type: none"> <li>• Solenoid valve activated: On</li> <li>• Solenoid valve not activated: Off</li> </ul>	<p>Inspect the DSC HU/CM.</p> <p>(See <b>DSC HU/CM INSPECTION.</b>)</p>	—
<p>ABSVLVRLY</p> <p>(Fail-safe relay output state)</p>	On/Off	<ul style="list-style-type: none"> <li>• Fail-safe relay is activated: On</li> <li>• Fail-safe relay is deactivated: Off</li> </ul>	<p>Inspect DSC HU/CM.</p> <p>(See <b>DSC HU/CM INSPECTION</b>)</p>	—
<p>BOO_ABS</p> <p>(Brake pedal switch input)</p>	On/Off	<ul style="list-style-type: none"> <li>• Brake pedal depressed: On</li> <li>• Brake pedal released: Off</li> </ul>	<p>Inspect the brake switch.</p>	N
<p>CCNTABS</p> <p>(Number of continuous codes)</p>	—	<ul style="list-style-type: none"> <li>• DTCs detected: <b>1—255</b></li> <li>• No DTCs detected: <b>0</b></li> </ul>	<p>Perform the DTC inspection.</p>	—
<p>LAT_ACCL</p>	G	<ul style="list-style-type: none"> <li>• Vehicle stopped or driving at constant speed: <b>0 G</b></li> <li>• Cornering to right: Changes <b>0 G—positive</b></li> <li>• Cornering to left: Changes <b>0 G—negative</b></li> </ul>	<p>Inspect the combined sensor.</p>	AI

LF_WSPD (Left front ABS wheel-speed sensor input)	KPH, MPH	<ul style="list-style-type: none"> <li>Vehicle stopped: <b>0 KPH, 0 MPH</b></li> <li>Vehicle running: vehicle speed</li> </ul>	Inspect the ABS wheel-speed sensor.	F, E
LR_WSPD (Left rear ABS wheel-speed sensor input)	KPH, MPH	<ul style="list-style-type: none"> <li>Vehicle stopped: <b>0 KPH, 0 MPH</b></li> <li>Vehicle running: Vehicle speed</li> </ul>	Inspect the ABS wheel-speed sensor.	G, H
MCYLI P	Pa, psi	<ul style="list-style-type: none"> <li>Brake pedal depressed: Changes according to the brake fluid pressure</li> </ul>	Inspect the brake fluid pressure sensor.	—
PMP_MOTOR (Pump motor output state)	On/Off	<ul style="list-style-type: none"> <li>Pump motor activated: On</li> <li>Pump motor not activated: Off</li> </ul>	Inspect the DSC HU/CM.  (See <b>DSC HU/CM INSPECTION</b> .)	—
RF_WSPD (Right front ABS wheel-speed sensor input)	KPH, MPH	<ul style="list-style-type: none"> <li>Vehicle stopped: <b>0 KPH, 0 MPH</b></li> <li>Vehicle running: vehicle speed</li> </ul>	Inspect the ABS wheel-speed sensor.	M, O
RPM (Engine speed signal input)	RPM	<ul style="list-style-type: none"> <li>Engine stopped: <b>0 RPM</b></li> <li>Engine speed at 3,000 rpm: <b>3,000 RPM</b></li> </ul>	Inspect the PCM.  Inspect the instrument cluster.	—
RR_WSPD (Right rear ABS wheel-speed sensor input)	KPH, MPH	<ul style="list-style-type: none"> <li>Vehicle stopped: <b>0 KPH, 0 MPH</b></li> <li>Vehicle running: Vehicle speed</li> </ul>	Inspect the ABS wheel-speed sensor.	I, L
SWA_POS	°	<ul style="list-style-type: none"> <li>Steering wheel in neutral position (not turned): <b>0°</b></li> <li>Steering wheel turned to left: Changes <b>0°—negative</b></li> <li>Steering wheel turned to right: Changes <b>0°—positive</b></li> </ul>	Inspect the steering angle sensor.	—
		<ul style="list-style-type: none"> <li>Closed throttle</li> </ul>		

TPI	%	position: <b>0%</b> <ul style="list-style-type: none"> <li>• Wide open throttle: Changes according to throttle valve opening angle</li> </ul>	Inspect the throttle position sensor.	—
V_STB_L (LF stability control solenoid valve output state)	On/Off	<ul style="list-style-type: none"> <li>• Solenoid valve activated: On</li> <li>• Solenoid valve not activated: Off</li> </ul>	Inspect the DSC HU/CM. (See <b>DSC HU/CM INSPECTION.</b> )	—
V_STB_R (RF stability control solenoid valve output state)	On/Off	<ul style="list-style-type: none"> <li>• Solenoid valve activated: On</li> <li>• Solenoid valve not activated: Off</li> </ul>	Inspect the DSC HU/CM. (See <b>DSC HU/CM INSPECTION.</b> )	—
V_TRC_L (LF traction control solenoid valve output state)	On/Off	<ul style="list-style-type: none"> <li>• Solenoid valve activated: On</li> <li>• Solenoid valve not activated: Off</li> </ul>	Inspect the DSC HU/CM. (See <b>DSC HU/CM INSPECTION.</b> )	—
V_TRC_R (RF traction control solenoid valve output state)	On/Off	<ul style="list-style-type: none"> <li>• Solenoid valve activated: On</li> <li>• Solenoid valve not activated: Off</li> </ul>	Inspect the DSC HU/CM. (See <b>DSC HU/CM INSPECTION.</b> )	—
YAW_RATE	°/s	<ul style="list-style-type: none"> <li>• Vehicle stopped or driving straight: <b>0 °/s</b></li> <li>• Cornering to left: Changes <b>0 °/s—negative</b></li> <li>• Cornering to right: Changes <b>0 °/s—positive</b></li> </ul>	Inspect the combined sensor.	AA

### Active Command Modes Table

Command name	Output part	Operation	Operating condition
LATACCEL	Combined sensor (lateral acceleration) initialization	FALSE/TRUE	

LF_INLET	LF inlet solenoid valve	On/Off	Ignition switch at ON
LF_OUTLET	LF outlet solenoid valve		
LR_INLET	LR inlet solenoid valve		
LR_OUTLET	LR outlet solenoid valve		
PMP_MOTOR	Pump motor		
RF_INLET	RF inlet solenoid valve		
RF_OUTLET	RF outlet solenoid valve		
RR_INLET	RR inlet solenoid valve		
RR_OUTLET	RR outlet solenoid valve		
SAS_CAL	Steering angle sensor initialization	FALSE/TRUE	
STAB_IND	DSC indicator light	On/Off	
TRAC OFF	DSC OFF light		
V_STB_L	LF stability control solenoid valve		
V_STB_R	RF stability control solenoid valve		
V_TRC_L	LF traction control solenoid valve		
V_TRC_R	RF traction control solenoid valve		
YAWRATE	Combined sensor (yaw rate) initialization		

2008 - MX-5 - Brakes

DTC B1317, B1318 [DYNAMIC STABILITY CONTROL (DSC)]

DTC	B1317, B1318	Power supply system
DETECTION CONDITION	<ul style="list-style-type: none"><li>• B1317<ul style="list-style-type: none"><li>▪ The voltage at DSC HU/CM terminal J is <b>16.8 V</b> or more.</li></ul></li><li>• B1318<ul style="list-style-type: none"><li>▪ The vehicle speed exceeds <b>6 km/h</b> and the voltage at ABS HU/CM terminal J is less than <b>9.6 V</b></li></ul></li></ul>	
	POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• ENGINE 15 A fuse malfunction</li><li>• Open circuit or short to ground in the wiring harness between the DSC HU/CM terminal J and the battery</li><li>• Open circuit or faulty ground in the wiring harness between the DSC HU/CM terminal D and the body ground</li><li>• Battery deterioration</li><li>• Generator malfunction</li><li>• Poor connection at connectors (female terminal)</li></ul>

DSC HU/CM WIRING HARNESS-SIDE CONNECTOR

AS	AQ	AO	AM	AK	AI	AG	AE	AC	AA	Y	W	U	S	Q	O	M	K	I	G	E	<div>D C B A</div>			
AT	AR	AP	AN	AL	AJ	AH	AF	AD	AB	Z	X	V	T	R	P	N	L	J	H	F				

Diagnostic procedure

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STEP	INSPECTION	ACTION
1	<b>INSPECT BATTERY VOLTAGE</b> <ul style="list-style-type: none"> <li>Is the battery terminal voltage normal?</li> </ul>	Yes Make sure that battery terminal connection is normal. Go to the next step.
		No Charge or replace the battery, then go to Step 6. (See <a href="#">BATTERY RECHARGING [LF].</a> ) (See <a href="#">BATTERY REMOVAL/INSTALLATION [LF].</a> )
2	<b>INSPECT BATTERY GRAVITY</b> <ul style="list-style-type: none"> <li>Is battery specific gravity as specified?</li> </ul>	Yes Go to the next step.
		No Replace the battery, then go to Step 6. (See <a href="#">BATTERY REMOVAL/INSTALLATION [LF].</a> )
3	<b>INSPECT CHARGING SYSTEM</b> <ul style="list-style-type: none"> <li>Are the generator and drive belt tensions normal?</li> </ul>	Yes Go to the next step.
		No Replace generator and/or drive belt as necessary, then go to Step 6. (See <a href="#">DRIVE BELT REPLACEMENT [LF].</a> ) (See <a href="#">GENERATOR REMOVAL/INSTALLATION [LF].</a> )
4	<b>INSPECT ABS HU/CM POWER SUPPLY FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Start the engine.</li> <li>Measure the voltage between DSC HU/CM terminal J and ground.</li> <li>Is the voltage <b>approx. 10 V</b>?</li> </ul>	Yes Go to the next step.
		No Repair or replace the wiring harness for open circuit between the DSC HU/CM and ground, then go to Step 6.
5	<b>INSPECT DSC HU/CM GROUND FOR POOR GROUND OR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Measure the resistance between ground and DSC HU/CM terminal D.</li> <li>Is the resistance <b>within 0—1 ohm</b>?</li> </ul>	Yes Go to the next step.
		No If there is no continuity: <ul style="list-style-type: none"> <li>Repair or replace the wiring harness for open circuit between the DSC HU/CM and ground, then go to the next step.</li> </ul> If the resistance is not <b>within 0—1 ohm</b> : <ul style="list-style-type: none"> <li>Repair or replace the wiring harness for poor ground, then go to the next step.</li> </ul>
6	<b>VERIFY TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the memory. (See <a href="#">ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].</a>)</li> <li>Start the engine and drive the vehicle at <b>10 km/h {6.2 mph} or more</b>.</li> <li>Is the same DTC present?</li> </ul>	Yes Replace the DSC HU/CM, then go to the next step. (See <a href="#">DSC HU/CM REMOVAL/INSTALLATION.</a> )
		No Go to the next step.

7	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Are any other DTCs present?</li></ul>		
		Yes	Go to the applicable DTC inspection. (See <a href="#">ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</a> .)
		No	DTC troubleshooting completed.

## 2008 - MX-5 - Brakes

### DTC B1342, C1730 [DYNAMIC STABILITY CONTROL (DSC)]

DTC	B1342, C1730	DSC HU/CM system
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>• B1342 <ul style="list-style-type: none"> <li>▪ The DSC HU/CM on-board diagnostic function detects control module malfunction.</li> </ul> </li> <li>• C1730 <ul style="list-style-type: none"> <li>▪ Excess current is detected in the power supply circuit of the ABS wheel-speed sensor.</li> </ul> </li> </ul>	
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• DSC HU/CM internal malfunction</li> </ul>	

### Diagnostic procedure

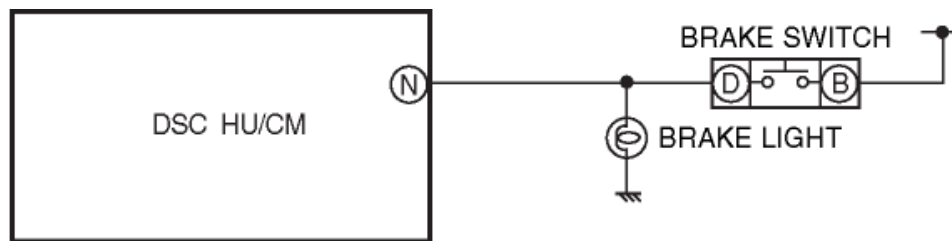
STEP	INSPECTION	ACTION
1	<b>VERIFY CURRENT STATUS OF MALFUNCTION</b> <ul style="list-style-type: none"> <li>• Clear the DTC from the memory. (See <a href="#">ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</a>.)</li> <li>• Start the engine and drive the vehicle at <b>10 km/h {6.2 mph} or more</b>.</li> <li>• Is the same DTC present?</li> </ul>	Yes Replace the DSC HU/CM, then go to the next step. (See <a href="#">DSC HU/CM REMOVAL/INSTALLATION</a> .)
		No Go to the next step.
2	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Are any other DTCs present?</li> </ul>	Yes Go to the applicable DTC inspection. (See <a href="#">ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</a> .)
		No DTC troubleshooting completed.



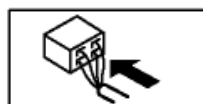
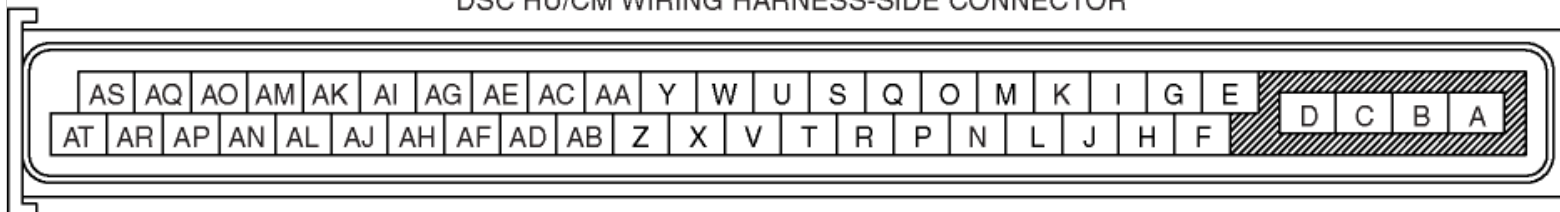
2008 - MX-5 - Brakes

DTC B1484, C1954 [DYNAMIC STABILITY CONTROL (DSC)]

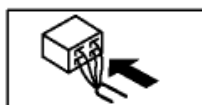
DTC	B1484, C1954	Brake switch system
DETECTION CONDITION	<ul style="list-style-type: none"><li>• B1484<ul style="list-style-type: none"><li>▪ Open circuit in the wiring harness between the DSC HU/CM terminal and the brake switch terminal</li></ul></li><li>• C1954<ul style="list-style-type: none"><li>▪ Brake switch ON signal is not input when the brake fluid pressure sensor signal reaches the specified value.</li><li>▪ Brake switch ON signal is input even if the signal from the brake fluid pressure sensor is less than the specification.</li></ul></li></ul>	
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Brake switch malfunction</li><li>• Open circuit in the wiring harness between the DSC HU/CM terminal N and the brake switch terminal D</li></ul>	



DSC HU/CM WIRING HARNESS-SIDE CONNECTOR



BRAKE SWITCH WIRING HARNESS-SIDE CONNECTOR



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT DSC HU/CM TO BRAKE SWITCH FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the DSC HU/CM and brake switch connector.</li> <li>Inspect for continuity DSC HU/CM terminal N and brake switch terminal D.</li> <li>Is there continuity?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Repair or replace the wiring harness for open circuit between DSC HU/CM and brake switch, then go to the next step.</p>
2	<b>INSPECT BRAKE SWITCH</b> <ul style="list-style-type: none"> <li>Inspect the brake switch. (See <a href="#">BRAKE SWITCH INSPECTION</a>.)</li> <li>Is the brake switch normal?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Replace the brake switch, then go to the next step. (See <a href="#">BRAKE PEDAL REMOVAL/INSTALLATION</a>.)</p>
3	<b>VERIFY TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the memory.</li> </ul>	<p>Yes Replace the DSC HU/CM, then go to the next step. (See <a href="#">DSC HU/CM REMOVAL/INSTALLATION</a>.)</p> <p>No Go to the next step.</p>

	(See <b>ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</b> .)  • Are the same DTCs present?		
4	<b>VERIFY AFTER REPAIR PROCEDURE</b>  • Are any other DTC present?	Yes	Go to the applicable DTC inspection.  (See <b>ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</b> .)
		No	DTC troubleshooting completed.

## 2008 - MX-5 - Brakes

### DTC B2477 [DYNAMIC STABILITY CONTROL (DSC)]

DTC	B2477	DSC HU/CM configuration
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>Configuration setting failure is detected.</li> </ul>	
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Module configuration procedure was not completed properly.</li> </ul>	

#### Diagnostic procedure

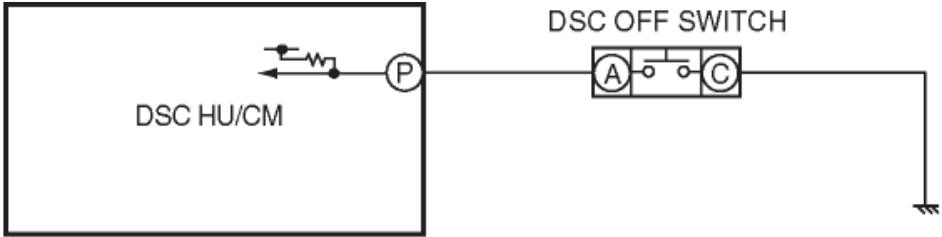
STEP	INSPECTION	ACTION
1	<b>VERIFY CONFIGURATION</b> <ul style="list-style-type: none"> <li>Has the DSC HU/CM configuration been performed?</li> </ul>	Yes Go to the next step.
		No Perform configuration using the M-MDS. (See <a href="#">DSC CONFIGURATION</a> .)
2	<b>VERIFY DTC TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"> <li>Clear the DTC from the memory. (See <a href="#">ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</a>.)</li> <li>Is the same DTC present?</li> </ul>	Yes Repeat the inspection from Step 1.  If the malfunction recurs, replace the DSC HU/CM, then go to the next step. (See <a href="#">DSC HU/CM REMOVAL/INSTALLATION</a> .)
		No Go to the next step.
3	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Are any other DTCs present?</li> </ul>	Yes Go to the applicable DTC inspection. (See <a href="#">ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</a> .)
		No DTC troubleshooting completed.



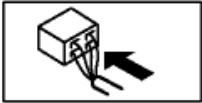
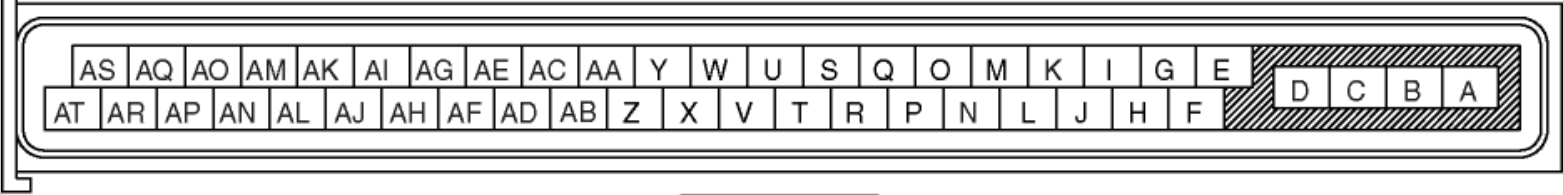
2008 - MX-5 - Brakes

DTC C1093 [DYNAMIC STABILITY CONTROL (DSC)]

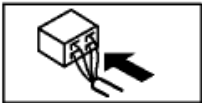
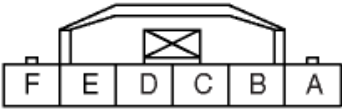
DTC	C1093	DSC OFF switch system
DETECTION CONDITION	<ul style="list-style-type: none"><li>Continuous ON signal from the DSC OFF switch for <b>5 s or more</b> is detected.</li></ul>	
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>The driver pressed and held the DSC OFF switch for <b>5 s or more</b>.</li><li>Short to ground in the wiring harness between the DSC HU/CM terminal P and the DSC OFF switch terminal A</li><li>DSC OFF switch malfunction</li></ul>	



DSC HU/CM WIRING HARNESS-SIDE CONNECTOR



DSC OFF SWITCH WIRING HARNESS-SIDE CONNECTOR



Diagnostic procedure

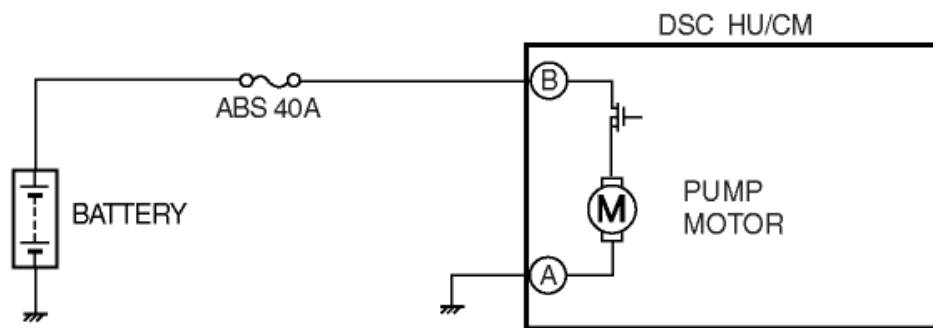
STEP	INSPECTION	ACTION
	INSPECT DSC HU/CM TO DSC OFF	

1	<b>SWITCH FOR SHORT TO GROUND</b> <ul style="list-style-type: none"><li>• Turn the ignition switch off.</li><li>• Disconnect DSC HU/CM and DSC OFF switch connector.</li><li>• Inspect for continuity between the DSC HU/CM terminal P and ground.</li><li>• Is there continuity?</li></ul>	Yes	Repair or replace the wiring harness for short to ground between DSC HU/CM terminal P and DSC OFF switch terminal A, then go to the next step.
		No	Go to the next step.
2	<b>INSPECT DSC OFF SWITCH</b> <ul style="list-style-type: none"><li>• Inspect the DSC OFF switch. (See <b>DSC OFF SWITCH INSPECTION</b>.)</li><li>• Is the DSC OFF switch normal?</li></ul>	Yes	Go to the next step.
		No	Replace the DSC OFF switch, then go to the next step. (See <b>DSC OFF SWITCH REMOVAL/INSTALLATION</b> .)
3	<b>VERIFY TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Clear the DTC from the memory. (See <b>ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</b>.)</li><li>• Is the same DTC present?</li></ul>	Yes	Replace the DSC HU/CM, then go to the next step. (See <b>DSC HU/CM REMOVAL/INSTALLATION</b> .)
		No	Go to the next step.
4	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Are any other DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection. (See <b>ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</b> .)
		No	DTC troubleshooting completed.

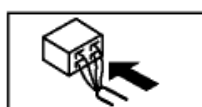
2008 - MX-5 - Brakes

DTC C1095, C1096 [DYNAMIC STABILITY CONTROL (DSC)]

DTC	C1095, C1096	Pump motor, motor relay system
DETECTION CONDITION		<ul style="list-style-type: none"><li>• C1095<ul style="list-style-type: none"><li>▪ When the pump motor monitor voltage remains at <b>2.0 V or more</b> for <b>1 s</b></li></ul></li><li>• C1096<ul style="list-style-type: none"><li>▪ When the difference between the battery power supply voltage and pump motor power supply voltage remains at <b>4.0 V or more</b> for <b>0.1 s or more</b> while the pump motor is operating</li><li>▪ ABS motor monitor OFF signal is input within specified time limit when the motor signal is switched from ON to OFF by ABS HU/CM.</li></ul></li></ul>
POSSIBLE CAUSE		<ul style="list-style-type: none"><li>• ABS 40 A fuse malfunction</li><li>• Open or short to ground circuit in the wiring harness between the battery and the DSC HU/CM terminal B</li><li>• Open circuit in the wiring harness between the DSC HU/CM terminal A and the body ground</li><li>• Open or short circuit in the DSC HU/CM internal motor relay, or stuck motor relay</li><li>• Open or short circuit in the DSC HU/CM internal motor, or frozen motor</li><li>• Fail-safe relay malfunction</li><li>• Poor connection at connectors (female terminal)</li></ul>



DSC HU/CM WIRING HARNESS-SIDE CONNECTOR



## Diagnostic procedure

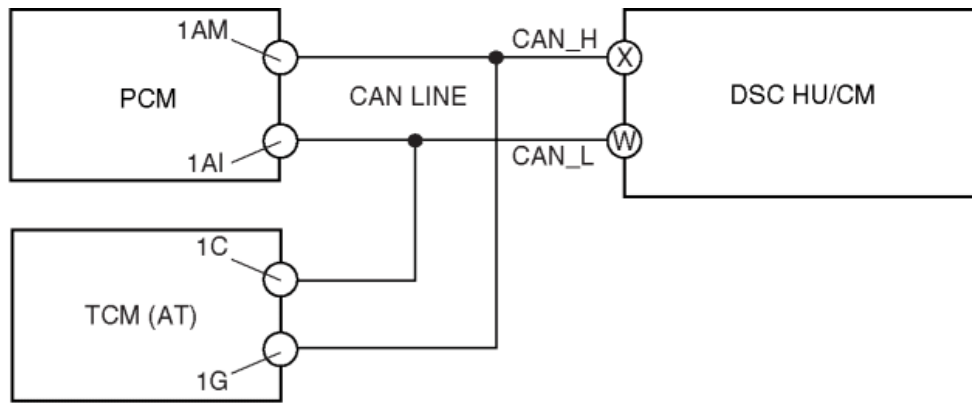
STEP	INSPECTION	ACTION
1	<b>INSPECT ABS FUSE CONDITION</b> <ul style="list-style-type: none"> <li>Is the ABS 40A fuse normal?</li> </ul>	Yes Go to the next step.
		No Replace the fuse, then go to Step 5.
2	<b>INSPECT MOTOR RELAY POWER SUPPLY FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect DSC HU/CM connector.</li> <li>Turn the ignition switch to the ON position (engine off).</li> <li>Measure voltage between DSC HU/CM terminal B (harness-side) and ground.</li> <li>Is the voltage <b>B+</b>?</li> </ul>	Yes Go to the next step.
		No Repair or replace the wiring harness for open circuit between battery positive terminal and DSC HU/CM terminal B, then go to Step 5.
3	<b>INSPECT PUMP MOTOR GROUND FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Inspect for continuity between DSC HU/CM terminal A (harness-side) and ground.</li> <li>Is there continuity?</li> </ul>	Yes Go to the next step.
		No Repair or replace the wiring harness for open circuit between DSC HU/CM terminal A and ground, then go to Step 5.
4	<b>VERIFY PUMP MOTOR OPERATION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Connect the M-MDS to the DLC-2.</li> </ul>	Yes Go to the next step.
		No Replace the DSC HU/CM, then go to the next step. (See <a href="#">DSC HU/CM REMOVAL/INSTALLATION</a> .)

	<p>Turn the ignition switch to the ON position (engine off).</p> <ul style="list-style-type: none"> <li>• Access PMP_MOTOR active command modes using M-MDS.</li> <li>• Does the pump motor operate?</li> </ul>		
5	<b>VERIFY TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Clear the DTC from the memory.</li> </ul> <p>(See <b>ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</b>.)</p> <ul style="list-style-type: none"> <li>• Start the engine and drive the vehicle at <b>10 km/h {6.2 mph} or more</b>.</li> <li>• Gradually slow down and stop the vehicle.</li> <li>• Is the same DTC present?</li> </ul>	Yes	Replace the DSC HU/CM, then go to the next step. (See <b>DSC HU/CM REMOVAL/INSTALLATION</b> .)
		No	Go to the next step.
6	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Are any other DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <b>ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</b> .)
		No	DTC troubleshooting completed.

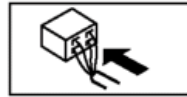
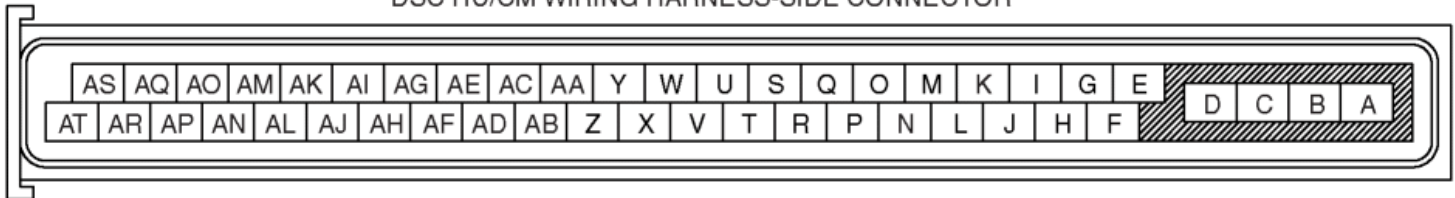
2008 - MX-5 - Brakes

DTC C1134 [DYNAMIC STABILITY CONTROL (DSC)]

DTC	C1134	PCM, TCM communication system
DETECTION CONDITION	<ul style="list-style-type: none"><li>The shift position signal from the PCM or TCM is not within specification.</li></ul>	
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>An abnormal signal is sent from the PCM and/or TCM.</li></ul>	



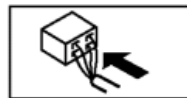
DSC HU/CM WIRING HARNESS-SIDE CONNECTOR



PCM WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

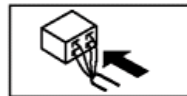
1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



TCM WIRING HARNESS-SIDE CONNECTOR

	1AF	1AA	1Y	1R	1P		1H	1D						
1AG	1AC	1AB	1Z	1V	1S	1Q	1O	1L	1I	1E	1A			
1AH	1AD			1W	1T			1M	1J	1F	1B			
1AI	1AE			1X	1U			1N	1K	1G	1C			

2AF	2AB		2R	2O	2J	2F								
2AG	2AC	2Y	2V	2S	2P	2M	2K	2G	2C					
2AH	2AD	2Z	2W	2T	2Q	2N	2L	2H	2D	2A				
2AI	2AE	2AA	2X	2U							2I	2E	2B	



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT FOR PCM MALFUNCTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Using the M-MDS, perform the DTC inspection for the PCM and TCM.</li> </ul>	Yes Go to applicable DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .) (See <a href="#">DTC TABLE [SJ6A-EL]</a> .)

	Are any DTCs detected?	No	Go to the next step.
2	<b>VERIFY DTC TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Clear the DTC from the memory. (See <b>ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</b>.)</li><li>• Is the same DTC present?</li></ul>	Yes	Repeat the inspection from Step 1.  If the malfunction recurs, replace the DSC HU/CM, then go to the next step.  (See <b>DSC HU/CM REMOVAL/INSTALLATION</b> .)
		No	Go to the next step.
3	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Is any other DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection.  (See <b>ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</b> .)
		No	DTC troubleshooting completed.



## 2008 - MX-5 - Brakes

### DTC C1141, C1142, C1143, C1144 [DYNAMIC STABILITY CONTROL (DSC)]

<b>DTC</b>	<b>C1141</b>	<b>LF ABS sensor rotor system</b>
	<b>C1142</b>	<b>RF ABS sensor rotor system</b>
	<b>C1143</b>	<b>LR ABS sensor rotor system</b>
	<b>C1144</b>	<b>RR ABS sensor rotor system</b>
<b>DETECTION CONDITION</b>		<ul style="list-style-type: none"> <li>Periodic abnormality is detected in the signal wave pattern from the ABS wheel-speed sensors.</li> </ul>
<b>POSSIBLE CAUSE</b>		<ul style="list-style-type: none"> <li>ABS wheel-speed sensor malfunction</li> <li>ABS sensor rotor malfunction (foreign material adhering)</li> <li>Improper installation of ABS wheel-speed sensor and/or sensor rotor</li> <li>Excessive clearance between the ABS wheel-speed sensor and sensor rotor</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT PID FOR ABS WHEEL-SPEED SENSOR OUTPUT ERROR USING M-MDS</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Connect the M-MDS to the DLC-2.</li> <li>Select the following PIDs using the M-MDS: <ul style="list-style-type: none"> <li>LF_WSPD</li> <li>LR_WSPD</li> <li>RF_WSPD</li> <li>RR_WSPD</li> </ul> </li> <li>Drive the vehicle.</li> <li>Verify that the vehicle speeds detected by</li> </ul>	Yes Go to Step 4.
		No Go to the next step.

	<p>the four ABS wheel-speed sensors are approximately the same.</p> <ul style="list-style-type: none"><li>Are the vehicle speeds approximately the same?</li></ul>		
2	<p><b>INSPECT IF MALFUNCTION OCCURRED DUE TO IMPROPER SENSOR CLEARANCE.</b></p> <ul style="list-style-type: none"><li>Inspect the clearance between the ABS wheel-speed sensor and the ABS sensor rotor.  (See <b>FRONT ABS WHEEL-SPEED SENSOR INSPECTION.</b>)  (See <b>REAR ABS WHEEL-SPEED SENSOR INSPECTION.</b>)</li><li>Is the clearance normal?<ul style="list-style-type: none"><li><b>Clearance</b>  Front: 0.3—1.0 mm {0.012—0.057 in}  Rear: 0.8—1.6 mm {0.032—0.062 in}</li></ul></li></ul>	Yes	Go to the next step.
		No	Replace the ABS wheel-speed sensor, then go to Step 4.  (See <b>FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.</b> )  (See <b>REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.</b> )
3	<p><b>VISUALLY INSPECT ABS SENSOR ROTOR FOR FOREIGN MATERIAL ADHERING OR IMPROPER INSTALLATION</b></p> <ul style="list-style-type: none"><li>Is the result normal?</li></ul>	Yes	Go to the next step.
		No	Replace the front wheel hub component or rear drive shaft, then go to the next step.  (See <b>WHEEL HUB, STEERING KNUCKLE REMOVAL/INSTALLATION.</b> )  (See <b>REAR DRIVE SHAFT REMOVAL/INSTALLATION.</b> )
4	<p><b>VERIFY THAT THE SAME DTC IS NOT PRESENT</b></p> <ul style="list-style-type: none"><li>Clear the DTC from the memory.  (See <b>ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].</b>)</li><li>Start the engine and drive the vehicle at <b>10 km/h {6.2 mph} or more.</b></li><li>Are the same DTCs present?</li></ul>	Yes	Repeat the inspection from Step 1.  If the malfunction recurs, replace the DSC HU/CM, then go to the next step.  (See <b>DSC HU/CM REMOVAL/INSTALLATION.</b> )
		No	Go to the next step.
5	<p><b>VERIFY THAT NO OTHER DTCS ARE PRESENT</b></p> <ul style="list-style-type: none"><li>Are any other DTCs output?</li></ul>	Yes	Go to the applicable DTC inspection.  (See <b>ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].</b> )

	No DTC troubleshooting completed.
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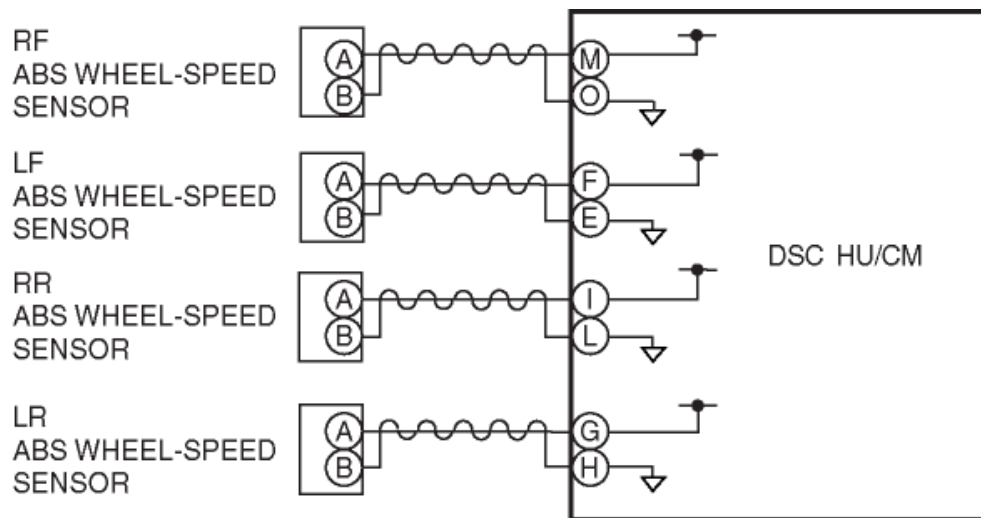
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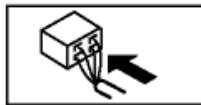
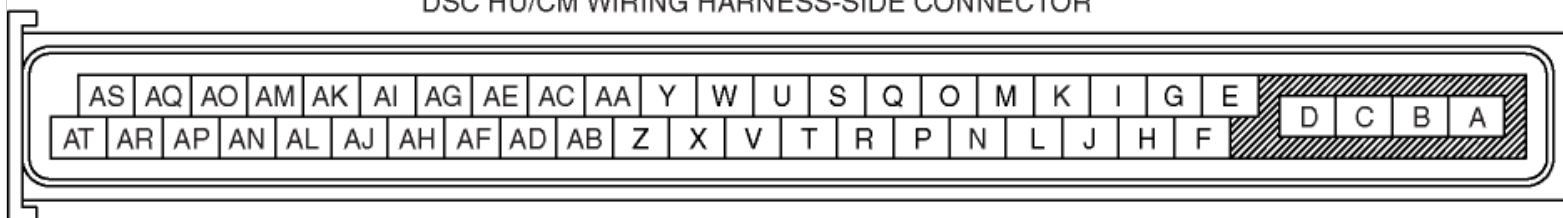
2008 - MX-5 - Brakes

DTC C1145, C1155, C1165, C1175 [DYNAMIC STABILITY CONTROL (DSC)]

DTC	C1145	RF ABS wheel-speed sensor (open circuit) system
	C1155	LF ABS wheel-speed sensor (open circuit) system
	C1165	RR ABS wheel-speed sensor (open circuit) system
	C1175	LR ABS wheel-speed sensor (open circuit) system
DETECTION CONDITION		<ul style="list-style-type: none"><li>Open circuit has been detected in the ABS wheel-speed sensor or the ABS wheel-speed sensor wiring harness on any of the four vehicle wheels.</li></ul>
POSSIBLE CAUSE		<ul style="list-style-type: none"><li>Open circuit in the wiring harness between the following DSC HU/CM terminal and the ABS wheel-speed sensor terminal:<ul style="list-style-type: none"><li>DSC HU/CM terminal M—RF ABS wheel-speed sensor terminal A</li><li>DSC HU/CM terminal O—RF ABS wheel-speed sensor terminal B</li><li>DSC HU/CM terminal F—LF ABS wheel-speed sensor terminal A</li><li>DSC HU/CM terminal E—LF ABS wheel-speed sensor terminal B</li><li>DSC HU/CM terminal I—RR ABS wheel-speed sensor terminal A</li><li>DSC HU/CM terminal L—RR ABS wheel-speed sensor terminal B</li><li>DSC HU/CM terminal G—LR ABS wheel-speed sensor terminal A</li><li>DSC HU/CM terminal H—LR ABS wheel-speed sensor terminal B</li></ul></li><li>ABS wheel-speed sensor malfunction</li><li>Poor connection at connectors (female terminal)</li></ul>



DSC HU/CM WIRING HARNESS-SIDE CONNECTOR



ABS WHEEL-SPEED SENSOR WIRING HARNESS-SIDE CONNECTOR

FRONT

REAR



## Diagnostic procedure

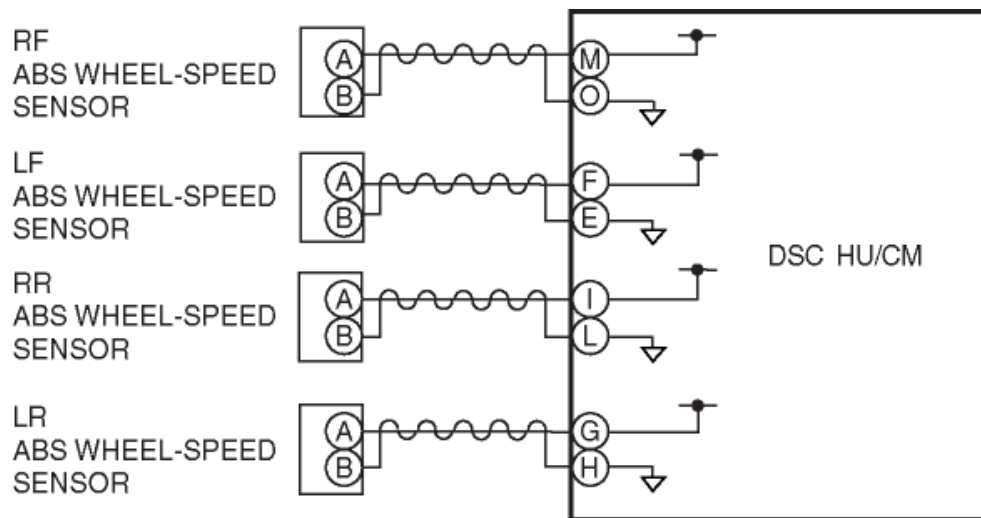
STEP	INSPECTION	ACTION
1	<p><b>INSPECT PID TO VERIFY THAT WHEEL SPEED-SIGNALS ARE TRANSMITTED FROM ABS WHEEL- SPEED SENSOR USING M-MDS</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Connect the M-MDS to the DLC-2.</li> <li>Select the following PIDs using the M-MDS: <ul style="list-style-type: none"> <li>LF_WSPD</li> <li>LR_WSPD</li> <li>RF_WSPD</li> <li>RR_WSPD</li> </ul> </li> <li>Drive the vehicle.</li> </ul>	<p>Yes Go to Step 3.</p> <p>No Go to the next step.</p>

	<ul style="list-style-type: none"> <li>• Verify that the wheel speed-signals are transmitted from each ABS wheel-speed sensor.</li> <li>• Are the wheel-speed signals transmitted?</li> </ul>		
2	<b>INSPECT FOR OPEN CIRCUIT IN WIRING HARNESS BETWEEN DSC HU/CM AND ABS WHEEL-SPEED SENSOR</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the DSC HU/CM connector and ABS wheel-speed sensor.</li> <li>• Inspect for continuity in the wiring harness between the following ABS wheel-speed sensor connectors on the vehicle wiring harness-side and DSC HU/CM connectors. <ul style="list-style-type: none"> <li>▪ RF ABS wheel-speed sensor (+): M—A</li> <li>▪ RF ABS wheel-speed sensor (-): O—B</li> <li>▪ LF ABS wheel-speed sensor (+): F—A</li> <li>▪ LF ABS wheel-speed sensor (-): E—B</li> <li>▪ RR ABS wheel-speed sensor (+): I—A</li> <li>▪ RR ABS wheel-speed sensor (-): L—B</li> <li>▪ LR ABS wheel-speed sensor (+): G—A</li> <li>▪ LR ABS wheel-speed sensor (-): H—B</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes Replace the ABS wheel-speed sensor, then go to the next step.  (See <a href="#">FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.</a> )  (See <a href="#">REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.</a> )	No Repair or replace the wiring harness, then go to the next step.
3	<b>VERIFY THAT THE SAME DTC IS NOT PRESENT</b> <ul style="list-style-type: none"> <li>• Clear the DTCs from the memory. (See <a href="#">ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].</a>)</li> <li>• Start the engine and drive the vehicle at <b>10 km/h {6.2 mph} or more.</b></li> <li>• Are the same DTCs present?</li> </ul>	Yes Repeat the inspection from Step 1.  If the malfunction recurs, replace the DSC HU/CM, then go to the next step.  (See <a href="#">DSC HU/CM REMOVAL/INSTALLATION.</a> )	No Go to the next step.
4	<b>VERIFY THAT NO OTHER DTCS ARE PRESENT</b> <ul style="list-style-type: none"> <li>• Are any other DTCs output?</li> </ul>	Yes Go to the applicable DTC inspection.  (See <a href="#">ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].</a> )	No DTC troubleshooting completed.

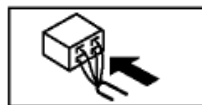
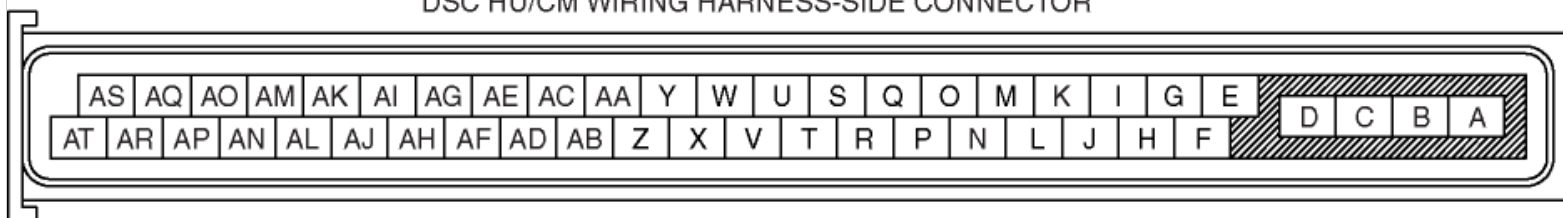
2008 - MX-5 - Brakes

DTC C1148, C1158, C1168, C1178 [DYNAMIC STABILITY CONTROL (DSC)]

DTC	C1148	RF ABS wheel-speed sensor/ABS sensor rotor system
	C1158	LF ABS wheel-speed sensor/ABS sensor rotor system
	C1168	RR ABS wheel-speed sensor/ABS sensor rotor system
	C1178	LR ABS wheel-speed sensor/ABS sensor rotor system
DETECTION CONDITION		<ul style="list-style-type: none"><li>Vehicle wheel speed signals of any of the four vehicle wheels indicate abnormal acceleration that exceeds specification.</li><li>Vehicle wheel speed signals of any of the four vehicle wheels indicate speed that exceeds specification.</li></ul>
POSSIBLE CAUSE		<ul style="list-style-type: none"><li>ABS wheel-speed sensor malfunction (low output, metal shavings on sensor)</li><li>ABS sensor rotor malfunction (chipping of sensor rotor teeth)</li><li>Poor installation of ABS wheel-speed sensor and/or sensor rotor</li><li>Excessive clearance between the ABS wheel-speed sensor and sensor rotor</li></ul>



DSC HU/CM WIRING HARNESS-SIDE CONNECTOR



ABS WHEEL-SPEED SENSOR WIRING HARNESS-SIDE CONNECTOR

FRONT

REAR



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT PID FOR ABNORMAL OUTPUT FROM ABS WHEEL-SPEED SENSOR USING M-MDS</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Connect the M-MDS to the DLC-2.</li> <li>Select the following PIDs using the M-MDS: <ul style="list-style-type: none"> <li>LF_WSPD</li> <li>LR_WSPD</li> <li>RF_WSPD</li> <li>RR_WSPD</li> </ul> </li> <li>Start the engine and drive the vehicle.</li> </ul>	<p>Yes Go to Step 4.</p> <p>No If there is a difference in speeds of the four wheels, go to the next step.</p>



	<ul style="list-style-type: none"> <li>• Verify that the PIDs of the four ABS wheel-speed sensors correspond approximately.</li> <li>• Do the vehicle speeds correspond?</li> </ul>		
2	<b>INSPECT IF MALFUNCTION OCCURRED DUE TO IMPROPER SENSOR CLEARANCE</b> <ul style="list-style-type: none"> <li>• Inspect the clearance between the ABS wheel-speed sensor and the ABS sensor rotor. <ul style="list-style-type: none"> <li>◦ <b>Clearance</b> <p><b>Front: 0.3—1.0 mm {0.012—0.057 in}</b></p> <p><b>Rear: 0.8—1.6 mm {0.032—0.062 in}</b></p> </li> </ul> </li> </ul>	Yes	Go to the next step.
		No	Replace the rear ABS wheel-speed sensor, then go to Step 4.  (See <a href="#">FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.</a> )  (See <a href="#">REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.</a> )
3	<b>VISUALLY INSPECT ABS SENSOR ROTOR FOR FOREIGN MATERIAL ADHERING OR IMPROPER INSTALLATION</b> <ul style="list-style-type: none"> <li>• Is the result normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the front wheel hub component or rear drive shaft, then go to the next step.  (See <a href="#">WHEEL HUB, STEERING KNUCKLE REMOVAL/INSTALLATION.</a> )  (See <a href="#">REAR DRIVE SHAFT REMOVAL/INSTALLATION.</a> )
4	<b>VERIFY DTC TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Clear the DTC from the memory.  (See <a href="#">ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].</a>)</li> <li>• Start the engine and drive the vehicle at <b>10 km/h {6.2 mph} or more.</b></li> <li>• Are the same DTCs present?</li> </ul>	Yes	Repeat the inspection from Step 1.  If the malfunction recurs, replace the DSC HU/CM, then go to the next step.  (See <a href="#">DSC HU/CM REMOVAL/INSTALLATION.</a> )
		No	Go to the next step.
5	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Are any other DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection.  (See <a href="#">ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].</a> )
		No	DTC troubleshooting completed.

2008 - MX-5 - Brakes

DTC C1186, C1266 [DYNAMIC STABILITY CONTROL (DSC)]

DTC	C1186, C1266	Valve relay system
DETECTION CONDITION	<ul style="list-style-type: none"><li>C1186<ul style="list-style-type: none"><li>DSC HU/CM internal valve relay remains OFF when valve relay ON is commanded.</li></ul></li><li>C1266<ul style="list-style-type: none"><li>DSC HU/CM internal valve relay remains ON (stuck) when valve relay OFF is commanded.</li></ul></li></ul>	
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>ABS 30 A fuse malfunction</li><li>Open circuit or short to ground in the wiring harness between the battery and the DSC HU/CM terminal C</li><li>Open or short circuit in the DSC HU/CM internal valve relay, or stuck valve relay</li><li>Poor connection at connectors (female terminal)</li></ul>	

DSC HU/CM

DSC HU/CM WIRING HARNESS-SIDE CONNECTOR

Diagnostic procedure

STEP	INSPECTION	ACTION
1	<div><div>INSPECT DSC FUSE CONDITION</div><div><ul style="list-style-type: none"><li>Is the ABS 30 A fuse normal?</li></ul></div></div>	<div>YesGo to the next step.</div>

		No	Replace the fuse, then go to Step 3.
2	<b>INSPECT VALVE RELAY POWER SUPPLY FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect DSC HU/CM connector.</li> <li>• Turn the ignition switch to the ON position (engine off).</li> <li>• Measure voltage between DSC HU/CM terminal C (harness-side) and ground.</li> <li>• Is voltage <b>B+</b>?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit between battery positive terminal and DSC HU/CM terminal C, then go to the next step.
3	<b>VERIFY TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"> <li>• Clear the DTC from the memory.</li> </ul> <p>(See <b>ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</b>.)</p> <ul style="list-style-type: none"> <li>• Is the same DTC present?</li> </ul>	Yes	Replace the DSC HU/CM, then go to next step. (See <b>DSC HU/CM REMOVAL/INSTALLATION</b> .)
		No	Go to the next step.
4	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Are any other DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <b>ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</b> .)
		No	DTC troubleshooting completed.

## 2008 - MX-5 - Brakes

**DTC C1194, C1198, C1210, C1214, C1242, C1246, C1250, C1254, C1400, C1410, C1957, C1958 [DYNAMIC STABILITY CONTROL (DSC)]**

DTC	C 1194	LF outlet solenoid valve system
	C 1198	LF inlet solenoid valve system
	C 1210	RF outlet solenoid valve system
	C 1214	RF inlet solenoid valve system
	C 1242	LR outlet solenoid valve system
	C 1246	RR outlet solenoid valve system
	C 1250	LR inlet solenoid valve system
	C 1254	RR inlet solenoid valve system
	C 1400	RF traction control solenoid valve system
	C 1410	LF traction control solenoid valve system
	C 1957	RF stability control solenoid valve system
	C 1958	LF stability control solenoid valve system
DETECTION CONDITION		<ul style="list-style-type: none"> <li>Solenoid valve operation does not correspond to solenoid ON/OFF commands from the DSC HU/CM.</li> </ul>
POSSIBLE CAUSE		<ul style="list-style-type: none"> <li>Open or short circuit in the DSC HU/CM internal solenoid valves</li> <li>Solenoid valve malfunction</li> <li>Poor connection at connectors (female terminal)</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY SOLENOID VALVE OPERATION</b>	
	<ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> </ul>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Connect the M-MDS to the DLC-2.</li> <li>Turn the ignition switch to the ON</li> </ul>	No Replace the DSC HU/CM, then go to the next step.

	<p>position (engine off).</p> <ul style="list-style-type: none"> <li>• Access the active command mode for the solenoid valve using the M-MDS.</li> <li>• Does the solenoid valve operate?</li> </ul>		(See <a href="#">DSC HU/CM REMOVAL/INSTALLATION.</a> )
2	<p><b>VERIFY DTC TROUBLESHOOTING COMPLETED</b></p> <ul style="list-style-type: none"> <li>• Clear the DTC from the memory.</li> </ul> <p>(See <a href="#">ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</a>.)</p> <ul style="list-style-type: none"> <li>• Start the engine and drive the vehicle at <b>10 km/h {6.2 mph} or more.</b></li> <li>• Gradually slow down and stop vehicle.</li> <li>• Are the same DTCs present?</li> </ul>	Yes	<p>Repeat the inspection from Step 1.</p> <p>If the malfunction recurs, replace the DSC HU/CM, then go to the next step.</p> <p>(See <a href="#">DSC HU/CM REMOVAL/INSTALLATION.</a>)</p>
		No	Go to the next step.
3	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"> <li>• Are any other DTCs present?</li> </ul>	Yes	<p>Go to the applicable DTC inspection.</p> <p>(See <a href="#">ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</a>.)</p>
		No	DTC troubleshooting completed.

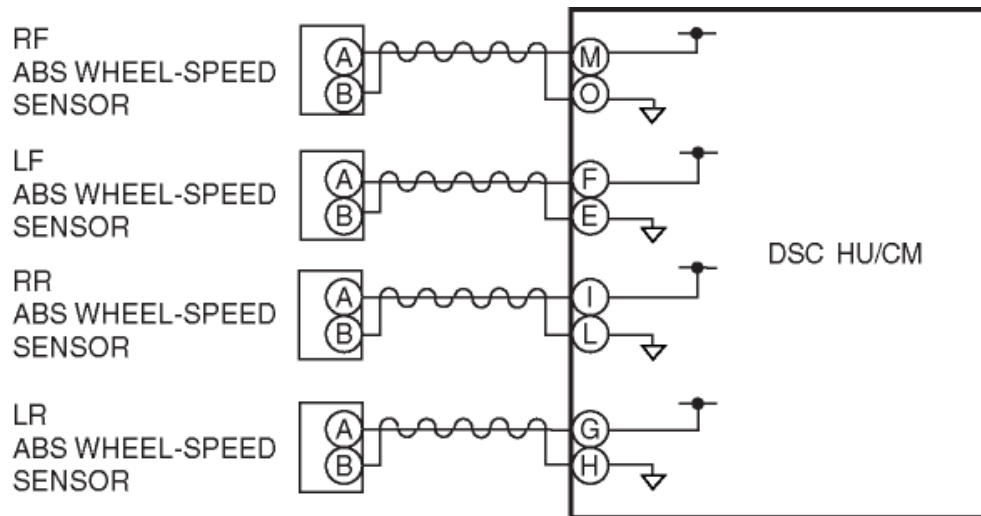
2008 - MX-5 - Brakes

DTC C1222 [DYNAMIC STABILITY CONTROL (DSC)]

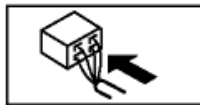
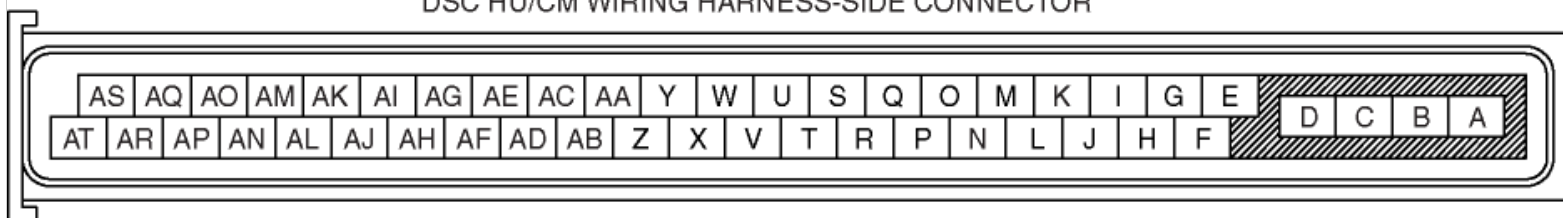
NOTE:

- DTC C1222 will be detected when a malfunctioning ABS wheel-speed sensor cannot be specified.

DTC	C1222	ABS wheel-speed sensor (slip monitor) system
DETECTION CONDITION		<ul style="list-style-type: none"><li>• Difference between any vehicle wheel speeds exceeds specification when driving at a constant speed.</li><li>• ABS control operates for <b>60 s or more</b>.</li></ul>
POSSIBLE CAUSE		<ul style="list-style-type: none"><li>• ABS wheel-speed sensor malfunction (low output, metal shavings on sensor)</li><li>• ABS sensor rotor malfunction (chipping of sensor rotor teeth)</li><li>• Poor installation of ABS wheel-speed sensor and/or sensor rotor (If the sensor rotor is installed at an angle, it may cause output of abnormal wave pattern at high speeds.)</li><li>• Excessive clearance between the ABS wheel-speed sensor and sensor rotor</li></ul>



DSC HU/CM WIRING HARNESS-SIDE CONNECTOR



ABS WHEEL-SPEED SENSOR WIRING HARNESS-SIDE CONNECTOR

FRONT

REAR



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT PID FOR ABNORMAL OUTPUT FROM ABS WHEEL-SPEED SENSOR USING M-MDS</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Connect the M-MDS to the DLC-2.</li> <li>Select the following PIDs using the M-MDS: <ul style="list-style-type: none"> <li>LF_WSPD</li> <li>LR_WSPD</li> <li>RF_WSPD</li> <li>RR_WSPD</li> </ul> </li> <li>Drive the vehicle.</li> </ul>	<p>Yes Go to Step 4.</p> <p>No If there is a difference in speeds of the four wheels, go to the next step.</p>

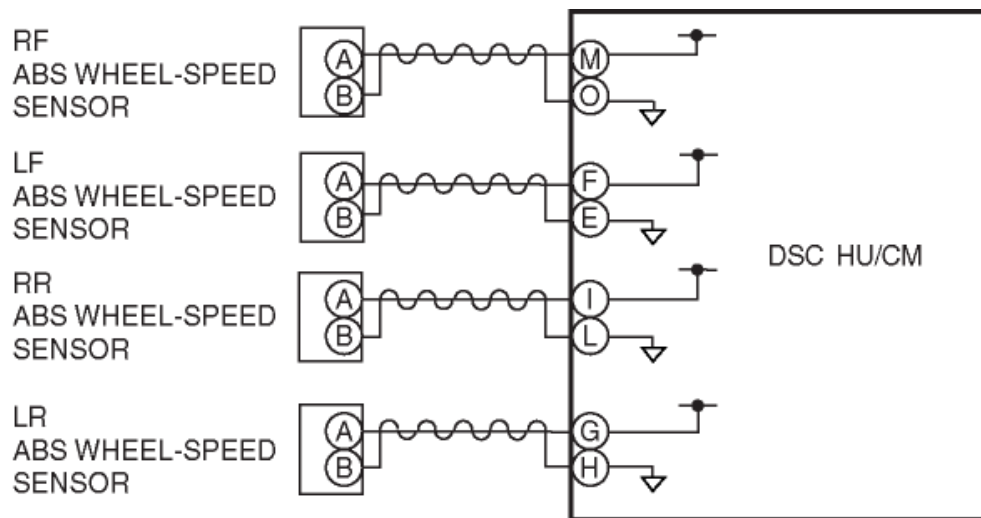
	<ul style="list-style-type: none"> <li>• Verify that the PIDs of the four ABS wheel-speed sensors correspond approximately.</li> <li>• Do the vehicle speeds correspond?</li> </ul>		
2	<b>INSPECT IF MALFUNCTION OCCURRED DUE TO IMPROPER SENSOR CLEARANCE</b> <ul style="list-style-type: none"> <li>• Inspect the clearance between the ABS wheel-speed sensor and the ABS sensor rotor. <ul style="list-style-type: none"> <li>◦ <b>Clearance</b> <p><b>Front: 0.3—1.0 mm {0.012—0.057 in}</b></p> <p><b>Rear: 0.8—1.6 mm {0.032—0.062 in}</b></p> </li> </ul> </li> </ul>	Yes	Go to the next step.
		No	Replace the rear ABS wheel-speed sensor, then go to Step 4.  (See <a href="#">FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.</a> )  (See <a href="#">REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.</a> )
3	<b>VISUALLY INSPECT ABS SENSOR ROTOR FOR FOREIGN MATERIAL ADHERING OR IMPROPER INSTALLATION</b> <ul style="list-style-type: none"> <li>• Is the result normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the front wheel hub component or rear drive shaft, then go to the next step.  (See <a href="#">WHEEL HUB, STEERING KNUCKLE REMOVAL/INSTALLATION.</a> )  (See <a href="#">REAR DRIVE SHAFT REMOVAL/INSTALLATION.</a> )
4	<b>VERIFY DTC TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Clear the DTC from the memory.  (See <a href="#">ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].</a>)</li> <li>• Are the same DTCs present?</li> </ul>	Yes	Repeat the inspection from Step 1.  If the malfunction recurs, replace the DSC HU/CM, then go to the next step.  (See <a href="#">DSC HU/CM REMOVAL/INSTALLATION.</a> )
		No	Go to the next step.
5	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Are any other DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection.  (See <a href="#">ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].</a> )
		No	DTC troubleshooting completed.



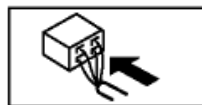
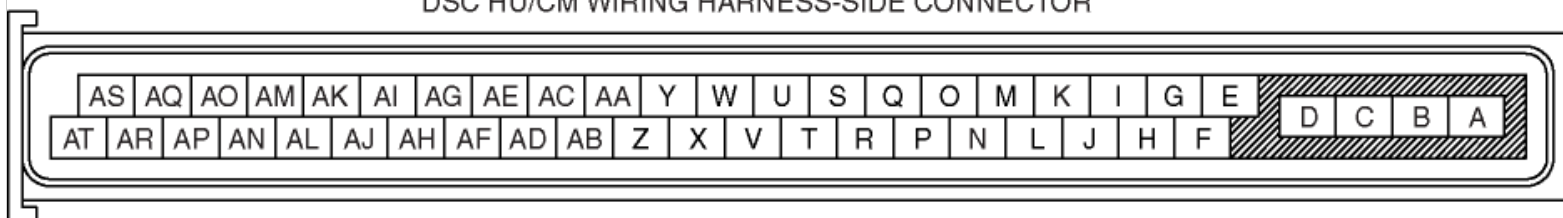
2008 - MX-5 - Brakes

DTC C1233, C1234, C1235, C1236 [DYNAMIC STABILITY CONTROL (DSC)]

DTC	C1233	LF ABS wheel-speed sensor (short to ground) system
	C1234	RF ABS wheel-speed sensor (short to ground) system
	C1235	RR ABS wheel-speed sensor (short to ground) system
	C1236	LR ABS wheel-speed sensor (short to ground) system
DETECTION CONDITION		<ul style="list-style-type: none"><li>The vehicle wheel speed of any of the four vehicle wheels is <b>2.75 km/h {1.71 mph} or less</b> when driving at the specified vehicle speed or more.</li></ul>
POSSIBLE CAUSE		<ul style="list-style-type: none"><li>Short to ground in the wiring harness between the following DSC HU/CM terminal and the ABS wheel-speed sensor terminal:<ul style="list-style-type: none"><li>DSC HU/CM terminal M—RF ABS wheel-speed sensor terminal A</li><li>DSC HU/CM terminal O—RF ABS wheel-speed sensor terminal B</li><li>DSC HU/CM terminal F—LF ABS wheel-speed sensor terminal A</li><li>DSC HU/CM terminal E—LF ABS wheel-speed sensor terminal B</li><li>DSC HU/CM terminal I—RR ABS wheel-speed sensor terminal A</li><li>DSC HU/CM terminal L—RR ABS wheel-speed sensor terminal B</li><li>DSC HU/CM terminal G—LR ABS wheel-speed sensor terminal A</li><li>DSC HU/CM terminal H—LR ABS wheel-speed sensor terminal B</li></ul></li><li>ABS wheel-speed sensor malfunction</li><li>Poor connection at connectors (female terminal)</li></ul>



DSC HU/CM WIRING HARNESS-SIDE CONNECTOR



ABS WHEEL-SPEED SENSOR WIRING HARNESS-SIDE CONNECTOR

FRONT

REAR



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT PID TO VERIFY THAT WHEEL SPEED-SIGNALS ARE TRANSMITTED FROM ABS WHEEL- SPEED SENSOR USING M-MDS</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Connect the M-MDS to the DLC-2.</li> <li>Select the following PIDs using the M-MDS: <ul style="list-style-type: none"> <li>LF_WSPD</li> <li>LR_WSPD</li> <li>RF_WSPD</li> <li>RR_WSPD</li> </ul> </li> <li>Drive the vehicle.</li> </ul>	<p>Yes Go to Step 3.</p> <p>No Go to the next step.</p>

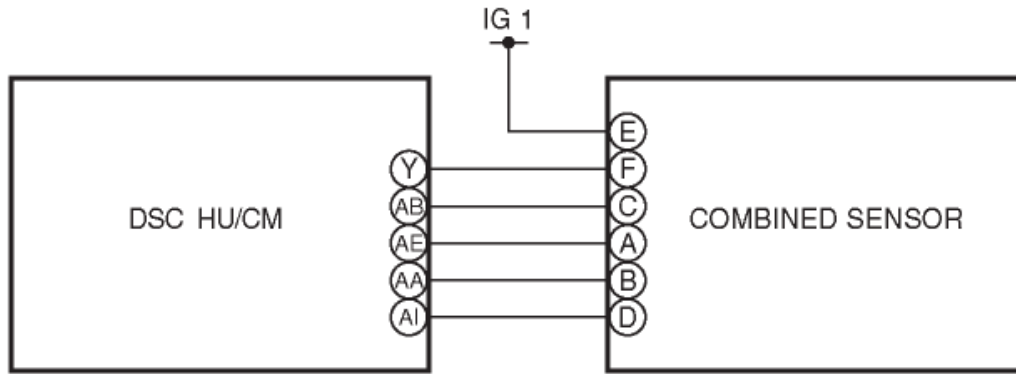
	<ul style="list-style-type: none"> <li>• Verify that the wheel speed-signals are transmitted from each ABS wheel-speed sensor.</li> <li>• Are the wheel-speed signals transmitted?</li> </ul>		
2	<b>INSPECT A SHORT TO GROUND IN THE WIRING HARNESS BETWEEN THE DSC HU/CM AND THE ABS WHEEL-SPEED SENSOR</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the DSC HU/CM connector and the ABS wheel-speed sensor connector.</li> <li>• Inspect for a short to ground in the wiring harness between the following ABS wheel-speed sensor connectors on the vehicle wiring harness-side and DSC HU/CM connectors. <ul style="list-style-type: none"> <li>▪ RF ABS wheel-speed sensor (+): M—A</li> <li>▪ RF ABS wheel-speed sensor (–): O—B</li> <li>▪ LF ABS wheel-speed sensor (+): F—A</li> <li>▪ LF ABS wheel-speed sensor (–): E—B</li> <li>▪ RR ABS wheel-speed sensor (+): I—A</li> <li>▪ RR ABS wheel-speed sensor (–): L—B</li> <li>▪ LR ABS wheel-speed sensor (+): G—A</li> <li>▪ LR ABS wheel-speed sensor (–): H—B</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes Replace the ABS wheel-speed sensor, then go to the next step.  (See <a href="#">FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.</a> )  (See <a href="#">REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.</a> )	No Repair or replace the wiring harness, then go to the next step.
3	<b>VERIFY THAT THE SAME DTC IS NOT PRESENT</b> <ul style="list-style-type: none"> <li>• Clear the DTCs from the memory. (See <a href="#">ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].</a>)</li> <li>• Start the engine and drive the vehicle at <b>10 km/h {6.2 mph} or more.</b></li> <li>• Are the same DTCs present?</li> </ul>	Yes Repeat the inspection from Step 1.  If the malfunction recurs, replace the DSC HU/CM, then go to the next step.  (See <a href="#">DSC HU/CM REMOVAL/INSTALLATION.</a> )	No Go to the next step.
4	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Are any other DTCs present?</li> </ul>	Yes Go to the applicable DTC inspection.  (See <a href="#">ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].</a> )	No DTC troubleshooting completed.

2008 - MX-5 - Brakes

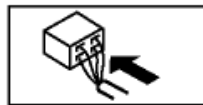
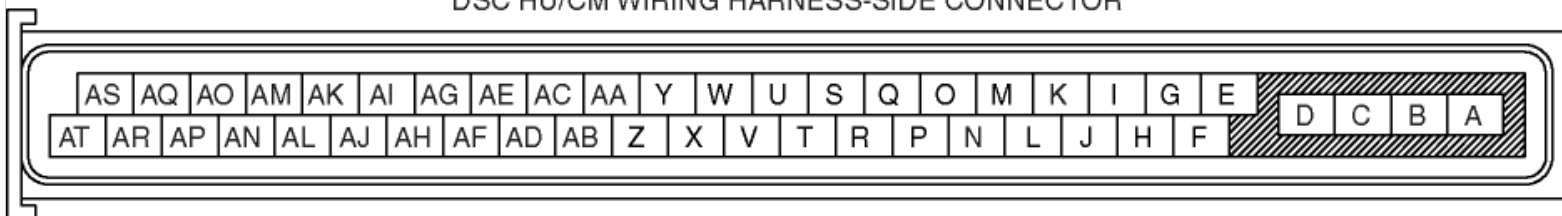
DTC C1279, C1280, C1281, C1282, C1951, C1952, C1959, C2768 [DYNAMIC STABILITY CONTROL (DSC)]

DTC	C1279, C1280, C1281, C1282, C1951, C1952, C1959, C2768	Combined sensor system
DETECTION CONDITION	<ul style="list-style-type: none"><li>• C1279<ul style="list-style-type: none"><li>▪ The yaw rate value from the combined sensor (yaw rate part) exceeds specification while the vehicle is stopped or while accelerating from a standstill.</li></ul></li><li>• C1280<ul style="list-style-type: none"><li>▪ The difference between the yaw rate value calculated by each sensor and the yaw rate value from the combined sensor (yaw rate part) exceeds specification.</li></ul></li><li>• C1281<ul style="list-style-type: none"><li>▪ The difference between the lateral-G value calculated by each sensor and the lateral-G value from the combined sensor (lateral-G part) exceeds specification.</li></ul></li><li>• C1282<ul style="list-style-type: none"><li>▪ Specified signal pattern from combined sensor has not output after the ignition switch is turned to the ON position.</li></ul></li><li>• C1951<ul style="list-style-type: none"><li>▪ The monitor voltage from the combined sensor (lateral-G part) is not within specification.</li></ul></li><li>• C1952<ul style="list-style-type: none"><li>▪ The monitor voltage from the combined sensor (yaw rate part) is not within specification.</li></ul></li><li>• C1959<ul style="list-style-type: none"><li>▪ The lateral-G value from the combined sensor (lateral-G part) exceeds specification.</li></ul></li><li>• C2768<ul style="list-style-type: none"><li>▪ There is an abnormality in the signal from the combined sensor (yaw rate part).</li></ul></li></ul>	
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Open circuit in the wiring harness between ignition switch and combined sensor terminal E or short circuit to ground</li><li>• Open circuit in the wiring harness between DSC HU/CM terminal Y and combined sensor terminal F or short circuit to ground</li><li>• Open circuit in the wiring harness between DSC HU/CM terminal AB and combined sensor terminal C or short circuit to ground</li><li>• Open circuit in the wiring harness between DSC HU/CM terminal AE and combined sensor terminal A or short circuit to ground</li><li>• Open circuit in the wiring harness between DSC HU/CM terminal AA and combined sensor terminal B or short circuit to ground</li><li>• Open circuit in the wiring harness between DSC HU/CM terminal AI and combined sensor terminal D</li></ul>	

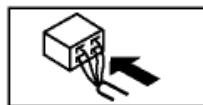
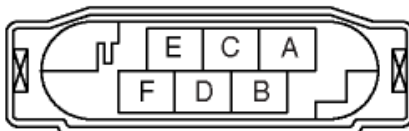
- Combined sensor malfunction
- Poor connection at connectors (female terminal)



DSC HU/CM WIRING HARNESS-SIDE CONNECTOR



COMBINED SENSOR WIRING HARNESS-SIDE CONNECTOR



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT COMBINED SENSOR POWER SUPPLY FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position (engine off).</li> <li>• Measure voltage between combined sensor terminal E (harness-side) and ground.</li> <li>• Is the voltage <b>B+</b>?</li> </ul>	Yes Go to the next step.  No Repair or replace the wiring harness for open circuit between combined sensor terminal E and ignition switch, then go to Step 12.
2	<b>INSPECT COMBINED SENSOR GROUND FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect DSC HU/CM and combined sensor connectors.</li> </ul>	Yes Go to the next step.  No Repair or replace the wiring harness for open circuit between DSC HU/CM terminal Y and combined sensor terminal F, then go to Step 12.

	<ul style="list-style-type: none"> <li>Inspect for continuity between DSC HU/CM terminal Y (harness-side) and combined sensor terminal F (harness-side).</li> <li>Is there continuity?</li> </ul>		
3	<b>INSPECT COMBINED SENSOR (YAW RATE PART) SIGNAL FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for continuity between DSC HU/CM terminal AA (harness-side) and combined sensor terminal B (harness-side).</li> <li>Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit between DSC HU/CM terminal AA and combined sensor terminal B, then go to Step 12.
4	<b>INSPECT COMBINED SENSOR (YAW RATE PART) SIGNAL FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Inspect for continuity between DSC HU/CM terminal AA (harness-side) and ground.</li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness for short to ground between DSC HU/CM terminal AA and combined sensor terminal B, then go to Step 12.
		No	Go to the next step.
5	<b>INSPECT COMBINED SENSOR (LATERAL-G PART) SIGNAL FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for continuity between DSC HU/CM terminal AI (harness-side) and combined sensor terminal D (harness-side).</li> <li>Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit between DSC HU/CM terminal AI and combined sensor terminal D, then go to Step 12.
6	<b>INSPECT COMBINED SENSOR (LATERAL-G PART) SIGNAL FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Inspect for continuity between DSC HU/CM terminal AI (harness-side) and ground.</li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness for short to ground between DSC HU/CM terminal AI and combined sensor terminal D, then go to Step 12.
		No	Go to the next step.
7	<b>INSPECT REFERENCE SIGNAL FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Inspect for continuity between DSC HU/CM terminal AE (harness-side) and combined sensor terminal A (harness-side).</li> <li>Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit between DSC HU/CM terminal AE and combined sensor terminal A, then go to Step 12.
8	<b>INSPECT REFERENCE SIGNAL FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Inspect for continuity between DSC HU/CM terminal AE (harness-side) and ground.</li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness for short to ground between DSC HU/CM terminal AE and combined sensor terminal A, then go to Step 12.
		No	Go to the next step.
9	<b>INSPECT TEST SIGNAL FOR OPEN CIRCUIT</b>	Yes	Go to the next step.

	<ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Inspect for continuity between DSC HU/CM terminal AB (harness-side) and combined sensor terminal C (harness-side).</li> <li>• Is there continuity?</li> </ul>	No	Repair or replace the wiring harness for open circuit between DSC HU/CM terminal AB and combined sensor terminal C, then go to Step 12.
10	<b>INSPECT TEST SIGNAL FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Inspect for continuity between DSC HU/CM terminal AB (harness-side) and ground.</li> <li>• Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness for short to ground between DSC HU/CM terminal AB and combined sensor terminal C, then go to Step 12.
		No	Go to the next step.
11	<b>INSPECT COMBINED SENSOR</b> <ul style="list-style-type: none"> <li>• Inspect the combined sensor. (See <a href="#">COMBINED SENSOR INSPECTION.</a>)</li> <li>• Is the combined sensor normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the combined sensor, then go to the next step. (See <a href="#">COMBINED SENSOR REMOVAL/INSTALLATION.</a> )
12	<b>VERIFY DTC TROUBLESHOOTING COMPLETED.</b> <ul style="list-style-type: none"> <li>• Clear the DTC from the memory. (See <a href="#">ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].</a>)</li> <li>• Are the same DTCs present?</li> </ul>	Yes	Replace the DSC HU/CM, then go to the next step. (See <a href="#">DSC HU/CM REMOVAL/INSTALLATION.</a> )
		No	Go to the next step.
13	<b>VERIFY AFTER REPAIR PROCEDURE.</b> <ul style="list-style-type: none"> <li>• Are any other DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].</a> )
		No	DTC troubleshooting completed.

## 2008 - MX-5 - Brakes

### DTC C1288, C1290, C1953 [DYNAMIC STABILITY CONTROL (DSC)]

DTC	C1288, C1290, C1953	Brake fluid pressure sensor system
DETECTION CONDITION	<ul style="list-style-type: none"> <li>• C1288 <ul style="list-style-type: none"> <li>▪ The pressure from the brake fluid pressure sensor when the system starts up is not within specification.</li> </ul> </li> <li>• C1290 <ul style="list-style-type: none"> <li>▪ The standard brake fluid pressure calculated in the DSC HU/CM when not braking exceeds the specification.</li> </ul> </li> <li>• C1953 <ul style="list-style-type: none"> <li>▪ The output voltage from the brake fluid pressure sensor is not within specification.</li> </ul> </li> </ul>	
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>• Open or short circuit in the brake fluid pressure sensor circuit in the DSC HU/CM</li> <li>• Malfunction in the brake fluid pressure sensor</li> </ul>	

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY NO ABNORMALITY ON BRAKE FLUID PRESSURE SENSOR</b> <ul style="list-style-type: none"> <li>• Clear the DTCs from the memory. (See <a href="#">ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</a>.)</li> <li>• Start the engine and drive the vehicle at <b>10 km/h {6.2 mph} or more.</b></li> <li>• Are the same DTCs present?</li> </ul>	Yes Replace the DSC HU/CM, then go to the next step.  (See <a href="#">DSC HU/CM REMOVAL/INSTALLATION</a> .)
		No Go to the next step.
2	<b>VERIFY THAT NO OTHER DTCS ARE PRESENT</b> <ul style="list-style-type: none"> <li>• Are any other DTCs output?</li> </ul>	Yes Go to the applicable DTC inspection.  (See <a href="#">ON-BOARD DIAGNOSIS[DYNAMIC</a>

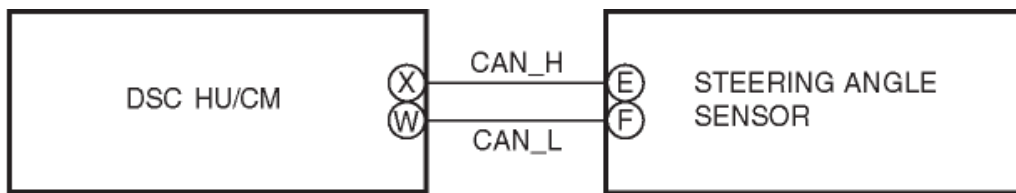


			STABILITY CONTROL (DSC)].)
			No DTC troubleshooting completed.

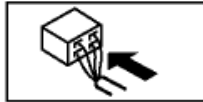
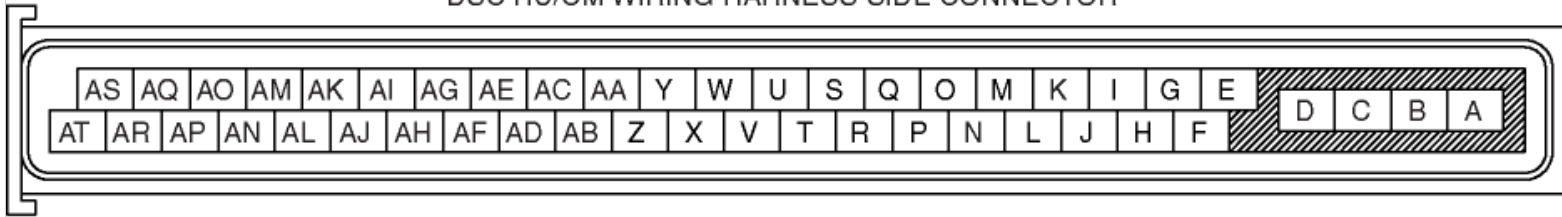
2008 - MX-5 - Brakes

DTC C1295, C1307, C1937, C1938, C1956 [DYNAMIC STABILITY CONTROL (DSC)]

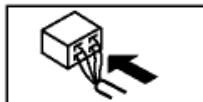
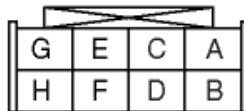
DTC	C1295, C1307, C1937, C1938, C1956	Steering angle sensor system
DETECTION CONDITION	<ul style="list-style-type: none"><li>• C1295<ul style="list-style-type: none"><li>▪ The steering angle sensor detects an internal abnormality.</li></ul></li><li>• C1307<ul style="list-style-type: none"><li>▪ The steering angle sensor detects an abnormality in the signal.</li></ul></li><li>• C1937<ul style="list-style-type: none"><li>▪ The difference between the steering angle calculated by each sensor and the steering angle from the steering angle sensor exceeds specification.</li></ul></li><li>• C1938<ul style="list-style-type: none"><li>▪ The difference between the steering angle previously received and the steering angle received at this time is not within specification.</li><li>▪ The signal from the steering angle sensor remains unchanged when the steering angle is turned to the right and left.</li></ul></li><li>• C1956<ul style="list-style-type: none"><li>▪ There is no signal received from the steering angle sensor.</li></ul></li></ul>	
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Improper installation or positioning of the steering angle sensor</li><li>• Steering angle sensor malfunction</li><li>• Steering wheel is off-center</li><li>• Poor connection at connectors (female terminal)</li></ul>	



DSC HU/CM WIRING HARNESS-SIDE CONNECTOR



STEERING ANGLE SENSOR WIRING HARNESS-SIDE CONNECTOR



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT STEERING WHEEL FOR OFF-CENTER</b> <ul style="list-style-type: none"><li>• Drive the vehicle and inspect the steering wheel position while driving in a straight line.</li><li>• Is the steering wheel off-center?</li></ul>	YesGo to the next step.
		No Inspect and adjust the front wheel alignment to correct the steering wheel alignment.  (See <b>FRONT WHEEL ALIGNMENT</b> .)  Go to Step 3.
2	<b>INSPECT STEERING ANGLE SENSOR</b> <ul style="list-style-type: none"><li>• Inspect the steering angle sensor.  (See <b>STEERING ANGLE SENSOR INSPECTION</b>.)</li><li>• Is the steering angle sensor normal?</li></ul>	YesGo to the next step.
		No Replace the steering angle sensor, then go to the next step.  (See <b>STEERING ANGLE SENSOR REMOVAL/INSTALLATION</b> .)
3	<b>VERIFY DTC TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"><li>• Clear the DTC from the memory.  (See <b>ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</b>.)</li><li>• Are the same DTCs present?</li></ul>	YesReplace the DSC HU/CM, then go to the next step.  (See <b>DSC HU/CM REMOVAL/INSTALLATION</b> .)
		NoGo to the next step.
	<b>VERIFY AFTER REPAIR PROCEDURE</b>	

4	<ul style="list-style-type: none"><li>• Are any other DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection. (See <b>ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</b> .)
		No	DTC troubleshooting completed.

## 2008 - MX-5 - Brakes

### DTC C1306 [DYNAMIC STABILITY CONTROL (DSC)]

#### NOTE:

- The initialization value of the steering angle sensor is stored using the battery power supply. Therefore, the battery power supply of the steering angle sensor is cut and the stored initialization value is cleared when any of the following items are performed. DTC C1306 is stored in the memory.
  - Negative battery cable disconnection
  - Steering angle sensor connector disconnection
  - Fuse (ROOM 15A) removal
  - Wiring harness disconnection between battery and steering angle sensor connector

DTC	C1306	Steering angle sensor (abnormal initialization) system
<b>DETECTION CONDITION</b>		<ul style="list-style-type: none"> <li>The steering angle sensor detects that the initialization procedure has not been performed.</li> </ul>
<b>POSSIBLE CAUSE</b>		<ul style="list-style-type: none"> <li>The initialization procedure for the steering angle sensor has not been performed.</li> <li>Steering angle sensor malfunction</li> <li>The negative battery cable connector was disconnected previously.</li> <li>The steering angle sensor connector was disconnected previously.</li> <li>The fuse (ROOM 15A) was removed previously.</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY INITIALIZATION PROCEDURE.</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has the steering angle sensor initialization procedure been performed?</li> </ul>	No Perform the steering angle sensor initialization procedure, then go to the next step. (See <a href="#">STEERING ANGLE SENSOR INITIALIZATION PROCEDURE.</a> )

2	<b>VERIFY DTC TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"><li>• Clear the DTC from the memory.  (See <b>ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</b>.)</li><li>• Is the same DTC present?</li></ul>	Yes	Repeat the inspection from Step 1.  If the malfunction occurs again, replace the steering angle sensor, then go to the next step.  (See <b>STEERING ANGLE SENSOR REMOVAL/INSTALLATION</b> .)
		No	Go to the next step.
3	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Are any other DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection.  (See <b>ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</b> .)
		No	DTC troubleshooting completed.

## 2008 - MX-5 - Brakes

### DTC C1805 [DYNAMIC STABILITY CONTROL (DSC)]

<b>DTC</b>	<b>C1805</b>	<b>Incorrect DSC HU/CM installed</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The programmed vehicle information and the data received from the CAN do not correspond.</li> </ul>	
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>The correct DSC HU/CM is not installed.</li> </ul>	

### Diagnostic procedure

STEP	INSPECTION		ACTION
1	<b>VERIFY THAT THE CORRECT DSC HU/CM IS INSTALLED</b> <ul style="list-style-type: none"> <li>Verify the part number of the DSC HU/CM.</li> <li>Is the part number correct?</li> </ul>	Yes	Go to the next step.
		No	After replacing the DSC HU/CM, go to Step 3. (See <a href="#">DSC HU/CM REMOVAL/INSTALLATION.</a> )
2	<b>PERFORM CONFIGURATION</b> <ul style="list-style-type: none"> <li>Was configuration performed normally?</li> </ul>	Yes	Go to the next step.
		No	Replace the DSC HU/CM, then go to the next step. (See <a href="#">DSC HU/CM REMOVAL/INSTALLATION.</a> )
3	<b>VERIFY DTC TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the memory. (See <a href="#">ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)].</a>)</li> <li>Is the same DTC present?</li> </ul>	Yes	Repeat the inspection from Step 1.  If the malfunction recurs, replace the DSC HU/CM, then go to the next step. (See <a href="#">DSC HU/CM REMOVAL/INSTALLATION.</a> )
		No	Go to the next step.
4	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Are any other DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">ON-BOARD DIAGNOSIS[DYNAMIC</a>

			STABILITY CONTROL (DSC)1.)
			No DTC troubleshooting completed.

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## 2008 - MX-5 - Brakes

### DTC C1994 [DYNAMIC STABILITY CONTROL (DSC)]

DTC	C1994	DSC control system
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>DSC control for the front wheels continues for <b>10 s or more</b>.</li> <li>During DSC control, the pressure increase operation to any of the all four wheels does not occur for <b>1.3 s or more</b>.</li> </ul>	
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>This does not indicate a malfunction since constant control over extended period of time is inhibited to protect the DSC solenoid valve inside the DSC HU.</li> </ul>	

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY DTC TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"> <li>Clear the DTC from the memory. (See <a href="#">ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</a>.)</li> <li>Are the same DTCs present?</li> </ul>	Yes Replace the DSC HU/CM, then go to the next step.  (See <a href="#">DSC HU/CM REMOVAL/INSTALLATION</a> .)
		No Go to the next step.
2	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Are any other DTCs present?</li> </ul>	Yes Go to the applicable DTC inspection.  (See <a href="#">ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</a> .)
		No DTC troubleshooting completed.

## 2008 - MX-5 - Brakes

### DTC B2900, C1805 [DYNAMIC STABILITY CONTROL (DSC)]

<b>DTC</b>	<b>B2900, C1805</b>	<b>Incorrect DSC HU/CM installed</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The programmed vehicle information and the data received from the CAN do not correspond.</li> </ul>	
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>The correct DSC HU/CM is not installed.</li> </ul>	

#### Diagnostic procedure

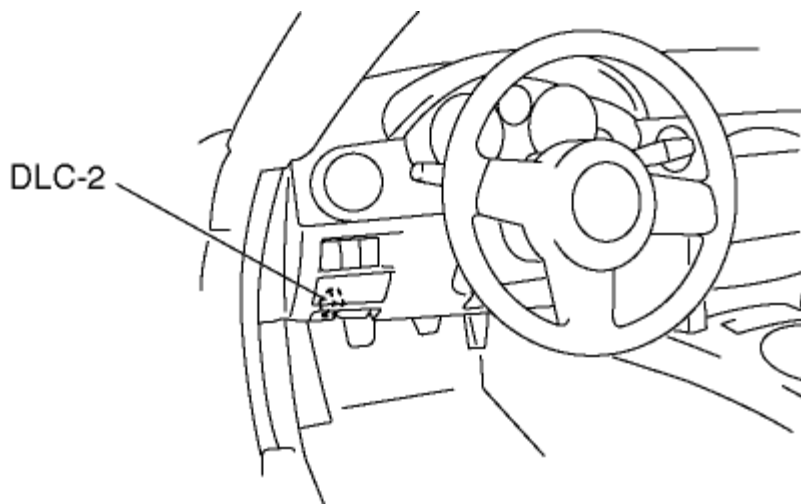
STEP	INSPECTION	ACTION	
1	<b>VERIFY THAT THE CORRECT DSC HU/CM IS INSTALLED</b> <ul style="list-style-type: none"> <li>Verify the part number of the DSC HU/CM.</li> <li>Is the part number correct?</li> </ul>	Yes	Go to the next step.
		No	After replacing the DSC HU/CM, go to Step 3. (See <a href="#">DSC HU/CM REMOVAL/INSTALLATION.</a> )
2	<b>PERFORM CONFIGURATION</b> <ul style="list-style-type: none"> <li>Was configuration performed normally?</li> </ul>	Yes	Go to the next step.
		No	Replace the DSC HU/CM, then go to the next step. (See <a href="#">DSC HU/CM REMOVAL/INSTALLATION.</a> )
3	<b>VERIFY DTC TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the memory. (See <a href="#">ON-BOARD DIAGNOSIS [DYNAMIC STABILITY CONTROL (DSC)].</a>)</li> <li>Is the same DTC present?</li> </ul>	Yes	Repeat the inspection from Step 1.  If the malfunction recurs, replace the DSC HU/CM, then go to the next step. (See <a href="#">DSC HU/CM REMOVAL/INSTALLATION.</a> )
		No	Go to the next step.
4	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Are any other DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">ON-BOARD DIAGNOSIS [DYNAMIC</a>

			STABILITY CONTROL (DSC)].)
			No DTC troubleshooting completed.

## 2008 - MX-5 - Body and Accessories

### DTC INSPECTION [ADVANCED KEYLESS SYSTEM]

1. Connect the M-MDS to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)

1. Select "Self Test".
2. Select "Modules".
3. Select "RKE".

- When using the PDS (Pocket PC)

1. Select "Module Tests".
2. Select "RKE".
3. Select "Self Test".

3. Verify the DTC according to the directions on the screen.

- If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.

4. After completion of repairs, clear all DTCs stored in the keyless control module. (See [CLEARING DTC \[ADVANCED KEYLESS SYSTEM\]](#).)

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## 2008 - MX-5 - Body and Accessories

### FOREWORD [ADVANCED KEYLESS SYSTEM]

#### Outline

- The OBD (on-board diagnostic) system has the following functions:
  - Malfunction detection function: Detects malfunctions in the keyless control system and outputs DTCs.
  - Data monitor function: Reads out specific input/output signals and the system status.
- Diagnostic DTCs can be read/cleared using the M-MDS.

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## 2008 - MX-5 - Body and Accessories

### PID/DATA MONITOR TABLE [ADVANCED KEYLESS SYSTEM]

#### PID/data monitor table

PID name (definition)	Data contents	Unit/Operation	Terminal
DTC_CNT	Number of continuous DTCs	—	—
RPM	Engine speed	RPM	4Z, 4AA
VSS	Vehicle speed	KPH, MPH	4Z, 4AA
VPWR	Supply voltage	V	1F
NUMCARD	Number of programmed card keys	—	—
NUMKEY*	Number of programmed key ID numbers	—	—
DRSW_D	Door switch (driver's door)	CLOSE/OPEN	4T
DRSW_ALL	Door switch (all door)	CLOSE/OPEN	4Q
REQ_SW_D	Request switch (driver's door)	On/Off	4H
REQ_SW_P	Request switch (passenger's door)	On/Off	4J
REQ_SW_BK	Request switch (trunk lid)	On/Off	4L
LOCK_SW_D	Door lock-link switch (driver's side)	On/Off	4I, 4E
CLS_LOCK	Door lock switch (lock)	On/Off	4B
CLS_UNLOCK	Door lock switch (unlock)	On/Off	4B
KCS_LOCK	Key cylinder switch (lock)	On/Off	4G
KCS_UNLOCK	Key cylinder switch (unlock)	On/Off	4G

IMMOBI	Immobilizer system equipped or not	On*/Off	–
TR_KEY_SW	Trunk key cylinder switch	On/Off	4K
TR/LG_SW	Trunk compartment light switch	CLOSE/OPEN	3Z
IG_KEY_IN	Key reminder switch	Key-In/Key-Out	3O
IG_SW_ST	Ignition switch (Push switch)	Pushed/Not Pushed	3N
PWR_IG1	Power supply (IG1)	On/Off	3B
PWR_ACC	Power supply (ACC)	On/Off	3I
HOOD_SW	Hood latch switch	CLOSE/OPEN	4V
LOCK_SW_P	Door lock-link switch (passenger's side)	On/Off	4R

\*

Vehicles with immobilizer system

Active command mode table

Command name	Output part name	Unit/Operation	Terminal
BZR_OUT	Keyless buzzer	On/Off	4Y
BZR_INN	Interior buzzer (Instrument cluster)	On/Off	4Z, 4AA
LNP_RED	Keyless warning light (red)	On/Off	4Z, 4AA
LNP_GREEN	Keyless indicator light (green)	On/Off	4Z, 4AA
HAZARD	Hazard warning light	On/Off	4N
ANT_RF	Keyless antenna (exterior, RF)	On/Off	2A, 2B
ANT_LF	Keyless antenna (exterior, LF)	On/Off	2C, 2D
ANT_BK	Keyless antenna (exterior, rear)	On/Off	2E, 2F
ANT_INN1	Keyless antenna (Interior, trunk)	On/Off	2G, 2H
ANT_INN2	Keyless antenna (Interior rear)	On/Off	2I, 2J

ANT_INN3	Keyless antenna (Interior, middle)	On/Off	2K, 2L
ANT_INN4	Keyless antenna (Interior, front)	On/Off	3G, 3H
DR_LOCK	All doors lock	Off/Lock	1A, 1C
DR_UNLOCK	All doors unlock	Off/Unlock	1A, 1C
2STG_UNLK	All doors unlock	Off/Unlock	1A, 1D

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## 2008 - MX-5 - Body and Accessories

### DTC TABLE [ADVANCED KEYLESS SYSTEM]

DTC No.	Description	Page
B1342	Keyless control module internal malfunction	(See <a href="#">DTC B1342 [ADVANCED KEYLESS SYSTEM]</a> )
B1134	Unprogrammed card key	(See <a href="#">DTC B1134 [ADVANCED KEYLESS SYSTEM]</a> )
B2477	Configuration error	(See <a href="#">DTC B2477 [ADVANCED KEYLESS SYSTEM]</a> )
B1317	Keyless control module power supply voltage increases.	(See <a href="#">DTC B1317/B1318 [ADVANCED KEYLESS SYSTEM]</a> )
B1318	Keyless control module power supply voltage decreases	(See <a href="#">DTC B1317/B1318 [ADVANCED KEYLESS SYSTEM]</a> )
B2170	Push switch (Steering lock unit)	(See <a href="#">DTC B2170 [ADVANCED KEYLESS SYSTEM]</a> )
B1126	Steering lock unit internal malfunction	(See <a href="#">DTC B1126 [ADVANCED KEYLESS SYSTEM]</a> )
U0236	Steering lock unit communication system	(See <a href="#">DTC U0236 [ADVANCED KEYLESS SYSTEM]</a> )
B1093	Steering lock unit communication error	(See <a href="#">DTC B1093 [ADVANCED KEYLESS SYSTEM]</a> )
U0214	Keyless receiver	(See <a href="#">DTC U0214 [ADVANCED KEYLESS SYSTEM]</a> )
B1133	Keyless antenna (exterior, RF)	(See <a href="#">DTC B1133 [ADVANCED KEYLESS SYSTEM]</a> )
B1132	Keyless antenna (exterior, LF)	(See <a href="#">DTC B1132 [ADVANCED KEYLESS SYSTEM]</a> )
B1127	Keyless antenna (Interior, trunk)	(See <a href="#">DTC B1127 [ADVANCED KEYLESS SYSTEM]</a> )
B1128	Keyless antenna (Interior, rear)	(See <a href="#">DTC B1128 [ADVANCED KEYLESS SYSTEM]</a> )
B1131	Keyless antenna (exterior, rear)	(See <a href="#">DTC B1131 [ADVANCED KEYLESS SYSTEM]</a> )

B1129	Keyless antenna (Interior, middle)	(See <a href="#">DTC B1129 [ADVANCED KEYLESS SYSTEM]</a> )
B112A	Keyless antenna (Interior, front)	(See <a href="#">DTC B112A [ADVANCED KEYLESS SYSTEM]</a> )
U0323	Communication error to instrument cluster	(See <a href="#">MULTIPLEX COMMUNICATION SYSTEM [MULTIPLEX COMMUNICATION SYSTEM]</a> )
U0100	Communication error to PCM	(See <a href="#">MULTIPLEX COMMUNICATION SYSTEM [MULTIPLEX COMMUNICATION SYSTEM]</a> )
U0073	Control module communication error	(See <a href="#">MULTIPLEX COMMUNICATION SYSTEM [MULTIPLEX COMMUNICATION SYSTEM]</a> )
U0207	Communication error to power retractable hardtop control module	(See <a href="#">MULTIPLEX COMMUNICATION SYSTEM [MULTIPLEX COMMUNICATION SYSTEM]</a> )
U2023	Error signal from CAN related module	(See <a href="#">MULTIPLEX COMMUNICATION SYSTEM [MULTIPLEX COMMUNICATION SYSTEM]</a> )

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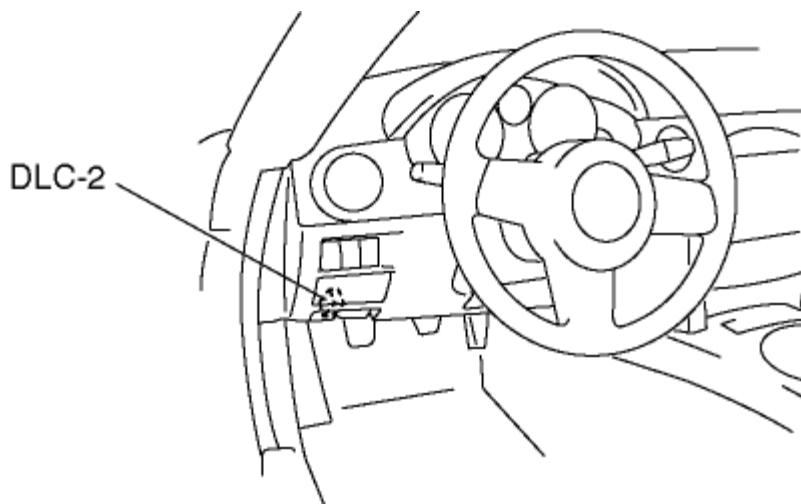
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## 2008 - MX-5 - Body and Accessories

### CLEARING DTC [ADVANCED KEYLESS SYSTEM]

1. Connect the M-MDS to the DLC 2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

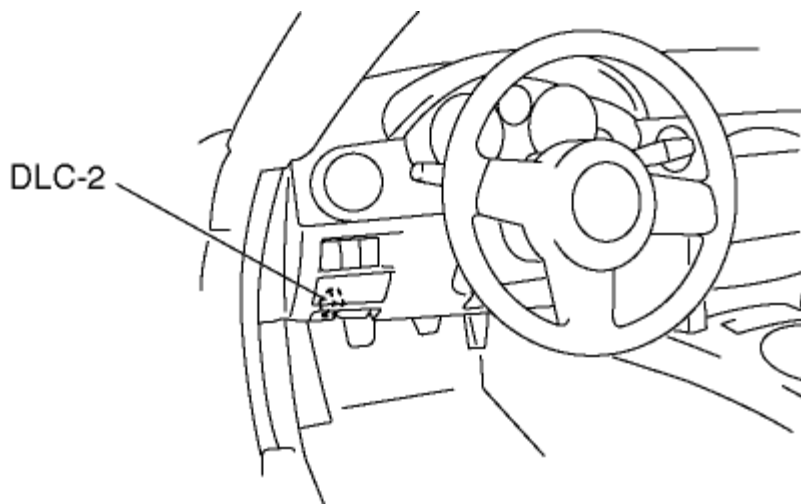
- When using the IDS (laptop PC)
  1. Select "Self Test".
  2. Select "Modules".
  3. Select "RKE".
- When using the PDS (Pocket PC)
  1. Select "Module Tests".
  2. Select "RKE".
  3. Select "Self Test".

3. Verify the DTC according to the directions on the screen.
4. Press the clear button on the DTC screen to clear the DTC.
5. Verify that no DTCs are displayed.

## 2008 - MX-5 - Body and Accessories

### PID/DATA MONITOR INSPECTION [ADVANCED KEYLESS SYSTEM]

1. Connect the M-MDS to the DLC 2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)

1. Select "DataLogger".
2. Select "Modules".
3. Select "RKE".

- When using the PDS (Pocket PC)

1. Select "Module Tests".
2. Select "RKE".
3. Select "DataLogger".

3. Select the applicable PID from the PID table.
4. Verify the PID data according to the directions on the screen.


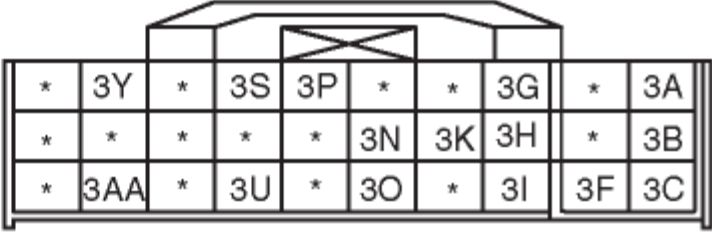
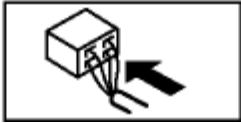
#### NOTE:

- The PID data screen function is used for monitoring the calculated value of input/output signals in the module. Therefore, if the monitored value of the output parts is not within the specification, it is necessary to inspect the monitored value of input parts corresponding to the applicable output part control. In addition, because the system does not display an output part malfunction as an abnormality in the monitored value, it is necessary to inspect the output parts individually.



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DTC B112A [ADVANCED KEYLESS SYSTEM]

DTC B112A	Keyless antenna (interior, front)
DETECTION CONDITION	Keyless antenna dose not operated.
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Keyless antenna (interior, front) malfunction</li><li>• Open or short circuit in wiring harness between keyless control module and keyless antenna</li><li>• Keyless control module malfunction</li></ul>
<div><div>KEYLESS ANTENNA HARNESS SIDE CONNECTOR</div><div></div></div> <div><div>KEYLESS CONTROL MODULE HARNESS SIDE CONNECTOR</div><div></div><div></div></div>	

Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT COMMUNICATION CIRCUIT FOR CONTINUITY</b> <ul style="list-style-type: none"><li>• Disconnect keyless control module connector and keyless antenna (interior, front) connector.</li><li>• Inspect the continuity between the following connector terminals.</li></ul>	<ul style="list-style-type: none"><li>• Replace keyless antenna (interior, front).</li></ul> <p>(See <b>KEYLESS ANTENNA REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</b>)</p> <ul style="list-style-type: none"><li>• Go to next step.</li></ul>
		<ul style="list-style-type: none"><li>• Repair the wiring harness between the</li></ul>

	<ul style="list-style-type: none"> <li>▪ keyless control module: 3G— keyless antenna: A</li> <li>▪ keyless control module: 3H— keyless antenna: B</li> </ul> <ul style="list-style-type: none"> <li>• Is there continuity?</li> </ul>		<p>keyless antenna (interior, front) and keyless control module.</p> <ul style="list-style-type: none"> <li>• Go to next step.</li> </ul>
2	<b>INSPECT KEYLESS CONTROL MODULE</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position.</li> <li>• Is the DTC displayed? <ul style="list-style-type: none"> <li>▪ M-MDS: B112A</li> </ul> </li> </ul>	<div>Yes</div> <p>Replace the keyless control module and perform the resetting procedure for the advanced keyless system when replacing the keyless control module.</p> <p>(See <a href="#">KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a>.)</p> <p>(See <a href="#">CARD KEY ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a>)</p> <p>(See <a href="#">STEERING LOCK UNIT ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a>)</p> <p>(See <a href="#">KEYLESS CONTROL MODULE CONFIGURATION [ADVANCED KEYLESS SYSTEM]</a>)</p> <p>(See <a href="#">IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</a>)</p> <p>(See <a href="#">SECURITY ACCESS PROCEDURE [ADVANCED KEYLESS SYSTEM]</a>)</p>	
		No	DTC troubleshooting completed.

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DTC B1342 [ADVANCED KEYLESS SYSTEM]

DTC B1342	Keyless control module internal malfunction.
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Malfunction in the keyless control module internal circuit</li></ul>

Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT KEYLESS CONTROL MODULE</b> <ul style="list-style-type: none"><li>Turn the ignition switch to the ON position.</li><li>Is the DTC displayed?<ul style="list-style-type: none"><li>M-MDS: B1342</li></ul></li></ul>	Yes Replace the keyless control module and perform the resetting procedure for the advanced keyless system when replacing the keyless control module.  (See <a href="#">KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> .)  (See <a href="#">CARD KEY ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a> )  (See <a href="#">STEERING LOCK UNIT ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a> )  (See <a href="#">KEYLESS CONTROL MODULE CONFIGURATION [ADVANCED KEYLESS SYSTEM]</a> )  (See <a href="#">IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</a> )  (See <a href="#">SECURITY ACCESS PROCEDURE [ADVANCED KEYLESS SYSTEM]</a> )
		No DTC troubleshooting completed.



## 2008 - MX-5 - Body and Accessories

### DTC B1134 [ADVANCED KEYLESS SYSTEM]

DTC B1134	Unprogrammed card key.
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Unprogrammed card key.</li> <li>• Malfunction in the keyless control module internal circuit</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY NUMBER OF REGISTERED CARD KEYS</b> <ul style="list-style-type: none"> <li>• Using the M-MDS, perform the PID/data monitor inspection and confirm the number of registered keys.</li> </ul> (See <a href="#">PID/DATA MONITOR TABLE [ADVANCED KEYLESS SYSTEM]</a> .) <ul style="list-style-type: none"> <li>• Is card key registered?</li> </ul>	Yes <p>Replace the keyless control module and perform the resetting procedure for the advanced keyless system when replacing the keyless control module.</p> <p>(See <a href="#">KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a>.)</p> <p>(See <a href="#">CARD KEY ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a>)</p> <p>(See <a href="#">STEERING LOCK UNIT ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a>)</p> <p>(See <a href="#">KEYLESS CONTROL MODULE CONFIGURATION [ADVANCED KEYLESS SYSTEM]</a>)</p> <p>(See <a href="#">IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</a>)</p> <p>(See <a href="#">SECURITY ACCESS PROCEDURE [ADVANCED KEYLESS SYSTEM]</a>)</p>
		No <ul style="list-style-type: none"> <li>• Using the M-MDS, register a card key if necessary.</li> </ul> <p>(See <a href="#">CARD KEY ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a>)</p> <ul style="list-style-type: none"> <li>• Go to the next step.</li> </ul>

2	<b>INSPECT KEYLESS CONTROL MODULE</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position.</li> <li>• Is the DTC displayed? <ul style="list-style-type: none"> <li>▪ M-MDS: B1134</li> </ul> </li> </ul>	<div> Yes Replace the keyless control module and perform the resetting procedure for the advanced keyless system when replacing the keyless control module.    (See <a href="#">KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a>.)    (See <a href="#">CARD KEY ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a>)    (See <a href="#">STEERING LOCK UNIT ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a>)    (See <a href="#">KEYLESS CONTROL MODULE CONFIGURATION [ADVANCED KEYLESS SYSTEM]</a>)    (See <a href="#">IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</a>)    (See <a href="#">SECURITY ACCESS PROCEDURE [ADVANCED KEYLESS SYSTEM]</a>) </div> <div> No DTC troubleshooting completed. </div>
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## 2008 - MX-5 - Body and Accessories

### DTC B2477 [ADVANCED KEYLESS SYSTEM]

DTC B2477	Configuration error.
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>Keyless control module configuration has not been performed correctly.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Keyless control module configuration error.</li> <li>Malfunction in the keyless control module internal circuit</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>PERFORM INSTRUMENT KEYLESS CONTROL MODULE CONFIGURATION</b> <ul style="list-style-type: none"> <li>Perform keyless control module configuration.</li> <li>Is B2477 displayed?</li> </ul>	Yes Replace the keyless control module and perform the resetting procedure for the advanced keyless system when replacing the keyless control module.  (See <a href="#">KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> .)  (See <a href="#">CARD KEY ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a> )  (See <a href="#">STEERING LOCK UNIT ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a> )  (See <a href="#">KEYLESS CONTROL MODULE CONFIGURATION [ADVANCED KEYLESS SYSTEM]</a> )  (See <a href="#">IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</a> )  (See <a href="#">SECURITY ACCESS PROCEDURE [ADVANCED KEYLESS SYSTEM]</a> )
		No <ul style="list-style-type: none"> <li>Go to the next step.</li> </ul>
2	<b>VERIFY TROUBLESHOOTING OF DTC B2477 COMPLETED</b> <ul style="list-style-type: none"> <li>Clear the DTC from the</li> </ul>	Yes Go to the applicable DTC inspection.
		No DTC troubleshooting completed.

	memory.		
	<ul style="list-style-type: none"><li>• Is any DTC displayed?</li></ul>		



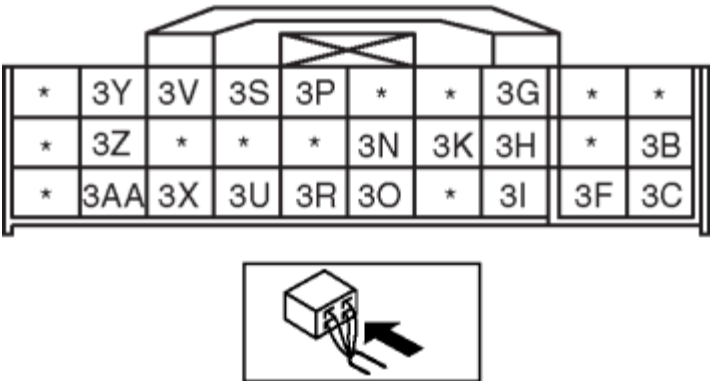
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## 2008 - MX-5 - Body and Accessories

### DTC B1317/B1318 [ADVANCED KEYLESS SYSTEM]

DTC	B1317	Keyless control module power supply voltage increases (16.1 V or more)
	B1318	Keyless control module power supply voltage decreases (less than 9 V)
<b>DETECTION CONDITION</b>		<ul style="list-style-type: none"> <li>When the keyless control module power supply voltage is not <b>within 9–16 V</b>.</li> </ul>
<b>POSSIBLE CAUSE</b>		<ul style="list-style-type: none"> <li>Open or short circuit in wiring harness between battery and keyless control module</li> <li>Battery malfunction</li> <li>Keyless control module malfunction</li> </ul>
<p>KEYLESS CONTROL MODULE HARNESS SIDE CONNECTOR</p> 		

### Diagnostic procedure

Step	Inspection	Action
1	<b>INSPECT FUSE</b> <ul style="list-style-type: none"> <li>Remove the ROOM 15 A fuse.</li> <li>Is the fuse normal?</li> </ul>	YesGo to the next step.
		NoReplace the fuse.
2	<b>INSPECT BATTERY</b>	YesGo to the next step.

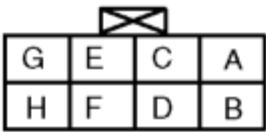
	<ul style="list-style-type: none"> <li>• Measure the battery positive voltage.</li> <li>• Is the voltage <b>9 V–16 V</b>?</li> </ul>	No	<p>The battery has a malfunction.</p> <p>Inspect the charge/discharge system.</p>
3	<b>INSPECT WIRING HARNESS BETWEEN BATTERY AND FUSE BLOCK</b> <ul style="list-style-type: none"> <li>• Measure the fuse block terminal voltage.</li> <li>• Is the voltage <b>9 V–16 V</b>?</li> </ul>	Yes	Install the fuse, then go to the next step.
		No	Repair the wiring harness between the fuse block and battery.
4	<b>INSPECT FUSE BLOCK</b> <ul style="list-style-type: none"> <li>• Measure the voltage at the fuse block terminal voltage.</li> <li>• Is the voltage <b>9 V–16 V</b>?</li> </ul>	Yes	Go to the next step.
		No	Repair the wiring harness between the fuse block and battery.
5	<b>INSPECT WIRING HARNESS BETWEEN FUSE BLOCK AND KEYLESS CONTROL MODULE</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position.</li> <li>• Measure the keyless control module terminal 3B voltage.</li> <li>• Is the voltage <b>9 V–16 V</b>?</li> </ul>	Yes	<p>Replace the keyless control module and perform the resetting procedure for the advanced keyless system when replacing the keyless control module.</p> <p>(See <b>KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</b>.)</p> <p>(See <b>CARD KEY ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</b>)</p> <p>(See <b>STEERING LOCK UNIT ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</b>)</p> <p>(See <b>KEYLESS CONTROL MODULE CONFIGURATION [ADVANCED KEYLESS SYSTEM]</b>)</p> <p>(See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</b>)</p> <p>(See <b>SECURITY ACCESS PROCEDURE [ADVANCED KEYLESS SYSTEM]</b>)</p>
		No	Repair the wiring harness between the BCM and keyless control module.

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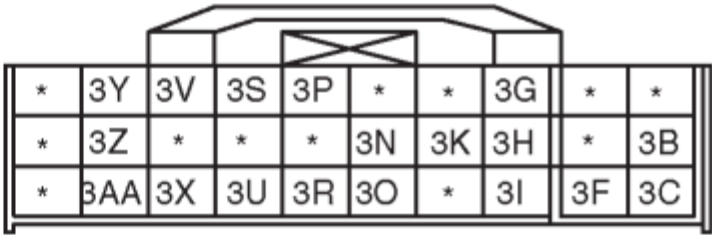
DTC B2170 [ADVANCED KEYLESS SYSTEM]


DTC B2170	Push switch.
DETECTION CONDITION	<ul style="list-style-type: none"><li>• Detect the push switch OFF signal when ignition switch is ON position.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Steering lock unit malfunction</li><li>• Open or short circuit in wiring harness between keyless control module and steering lock unit</li><li>• Keyless control module malfunction</li></ul>

STEERING LOCK UNIT HARNESS SIDE CONNECTOR



KEYLESS CONTROL MODULE HARNESS SIDE CONNECTOR





Diagnostic procedure

STEP	INSPECTION	ACTION
1	<div><b>INSPECT COMMUNICATION CIRCUIT FOR CONTINUITY</b><ul style="list-style-type: none"><li>• Disconnect keyless control module connector and steering lock unit connector.</li><li>• Is there continuity between keyless control</li></ul></div>	<div>YesReplace the steering lock unit and perform the resetting procedure for the steering lock unit.  (See <b>STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.</b>)  (See <b>STEERING LOCK UNIT ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</b>)</div>

	module terminal 3N and steering lock unit terminal A?	No	Repair the wiring harness between the steering lock unit and keyless control module.
2	<b>INSPECT KEYLESS CONTROL MODULE</b> <ul style="list-style-type: none"><li>• Turn the ignition switch to the ON position.</li><li>• Is the DTC displayed?<ul style="list-style-type: none"><li>▪ M-MDS: B2170</li></ul></li></ul>	Yes	Replace the keyless control module and perform the resetting procedure for the advanced keyless system when replacing the keyless control module.  (See <b>KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</b> .)  (See <b>CARD KEY ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</b> )  (See <b>STEERING LOCK UNIT ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</b> )  (See <b>KEYLESS CONTROL MODULE CONFIGURATION [ADVANCED KEYLESS SYSTEM]</b> )  (See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]</b> )  (See <b>SECURITY ACCESS PROCEDURE [ADVANCED KEYLESS SYSTEM]</b> )
		No	DTC troubleshooting completed.



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### DTC B1126 [ADVANCED KEYLESS SYSTEM]

DTC B1126	Steering lock unit internal malfunction.
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"><li>• Detect the steering lock unit malfunction signal.</li></ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"><li>• Steering lock unit malfunction</li></ul>

### Diagnostic procedure

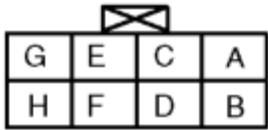
STEP	INSPECTION	ACTION
1	<b>INSPECT STEERING LOCK UNIT</b> <ul style="list-style-type: none"><li>• Turn the ignition switch to the ON position.</li><li>• Is the DTC displayed?<ul style="list-style-type: none"><li>▪ M-MDS: B1126</li></ul></li></ul>	Yes Replace the steering lock unit and perform the resetting procedure for the steering lock unit.  (See <b>STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.</b> )  (See <b>STEERING LOCK UNIT ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</b> )
		No DTC troubleshooting completed.

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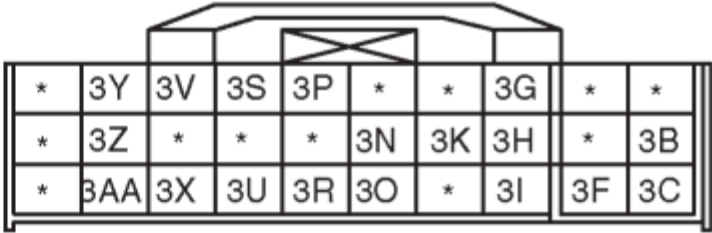
DTC U0236 [ADVANCED KEYLESS SYSTEM]


DTC U0236	Steering lock unit communication system.
DETECTION CONDITION	<ul style="list-style-type: none"><li>Steering lock unit communication error</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Steering lock unit malfunction</li><li>Open or short circuit in wiring harness between keyless control module and steering lock unit</li><li>Keyless control module malfunction</li></ul>

STEERING LOCK UNIT HARNESS SIDE CONNECTOR



KEYLESS CONTROL MODULE HARNESS SIDE CONNECTOR





Diagnostic procedure

STEP	INSPECTION		ACTION
1	<b>INSPECT COMMUNICATION CIRCUIT FOR CONTINUITY</b>	Yes	<ul style="list-style-type: none"><li>Replace the steering lock unit and perform the resetting procedure for the steering lock unit.</li></ul> <p>(See <b>STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.</b>)</p> <p>(See <b>STEERING LOCK UNIT ID CODE REGISTRATION [ADVANCED KEYLESS</b></p>
	<ul style="list-style-type: none"><li>Disconnect keyless control module connector and steering lock unit connector.</li><li>Is there continuity between keyless control</li></ul>		

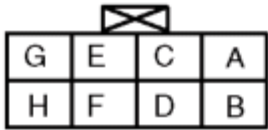
	<p>module terminal 3P and steering lock unit terminal G?</p>		<p><b>SYSTEM])</b></p> <ul style="list-style-type: none"> <li>Go to the next step.</li> </ul>
		No	<ul style="list-style-type: none"> <li>Repair the wiring harness between the steering lock unit and keyless control module.</li> <li>Go to next step.</li> </ul>
2	<p><b>INSPECT KEYLESS CONTROL MODULE</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position.</li> <li>Is the DTC displayed? <ul style="list-style-type: none"> <li>M-MDS: U0236</li> </ul> </li> </ul>	Yes	<p>Replace the keyless control module and perform the resetting procedure for the advanced keyless system when replacing the keyless control module.</p> <p>(See <b>KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</b>.)</p> <p>(See <b>CARD KEY ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</b>)</p> <p>(See <b>STEERING LOCK UNIT ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</b>)</p> <p>(See <b>KEYLESS CONTROL MODULE CONFIGURATION [ADVANCED KEYLESS SYSTEM]</b>)</p> <p>(See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</b>)</p> <p>(See <b>SECURITY ACCESS PROCEDURE [ADVANCED KEYLESS SYSTEM]</b>)</p>
		No	<p>DTC troubleshooting completed.</p>

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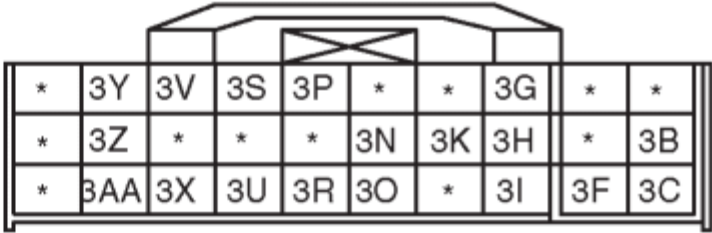
DTC B1093 [ADVANCED KEYLESS SYSTEM]


DTC B1093	Unprogrammed steering lock unit.
DETECTION CONDITION	<ul style="list-style-type: none"><li>Unprogrammed steering lock unit.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Steering lock unit malfunction</li><li>Open or short circuit in wiring harness between keyless control module and steering lock unit</li><li>Keyless control module malfunction</li></ul>

STEERING LOCK UNIT HARNESS SIDE CONNECTOR



KEYLESS CONTROL MODULE HARNESS SIDE CONNECTOR





Diagnostic procedure

STEP	INSPECTION		ACTION
1	<b>INSPECT COMMUNICATION CIRCUIT FOR CONTINUITY</b>	Yes	<ul style="list-style-type: none"><li>Perform the resetting procedure for the steering lock unit.  (See <b>STEERING LOCK UNIT ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</b>)</li><li>Go to the next step.</li></ul>
	<ul style="list-style-type: none"><li>Disconnect keyless control module connector and steering lock unit connector.</li><li>Is there continuity between keyless control</li></ul>		

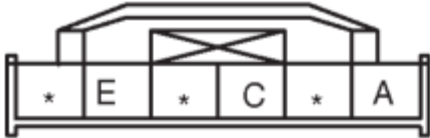
	module terminal 3P and steering lock unit terminal G?	No	<ul style="list-style-type: none"> <li>Repair the wiring harness between the steering lock unit and keyless control module.</li> <li>Go to next step.</li> </ul>
2	<b>INSPECT STEERING LOCK UNIT</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position.</li> <li>Is the DTC displayed? <ul style="list-style-type: none"> <li>M-MDS: B1093</li> </ul> </li> </ul>	Yes	<ul style="list-style-type: none"> <li>Replace the steering lock unit and perform the resetting procedure for the steering lock unit.</li> </ul> <p>(See <a href="#">STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.</a>)</p> <p>(See <a href="#">STEERING LOCK UNIT ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a>)</p> <ul style="list-style-type: none"> <li>Go to the next step.</li> </ul>
		No	DTC troubleshooting completed.
3	<b>INSPECT KEYLESS CONTROL MODULE</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position.</li> <li>Is the DTC displayed? <ul style="list-style-type: none"> <li>M-MDS: B1093</li> </ul> </li> </ul>	Yes	<p>Replace the keyless control module and perform the resetting procedure for the advanced keyless system when replacing the keyless control module.</p> <p>(See <a href="#">KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM].</a>)</p> <p>(See <a href="#">CARD KEY ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a>)</p> <p>(See <a href="#">STEERING LOCK UNIT ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a>)</p> <p>(See <a href="#">KEYLESS CONTROL MODULE CONFIGURATION [ADVANCED KEYLESS SYSTEM]</a>)</p> <p>(See <a href="#">IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]</a>)</p> <p>(See <a href="#">SECURITY ACCESS PROCEDURE [ADVANCED KEYLESS SYSTEM]</a>)</p>
		No	DTC troubleshooting completed.

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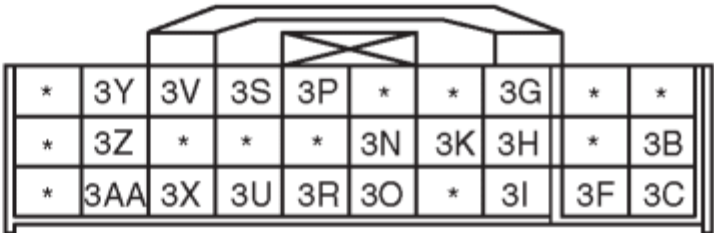
DTC U0214 [ADVANCED KEYLESS SYSTEM]


DTC U0214	Keyless receiver.
DETECTION CONDITION	<ul style="list-style-type: none"><li>When the keyless receiver power supply voltage is <b>less than 7.5 V</b>.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Keyless receiver malfunction</li><li>Open or short circuit in wiring harness between keyless control module and keyless receiver</li><li>Keyless control module malfunction</li></ul>

KEYLESS RECEIVER HARNESS SIDE CONNECTOR



KEYLESS CONTROL MODULE HARNESS SIDE CONNECTOR





Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT WIRING HARNESS BETWEEN KEYLESS RECEIVER AND GROUND</b> <ul style="list-style-type: none"><li>Disconnect keyless receiver connector.</li><li>Is there continuity between keyless receiver terminal E and ground?</li></ul>	YesGo to next step.
		<ul style="list-style-type: none"><li>Repair the wiring harness between the keyless receiver and ground.</li><li>Go to next step.</li></ul>




2	<b>INSPECT COMMUNICATION CIRCUIT FOR CONTINUITY</b> <ul style="list-style-type: none"><li>• Disconnect keyless control module connector and keyless receiver connector.</li><li>• Inspect the continuity between the following connector terminals.<ul style="list-style-type: none"><li>▪ keyless control module: 3S—keyless receiver: A</li><li>▪ keyless control module: 3U—keyless receiver: C</li></ul></li><li>• Is there continuity?</li></ul>	<table><tr><td>Yes</td><td>Go to next step.</td></tr><tr><td>No</td><td><ul style="list-style-type: none"><li>• Repair the wiring harness between the keyless receiver and keyless control module.</li><li>• Go to next step.</li></ul></td></tr></table>	Yes	Go to next step.	No	<ul style="list-style-type: none"><li>• Repair the wiring harness between the keyless receiver and keyless control module.</li><li>• Go to next step.</li></ul>
Yes	Go to next step.					
No	<ul style="list-style-type: none"><li>• Repair the wiring harness between the keyless receiver and keyless control module.</li><li>• Go to next step.</li></ul>					
3	<b>INSPECT KEYLESS RECEIVER POWER SUPPLY CIRCUIT</b> <ul style="list-style-type: none"><li>• Turn ignition switch to ON position.</li><li>• Measure voltage at terminal 3S of keyless control module connector.</li><li>• Is voltage <b>more than 7.5 V</b>?</li></ul>	<table><tr><td>Yes</td><td>Replace keyless receiver.  (See <a href="#">KEYLESS RECEIVER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a>)</td></tr><tr><td>No</td><td>Replace the keyless control module and perform the resetting procedure for the advanced keyless system when replacing the keyless control module.  (See <a href="#">KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a>.)  (See <a href="#">CARD KEY ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a>)  (See <a href="#">STEERING LOCK UNIT ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a>)  (See <a href="#">KEYLESS CONTROL MODULE CONFIGURATION [ADVANCED KEYLESS SYSTEM]</a>)  (See <a href="#">IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]</a>)  (See <a href="#">SECURITY ACCESS PROCEDURE [ADVANCED KEYLESS SYSTEM]</a>)</td></tr></table>	Yes	Replace keyless receiver.  (See <a href="#">KEYLESS RECEIVER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> )	No	Replace the keyless control module and perform the resetting procedure for the advanced keyless system when replacing the keyless control module.  (See <a href="#">KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> .)  (See <a href="#">CARD KEY ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a> )  (See <a href="#">STEERING LOCK UNIT ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a> )  (See <a href="#">KEYLESS CONTROL MODULE CONFIGURATION [ADVANCED KEYLESS SYSTEM]</a> )  (See <a href="#">IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]</a> )  (See <a href="#">SECURITY ACCESS PROCEDURE [ADVANCED KEYLESS SYSTEM]</a> )
Yes	Replace keyless receiver.  (See <a href="#">KEYLESS RECEIVER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> )					
No	Replace the keyless control module and perform the resetting procedure for the advanced keyless system when replacing the keyless control module.  (See <a href="#">KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> .)  (See <a href="#">CARD KEY ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a> )  (See <a href="#">STEERING LOCK UNIT ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a> )  (See <a href="#">KEYLESS CONTROL MODULE CONFIGURATION [ADVANCED KEYLESS SYSTEM]</a> )  (See <a href="#">IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]</a> )  (See <a href="#">SECURITY ACCESS PROCEDURE [ADVANCED KEYLESS SYSTEM]</a> )					

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DTC B1133 [ADVANCED KEYLESS SYSTEM]

DTC B1133	Keyless antenna (RF)
DETECTION CONDITION	Keyless antenna dose not operated.
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Keyless antenna (RF) malfunction</li><li>• Open or short circuit in wiring harness between keyless control module and keyless antenna</li><li>• Keyless control module malfunction</li></ul>
<div><div>KEYLESS ANTENNA HARNESS SIDE CONNECTOR</div></div> <div>KEYLESS CONTROL MODULE HARNESS SIDE CONNECTOR</div>	




Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT COMMUNICATION CIRCUIT FOR CONTINUITY</b> <ul style="list-style-type: none"><li>• Disconnect keyless control module connector and keyless antenna (RF) connector.</li><li>• Inspect the continuity between the following connector terminals.</li></ul>	<ul style="list-style-type: none"><li>• Replace keyless antenna (RF).  (See <a href="#">KEYLESS ANTENNA REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a>)</li><li>• Go to next step.</li></ul>
		<ul style="list-style-type: none"><li>• Repair the wiring harness between the keyless antenna (RF) and keyless</li></ul>

	<ul style="list-style-type: none"> <li>▪ keyless control module: 2A—keyless antenna: A</li> <li>▪ keyless control module: 2B—keyless antenna: B</li> </ul> <ul style="list-style-type: none"> <li>• Is there continuity?</li> </ul>		<p>control module.</p> <ul style="list-style-type: none"> <li>• Go to next step.</li> </ul>
2	<b>INSPECT KEYLESS CONTROL MODULE</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position.</li> <li>• Is the DTC displayed? <ul style="list-style-type: none"> <li>▪ M-MDS: B1133</li> </ul> </li> </ul>	<p>Yes</p> <p>Replace the keyless control module and perform the resetting procedure for the advanced keyless system when replacing the keyless control module.</p> <p>(See <a href="#">KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a>.)</p> <p>(See <a href="#">CARD KEY ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a>)</p> <p>(See <a href="#">STEERING LOCK UNIT ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a>)</p> <p>(See <a href="#">KEYLESS CONTROL MODULE CONFIGURATION [ADVANCED KEYLESS SYSTEM]</a>)</p> <p>(See <a href="#">IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</a>)</p> <p>(See <a href="#">SECURITY ACCESS PROCEDURE [ADVANCED KEYLESS SYSTEM]</a>)</p>	
		No DTC troubleshooting completed.	

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DTC B1132 [ADVANCED KEYLESS SYSTEM]

DTC B1132	Keyless antenna (LF)
DETECTION CONDITION	Keyless antenna dose not operated.
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Keyless antenna (LF) malfunction</li><li>• Open or short circuit in wiring harness between keyless control module and keyless antenna</li><li>• Keyless control module malfunction</li></ul>
<div><div>KEYLESS ANTENNA HARNESS SIDE CONNECTOR</div><div></div></div> <div><div>KEYLESS CONTROL MODULE HARNESS SIDE CONNECTOR</div><div></div><div></div></div>	




Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT COMMUNICATION CIRCUIT FOR CONTINUITY</b> <ul style="list-style-type: none"><li>• Disconnect keyless control module connector and keyless antenna (LF) connector.</li><li>• Inspect the continuity between the following connector terminals.</li></ul>	<ul style="list-style-type: none"><li>• Replace keyless antenna (LF.  (See <a href="#">KEYLESS ANTENNA REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a>.)</li><li>• Go to next step.</li></ul>
		<ul style="list-style-type: none"><li>• Repair the wiring harness between the keyless antenna (LF) and keyless</li></ul>

	<ul style="list-style-type: none"> <li>▪ keyless control module: 2C—keyless antenna: A</li> <li>▪ keyless control module: 2D—keyless antenna: B</li> </ul> <ul style="list-style-type: none"> <li>• Is there continuity?</li> </ul>		<p>control module.</p> <ul style="list-style-type: none"> <li>• Go to next step.</li> </ul>
2	<b>INSPECT KEYLESS CONTROL MODULE</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position.</li> <li>• Is the DTC displayed? <ul style="list-style-type: none"> <li>▪ M-MDS: B1132</li> </ul> </li> </ul>	<p>Yes</p> <p>Replace the keyless control module and perform the resetting procedure for the advanced keyless system when replacing the keyless control module.</p> <p>(See <a href="#">KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a>.)</p> <p>(See <a href="#">CARD KEY ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a>.)</p> <p>(See <a href="#">STEERING LOCK UNIT ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a>.)</p> <p>(See <a href="#">KEYLESS CONTROL MODULE CONFIGURATION [ADVANCED KEYLESS SYSTEM]</a>.)</p> <p>(See <a href="#">IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</a>.)</p> <p>(See <a href="#">SECURITY ACCESS PROCEDURE [ADVANCED KEYLESS SYSTEM]</a>.)</p>	
		No DTC troubleshooting completed.	

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DTC B1127 [ADVANCED KEYLESS SYSTEM]

DTC B1127	Keyless antenna (interior, trunk)
DETECTION CONDITION	Keyless antenna dose not operated.
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Keyless antenna (interior, trunk) malfunction</li><li>• Open or short circuit in wiring harness between keyless control module and keyless antenna</li><li>• Keyless control module malfunction</li></ul>
<div><div>KEYLESS ANTENNA HARNESS SIDE CONNECTOR</div><div></div></div> <div><div>KEYLESS CONTROL MODULE HARNESS SIDE CONNECTOR</div><div></div><div></div></div>	




Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT COMMUNICATION CIRCUIT FOR CONTINUITY</b> <ul style="list-style-type: none"><li>• Disconnect keyless control module connector and keyless antenna (interior, trunk) connector.</li><li>• Inspect the continuity between the following connector terminals.</li></ul>	<ul style="list-style-type: none"><li>• Replace keyless antenna (interior, trunk).  (See <b>KEYLESS ANTENNA REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</b>.)</li><li>• Go to next step.</li></ul>
		<ul style="list-style-type: none"><li>• Repair the wiring harness between the</li></ul>

	<ul style="list-style-type: none"> <li>▪ keyless control module: 2G—keyless antenna: A</li> <li>▪ keyless control module: 2H—keyless antenna: B</li> </ul> <ul style="list-style-type: none"> <li>• Is there continuity?</li> </ul>	<p>keyless antenna (interior, trunk) and keyless control module.</p> <ul style="list-style-type: none"> <li>• Go to next step.</li> </ul>
2	<p><b>INSPECT KEYLESS CONTROL MODULE</b></p> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position.</li> <li>• Is the DTC displayed? <ul style="list-style-type: none"> <li>▪ M-MDS: B1127</li> </ul> </li> </ul>	<p>Yes Replace the keyless control module and perform the resetting procedure for the advanced keyless system when replacing the keyless control module.</p> <p>(See <a href="#">KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a>.)</p> <p>(See <a href="#">CARD KEY ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a>.)</p> <p>(See <a href="#">STEERING LOCK UNIT ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a>.)</p> <p>(See <a href="#">KEYLESS CONTROL MODULE CONFIGURATION [ADVANCED KEYLESS SYSTEM]</a>.)</p> <p>(See <a href="#">IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</a>.)</p> <p>(See <a href="#">SECURITY ACCESS PROCEDURE [ADVANCED KEYLESS SYSTEM]</a>.)</p> <p>No DTC troubleshooting completed.</p>

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DTC B1128 [ADVANCED KEYLESS SYSTEM]

DTC B1128	Keyless antenna (interior, rear)
DETECTION CONDITION	Keyless antenna dose not operated.
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Keyless antenna (interior, rear) malfunction</li><li>• Open or short circuit in wiring harness between keyless control module and keyless antenna</li><li>• Keyless control module malfunction</li></ul>
<div><div>KEYLESS ANTENNA HARNESS SIDE CONNECTOR</div></div> <div><div>KEYLESS CONTROL MODULE HARNESS SIDE CONNECTOR</div></div>	

Diagnostic procedure


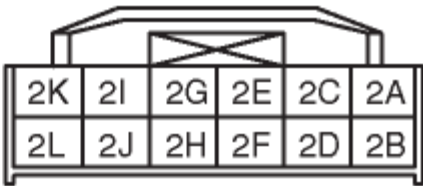
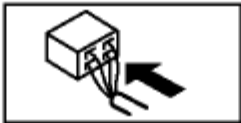
STEP	INSPECTION	ACTION
1	<div><b>INSPECT COMMUNICATION CIRCUIT FOR CONTINUITY</b><ul style="list-style-type: none"><li>• Disconnect keyless control module connector and keyless antenna (interior, rear) connector.</li><li>• Inspect the continuity between the following connector terminals.</li></ul></div>	<div><div>Yes</div><ul style="list-style-type: none"><li>• Replace keyless antenna (interior, rear).</li></ul><div>(See <b>KEYLESS ANTENNA REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</b>.)</div><ul style="list-style-type: none"><li>• Go to next step.</li></ul></div> <div><div>No</div><ul style="list-style-type: none"><li>• Repair the wiring harness between the</li></ul></div>

	<ul style="list-style-type: none"> <li>▪ keyless control module: 2I— keyless antenna: A</li> <li>▪ keyless control module: 2J— keyless antenna: B</li> </ul> <ul style="list-style-type: none"> <li>• Is there continuity?</li> </ul>		<p>keyless antenna (interior, rear) and keyless control module.</p> <ul style="list-style-type: none"> <li>• Go to next step.</li> </ul>
2	<b>INSPECT KEYLESS CONTROL MODULE</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position.</li> <li>• Is the DTC displayed? <ul style="list-style-type: none"> <li>▪ M-MDS: B1128</li> </ul> </li> </ul>	<p>Yes</p> <p>Replace the keyless control module and perform the resetting procedure for the advanced keyless system when replacing the keyless control module.</p> <p>(See <a href="#">KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a>.)</p> <p>(See <a href="#">CARD KEY ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a>.)</p> <p>(See <a href="#">STEERING LOCK UNIT ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a>.)</p> <p>(See <a href="#">KEYLESS CONTROL MODULE CONFIGURATION [ADVANCED KEYLESS SYSTEM]</a>.)</p> <p>(See <a href="#">IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</a>.)</p> <p>(See <a href="#">SECURITY ACCESS PROCEDURE [ADVANCED KEYLESS SYSTEM]</a>.)</p>	
		No DTC troubleshooting completed.	



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### DTC B1131 [ADVANCED KEYLESS SYSTEM]

DTC B1131	Keyless antenna (exterior, rear)
<b>DETECTION CONDITION</b>	Keyless antenna dose not operated.
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Keyless antenna (exterior, rear) malfunction</li> <li>• Open or short circuit in wiring harness between keyless control module and keyless antenna</li> <li>• Keyless control module malfunction</li> </ul>
<div> <div> <p>KEYLESS ANTENNA HARNESS SIDE CONNECTOR</p>  </div> <div> <p>KEYLESS CONTROL MODULE HARNESS SIDE CONNECTOR</p>  </div> <div>  </div> </div>	




### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<p><b>INSPECT COMMUNICATION CIRCUIT FOR CONTINUITY</b></p> <ul style="list-style-type: none"> <li>• Disconnect keyless control module connector and keyless antenna (exterior, rear) connector.</li> <li>• Inspect the continuity between the following connector terminals.</li> </ul>	<div>Yes</div> <ul style="list-style-type: none"> <li>• Replace keyless antenna (exterior, rear).</li> </ul> <p>(See <a href="#">KEYLESS ANTENNA REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> .)</p> <ul style="list-style-type: none"> <li>• Go to next step.</li> </ul> <div>No</div> <ul style="list-style-type: none"> <li>• Repair the wiring harness between the</li> </ul>

	<ul style="list-style-type: none"> <li>▪ keyless control module: 2E— keyless antenna: A</li> <li>▪ keyless control module: 2F— keyless antenna: B</li> </ul> <ul style="list-style-type: none"> <li>• Is there continuity?</li> </ul>		<p>keyless antenna (exterior, rear) and keyless control module.</p> <ul style="list-style-type: none"> <li>• Go to next step.</li> </ul>
2	<p><b>INSPECT KEYLESS CONTROL MODULE</b></p> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position.</li> <li>• Is the DTC displayed? <ul style="list-style-type: none"> <li>▪ M-MDS: B1131</li> </ul> </li> </ul>	<p>Yes</p> <p>Replace the keyless control module and perform the resetting procedure for the advanced keyless system when replacing the keyless control module.</p> <p>(See <a href="#">KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a>.)</p> <p>(See <a href="#">CARD KEY ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a>.)</p> <p>(See <a href="#">STEERING LOCK UNIT ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a>.)</p> <p>(See <a href="#">KEYLESS CONTROL MODULE CONFIGURATION [ADVANCED KEYLESS SYSTEM]</a>.)</p> <p>(See <a href="#">IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</a>.)</p> <p>(See <a href="#">SECURITY ACCESS PROCEDURE [ADVANCED KEYLESS SYSTEM]</a>.)</p>	
		No	DTC troubleshooting completed.

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DTC B1129 [ADVANCED KEYLESS SYSTEM]

DTC B1129	Keyless antenna (interior, middle)
DETECTION CONDITION	Keyless antenna dose not operated.
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Keyless antenna (interior, middle) malfunction</li><li>• Open or short circuit in wiring harness between keyless control module and keyless antenna</li><li>• Keyless control module malfunction</li></ul>
<div><div>KEYLESS ANTENNA HARNESS SIDE CONNECTOR</div><div></div></div> <div><div>KEYLESS CONTROL MODULE HARNESS SIDE CONNECTOR</div><div></div><div></div></div>	

Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT COMMUNICATION CIRCUIT FOR CONTINUITY</b> <ul style="list-style-type: none"><li>• Disconnect keyless control module connector and keyless antenna (interior, middle) connector.</li><li>• Inspect the continuity between the following connector terminals.</li></ul>	<ul style="list-style-type: none"><li>• Replace keyless antenna (interior, middle).  (See <a href="#">KEYLESS ANTENNA REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a>)</li><li>• Go to next step.</li></ul>
		<ul style="list-style-type: none"><li>• Repair the wiring harness between the</li></ul>

	<ul style="list-style-type: none"> <li>▪ keyless control module: 2K—keyless antenna: A</li> <li>▪ keyless control module: 2L—keyless antenna: B</li> </ul> <ul style="list-style-type: none"> <li>• Is there continuity?</li> </ul>	<p>keyless antenna (interior, middle) and keyless control module.</p> <ul style="list-style-type: none"> <li>• Go to next step.</li> </ul>
2	<b>INSPECT KEYLESS CONTROL MODULE</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position.</li> <li>• Is the DTC displayed? <ul style="list-style-type: none"> <li>▪ M-MDS: B1129</li> </ul> </li> </ul>	<p>Yes Replace the keyless control module and perform the resetting procedure for the advanced keyless system when replacing the keyless control module.</p> <p>(See <b>KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</b>.)</p> <p>(See <b>CARD KEY ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</b>)</p> <p>(See <b>STEERING LOCK UNIT ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</b>)</p> <p>(See <b>KEYLESS CONTROL MODULE CONFIGURATION [ADVANCED KEYLESS SYSTEM]</b>)</p> <p>(See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</b>)</p> <p>(See <b>SECURITY ACCESS PROCEDURE [ADVANCED KEYLESS SYSTEM]</b>)</p> <p>No DTC troubleshooting completed.</p>

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### DTC INSPECTION [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]

#### Security Light

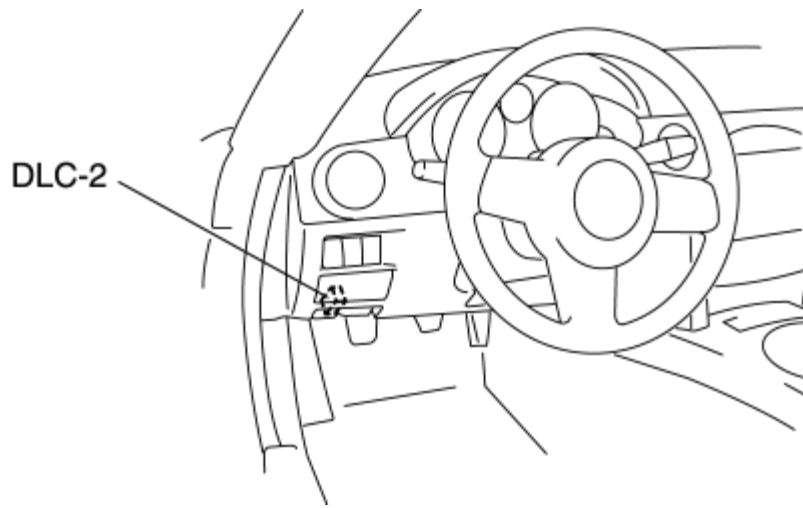
1. Turn the ignition switch to the ON position.
2. Verify the security light state.
  - If there is any malfunction:
    - After any malfunction is detected, the security light will function as follows **for approx. 1 min.**
      - DTC 16 and lower: Flashes
      - DTC 21 and higher: Illuminated
  - If there is no malfunction:
    - The security light illuminates **for approx. 3 s** and goes out.
3. When any malfunction has been detected, read DTCs via flashing patterns displayed after the security light flashes or is illuminated **for approx. 1 min.**
  - Perform troubleshooting according to the corresponding DTC inspection.

#### NOTE:

- A verified DTC is flashed 10 times repeatedly by the security light.
- If multiple DTCs are verified, the security light displays only the smallest DTC.

#### M-MDS

1. Connect the M-MDS to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  1. Select "Self Test".
  2. Select "Modules".
  3. Select "RKE".
- When using the PDS (Pocket PC)
  1. Select "Module Tests".
  2. Select "RKE".
  3. Select "Self Test".

3. Verify the DTC according to the directions on the screen.

- If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.

4. After completion of repairs, clear all DTCs stored in the keyless control module. (See **CLEARING DTC [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]**.)

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### FOREWORD [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]

- Malfunction diagnosis of the immobilizer system occurs automatically when the ignition switch is turned from the LOCK (ACC) to the ON (START) position.
- Results of the malfunction diagnosis can be verified from the DTCs. There are two methods of DTC verification: By the flashing pattern of the security light and by using the M-MDS.
- First, verify that the fuses are normal.
- The PID/data monitor function can be used to verify the number of key ID numbers registered for a single vehicle.

### CAUTION:

- Always use the M-MDS to verify DTCs even if the security light displays a DTC. If the security light itself has a malfunction, it is possible that a DTC may not be properly displayed. There are certain DTCs which can only be verified using the M-MDS, not the security light.
- DTCs for the immobilizer system that are stored in the keyless unit and PCM are cleared when the ignition switch is turned from the ON to the LOCK (ACC) position.
- If DTCs are not displayed even though the engine does not start or stalls, perform the following symptom troubleshooting:
  - **NO.3 WILL NOT CRANK [LF]**
- The following conditions may cause poor signal communication between the key and vehicle, resulting in the engine not starting or a key registration error. Do not perform any work under the following conditions:
  - If any of the following items are touching or near the key head.
    - Spare keys
    - Keys for other vehicles equipped with an immobilizer system
    - Any metallic object
    - Any electronic device, or any credit or other cards with magnetic strips

## EXAMPLES:



METAL RING LYING ON KEY HEAD



METAL PART OF ANOTHER  
KEY TOUCHING KEY HEAD



KEY IS NEAR OR TOUCHING  
ANOTHER IMMOBILIZER SYSTEM KEY

## NOTE:

- If two or more abnormalities are detected as a result of malfunction diagnosis, only the DTC with the lowest number of those detected will be displayed by the security light. However, multiple DTCs are stored at the same time.
- If two or more immobilizer system DTCs are verified, first repair the part indicated by the security light displayed DTC. After completely repairing one location, turn the ignition switch from the LOCK to the ON position and perform immobilizer system malfunction diagnosis.

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### PID/DATA MONITOR TABLE [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]

PID name (definition)	Detection condition
NUMKEY (Number of key ID numbers registered in the instrument cluster)	Number of key ID numbers registered: 0—8





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### DTC TABLE [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]

DTC						Detection condition	Page
Security light flashing pattern		Keyless warning light	M-MDS display*				
			Keyless control module	Instrument cluster	PCM		
11		Off	—	B1681	P1260	No communication detected between keyless control module and PCM	(See <b>SECURITY LIGHT 11, DTC - /B1681/P1260.</b> )
		On	B1681	B1681	P1260	No communication detected between coil antenna and instrument cluster	(See <b>SECURITY LIGHT 11, DTC B1681/B1681/P1260.</b> )
12		On	B2103	B2103	P1260	Coil antenna malfunction	(See <b>SECURITY LIGHT 12, DTC B2103/B2103/P1260.</b> )
13		Off	—	B1600	P1260	Key ID number cannot be read	(See <b>SECURITY LIGHT 13, DTC - /B1600/P1260.</b> )
		Off	—	B2431	P1260	Key ID number registration error	(See <b>SECURITY LIGHT 13, DTC - /B2431/P1260.</b> )
14		Off	—	B1602	P1260	Key ID number cannot be read	(See <b>SECURITY LIGHT 14, DTC - /B1602/P1260.</b> )

15		Off	–	B1601	P1260	Unprogrammed key ID number detected	(See <b>SECURITY LIGHT 15, DTC - /B1601/P1260.</b> )
		On	B1342	B1601	P1260	Keyless control module malfunction	(See <b>SECURITY LIGHT 15, DTC B1342/B1601/P1260.</b> )
16		Off	–	U2510	P1260	Communication error between instrument cluster and PCM (no response)	(See <b>SECURITY LIGHT 16, DTC - /U2510/P1260.</b> )
21		On	B1213	B1213	P1260	Only one key ID number is programmed to the instrument cluster	(See <b>SECURITY LIGHT 21, DTC B1213/B1213/P1260.</b> )
22		On	–	B2141	P1260	Communication error between instrument cluster and PCM (data transfer error)	(See <b>SECURITY LIGHT 22, DTC - /B2141/P1260.</b> )
23		On	–	B2139	P1260	ID number data i the PCM and instrument cluster do not match	(See <b>SECURITY LIGHT 23, DTC - /B2139/P1260.</b> )
Not illuminated		On	B1213	–	P1260	Only one key ID number is programmed to the keyless control module	(See <b>SECURITY LIGHT -, DTC B1213/- /P1260.</b> )
		On	U0073	–	–	CAN malfunction	(See <b>MULTIPLEX COMMUNICATION SYSTEM [MULTIPLEX COMMUNICATION SYSTEM] .</b> )
		Off	U0323 U0100 U2023	–	–	CAN malfunction	(See <b>MULTIPLEX COMMUNICATION SYSTEM [MULTIPLEX COMMUNICATION SYSTEM] .</b> )

\*

The letters at the beginning of each DTC are only displayed when using the M-MDS, and refer to the following: B= Body system, P= Powertrain system, U= Network communication system.

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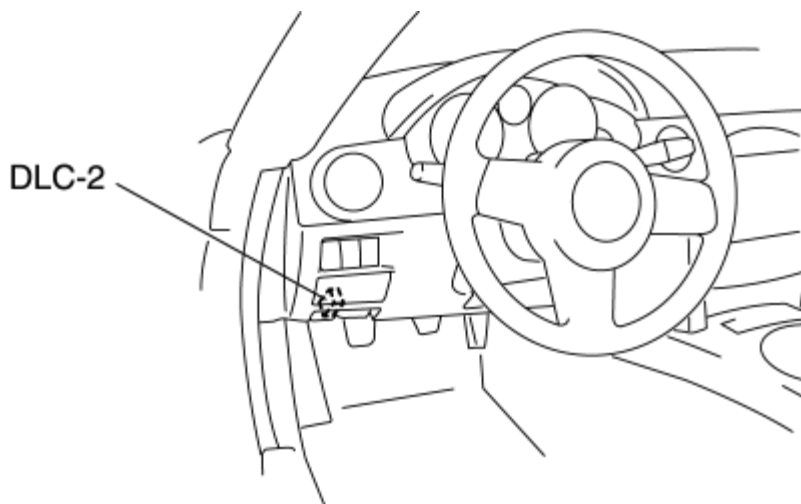
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### CLEARING DTC [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]

1. Connect the M-MDS to the DLC 2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

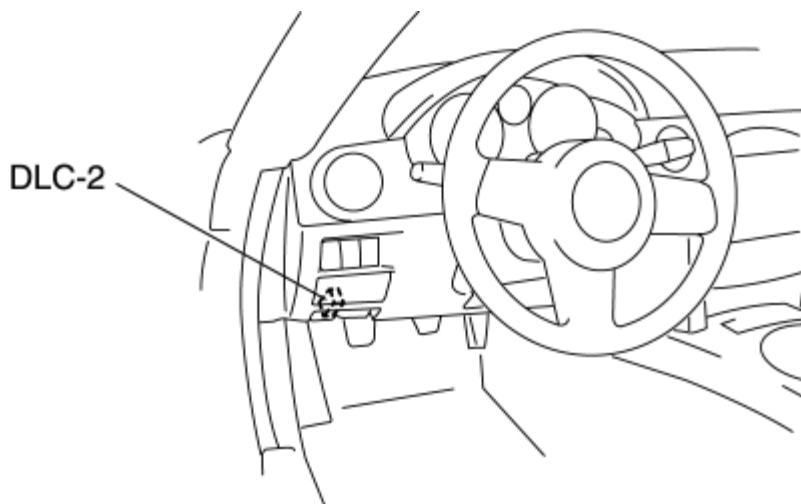
- When using the IDS (laptop PC)
  1. Select "Self Test".
  2. Select "Modules".
  3. Select "RKE".
- When using the PDS (Pocket PC)
  1. Select "Module Tests".
  2. Select "RKE".
  3. Select "Self Test".

3. Verify the DTC according to the directions on the screen.
4. Press the clear button on the DTC screen to clear the DTC.
5. Verify that no DTCs are displayed.

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### PID/DATA MONITOR INSPECTION [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]

1. Connect the M-MDS to the DLC 2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)

1. Select "DataLogger".
2. Select "Modules".
3. Select "RKE".

- When using the PDS (Pocket PC)

1. Select "Module Tests".
2. Select "RKE".
3. Select "DataLogger".

3. Select the applicable PID from the PID table.
4. Verify the PID data according to the directions on the screen.

#### NOTE:

- The PID data screen function is used for monitoring the calculated value of input/output signals in the module. Therefore, if the monitored value of the output parts is not within the specification, it is necessary to inspect the monitored value of input parts corresponding to the applicable output part control. In addition, because the system does not display an output part malfunction as an abnormality in the monitored value, it is necessary to inspect the output parts individually.



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SECURITY LIGHT -, DTC B1213/-/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]

DTC	Security light flashing pattern		-	Only one key ID number is registered
		Keyless control module	B1213	
	M-MDS display	Instrument cluster	-	
		PCM	P1260	
POSSIBLE CAUSE				<ul style="list-style-type: none"><li>Only one registered key</li></ul>

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	<b>VERIFY NUMBER OF REGISTERED KEYS</b> <ul style="list-style-type: none"><li>Using the M-MDS, perform the PID/data monitor inspection and confirm the number of registered keys.  (See <b>PID/DATA MONITOR TABLE [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]</b>.)</li><li>Are two or more keys registered?</li></ul>	Yes	Replace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the instrument cluster.  (See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION</b> .)  (See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</b> .)
		No	<ul style="list-style-type: none"><li>Using the M-MDS, clear the key ID number and register a new key if necessary.  (See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</b>.)</li><li>Go to the next step.</li></ul>



2	<b>VERIFY DTC</b> <ul style="list-style-type: none"><li>Using the registered key, turn the ignition switch to the ON position.</li><li>Is the DTC displayed again?<ul style="list-style-type: none"><li>Security light:<ul style="list-style-type: none"><li>-</li></ul></li><li>M-MDS:<ul style="list-style-type: none"><li>B1213/-</li><li>/P1260</li></ul></li></ul></li></ul>	Yes	Replace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the instrument cluster.  (See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION.</b> )  (See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM].</b> )
		No	DTC troubleshooting completed.

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SECURITY LIGHT 11, DTC -/B1681/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]

DTC	Security light flashing pattern		11	Communication error between the keyless control module and the instrument cluster
	M-MDS display	Keyless control module	-	
		Instrument cluster	B1681	
		PCM	P1260	
POSSIBLE CAUSE				<ul style="list-style-type: none"><li>Defective wiring harness</li><li>Defective instrument cluster</li></ul>

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>INSPECT COMMUNICATION CIRCUIT FOR CONTINUITY</b> <ul style="list-style-type: none"><li>Disconnect keyless control module and instrument cluster connectors.</li><li>Is there continuity between the following terminals?<ul style="list-style-type: none"><li>3A—2S</li><li>3C—2Q</li></ul></li></ul>	Yes	Replace keyless control module, then go to the next step.  (See <a href="#">KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> )
		No	Repair the wiring harness between the keyless control module and instrument cluster, then go to the next step.
2	<b>INSPECT KEYLESS CONTROL MODULE</b> <ul style="list-style-type: none"><li>Turn the ignition switch to the ON position.</li><li>Is the DTC displayed?<ul style="list-style-type: none"><li>Security light:</li></ul></li></ul>	Yes	Replace instrument cluster and reprogram immobilizer system.
		No	DTC troubleshooting completed.

- M-MDS: -  
/B1681/P1260

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### SECURITY LIGHT 11, DTC B1681/B1681/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]

DTC	Security light flashing pattern		11	Communication error between the keyless control module and the coil antenna
	M-MDS display	Keyless control module	B1681	
		Instrument cluster	B1681	
		PCM	P1260	
POSSIBLE CAUSE				<ul style="list-style-type: none"><li>Defective coil antenna</li><li>Defective keyless control module</li><li>Defective wiring harness</li></ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>INSPECT POWER SUPPLY CIRCUIT OF COIL ANTENNA</b> <ul style="list-style-type: none"> <li>Disconnect coil antenna connector.</li> <li>Turn ignition switch to ON position.</li> <li>Measure voltage at terminal D of coil antenna connector.</li> <li>Is voltage <b>more than 8 V</b>?</li> </ul>	Yes	Go to next step.
		No	Repair wiring harness.
2	<b>INSPECT WIRING HARNESS BETWEEN COIL ANTENNA AND GROUND</b> <ul style="list-style-type: none"> <li>Turn ignition switch to LOCK position.</li> <li>Inspect wiring harness between coil antenna terminal C and ground for following.</li> </ul>	Yes	Go to next step.
		No	Repair wiring harness.

	<ul style="list-style-type: none"> <li>▪ Short to power supply</li> <li>▪ Open circuit</li> </ul> <ul style="list-style-type: none"> <li>• Is wiring harness okay?</li> </ul>		
3	<b>INSPECT COIL ANTENNA INPUT SIGNAL CIRCUIT</b> <ul style="list-style-type: none"> <li>• Connect coil antenna connector.</li> <li>• Turn ignition switch to ON position.</li> <li>• Is there continuity between the following terminals? <ul style="list-style-type: none"> <li>▪ 2Y—B</li> <li>▪ 2AA—A</li> </ul> </li> </ul>	Yes	Replace coil antenna, then go to the next step.  (See <b>COIL ANTENNA REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</b> )
		No	Repair wiring harness.
4	<b>INSPECT KEYLESS CONTROL MODULE</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position.</li> <li>• Is the DTC displayed? <ul style="list-style-type: none"> <li>▪ Security light: 11</li> <li>▪ M-MDS: B1681/B1681/P1260</li> </ul> </li> </ul>	Yes	Replace keyless control module, then go to the next step.  (See <b>KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</b> )
		No	DTC troubleshooting completed.

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### SECURITY LIGHT 12, DTC B2103/B2103/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]

DTC	Security light flashing pattern		12	Coil Antenna failure
	M-MDS display	Keyless control module	B2103	
		Instrument cluster	B2103	
		PCM	P1260	
POSSIBLE CAUSE				<ul style="list-style-type: none"><li>• Defective coil antenna</li><li>• Poor connection of coil antenna connector</li><li>• Defective keyless control module</li></ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>INSPECT CONNECTOR CONNECTION</b> <ul style="list-style-type: none"> <li>Is connector of coil antenna and keyless control module connected securely?</li> </ul>	Yes	Replace coil antenna.  (See <b>COIL ANTENNA REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</b> )
		No	Connect connector securely.
2	<b>INSPECT KEYLESS CONTROL MODULE</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position.</li> <li>Is the DTC displayed? <ul style="list-style-type: none"> <li>Security light: 12</li> <li>M-MDS: B2103/B2103/P1260</li> </ul> </li> </ul>	Yes	Replace instrument cluster.  (See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION</b> )
		No	DTC troubleshooting completed.

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### SECURITY LIGHT 13, DTC -/B1600/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]

DTC	Security light flashing pattern		13	ID number is not received
	M-MDS display	Keyless control module	-	
		Instrument cluster	B1600	
		PCM	P1260	
POSSIBLE CAUSE				<ul style="list-style-type: none"><li>• No transponder in the key</li><li>• Defective transponder in the key (ID number is not output.)</li><li>• Defective coil antenna</li><li>• Defective instrument cluster</li></ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY DTC USING M-MDS</b> <ul style="list-style-type: none"> <li>Does M-MDS indicate DTC B1600?</li> </ul>	Yes Go to Step 3.
		No Go to next step.
2	<b>VERIFY DTC USING M-MDS</b> <ul style="list-style-type: none"> <li>Does M-MDS indicate DTC B2431?</li> </ul>	Yes Go to SECURITY LIGHT 13, DTC - /B2431/P1260.  (See <a href="#">SECURITY LIGHT 13, DTC -/B2431/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]</a> .)
		No Go to next step.
3	<b>VERIFY VALID KEY</b> <ul style="list-style-type: none"> <li>Is there any key, other than the</li> </ul>	Yes Go to Step 5.



	one that caused displayed DTC, which can start the engine?	No	Go to next step.
4	<b>VERIFY WHETHER MALFUNCTION IS IN COIL ANTENNA OR KEY</b> <ul style="list-style-type: none"> <li>Using <b>M-MDS</b> register an additional key.</li> </ul> <p>(See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</b>)</p> <ul style="list-style-type: none"> <li>Using registered key, turn ignition switch to ON position.</li> <li>Does M-MDS indicate DTC - /B1600/P1260 again?</li> </ul>	Yes	Replace coil antenna, then go to step 6.  (See <b>COIL ANTENNA REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</b> )
		No	<ul style="list-style-type: none"> <li>Dispose of defective key.</li> <li>Duplicate key if necessary.</li> </ul> <p>(See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</b>)</p>
5	<b>VERIFY WHETHER MALFUNCTION IS IN COIL ANTENNA OR KEY</b> <ul style="list-style-type: none"> <li>Using any other valid key, turn ignition switch to ON position.</li> <li>Does M-MDS indicate DTC - /B1600/P1260 again?</li> </ul>	Yes	Replace coil antenna, then go to next step.  (See <b>COIL ANTENNA REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</b> )
		No	<ul style="list-style-type: none"> <li>Dispose of defective key.</li> <li>Duplicate key if necessary.</li> </ul> <p>(See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</b>)</p>
6	<b>INSPECT KEYLESS CONTROL MODULE</b> <ul style="list-style-type: none"> <li>Using registered key, turn ignition switch to ON position.</li> <li>Does M-MDS indicate DTC - /B1600/P1260 again?</li> </ul>	Yes	Replace keyless control module, then go to next step.  (See <b>KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</b> )
		No	DTC troubleshooting completed.
7	<b>INSPECT INSTRUMENT CLUSTER</b> <ul style="list-style-type: none"> <li>Using registered key, turn ignition switch to ON position.</li> <li>Does M-MDS indicate DTC - /B1600/P1260 again?</li> </ul>	Yes	Replace instrument cluster and reprogram immobilizer system.  (See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</b> )
		No	DTC troubleshooting completed.



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### SECURITY LIGHT 13, DTC -/B2431/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]

DTC	Security light flashing pattern		13	ID number signal is not received
	M-MDS display	Keyless control module	-	
		Instrument cluster	B2431	
		PCM	P1260	
POSSIBLE CAUSE				<ul style="list-style-type: none"><li>• The procedure fails to program the transponder into PCM</li><li>• Any of the following items are touching or near the key head.<ul style="list-style-type: none"><li>▪ Spare keys</li><li>▪ Keys for other vehicles equipped with an immobilizer system</li><li>▪ Any metallic object</li><li>▪ Any electronic device, or any credit or other cards with magnetic strips</li></ul></li></ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY DTC USING M-MDS</b>	
	<ul style="list-style-type: none"> <li>Does M-MDS indicate DTC B2431?</li> </ul>	<div>Yes</div> Go to Step 3.
		<div>No</div> Go to next step.
2	<b>VERIFY DTC USING M-MDS</b>	
	<ul style="list-style-type: none"> <li>Does M-MDS indicate DTC B1600?</li> </ul>	<div>Yes</div> Go to SECURITY LIGHT 13, DTC -/B1600/P1260.

			(See <a href="#">SECURITY LIGHT 13, DTC - /B1600/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]</a> .)
		No	Go to next step.
3	<b>INSPECT KEYLESS CONTROL MODULE</b> <ul style="list-style-type: none"><li>Erase key ID number using <b>M-MDS</b> and register key ID number.  (See <a href="#">IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</a>)</li><li>Using registered key, turn ignition switch to ON position.</li><li>Does M-MDS indicate DTC - /B2431/P1260 again?</li></ul>	Yes	Replace keyless control module, then go to the next step.  (See <a href="#">KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> )
		No	DTC troubleshooting completed.
4	<b>INSPECT INSTRUMENT CLUSTER</b> <ul style="list-style-type: none"><li>Using registered key, turn ignition switch to ON position.</li><li>Does M-MDS indicate DTC - /B2431/P1260 again?</li></ul>	Yes	Replace instrument cluster and reprogram immobilizer system.
		No	DTC troubleshooting completed.

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### SECURITY LIGHT 14, DTC -/B1602/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]

DTC	Security light flashing pattern		14	PCM received invalid format of ID number from transponder
	M-MDS display	Keyless control module	-	
		Instrument cluster	B1602	
		PCM	P1260	
POSSIBLE CAUSE				<ul style="list-style-type: none"><li>• Defective transponder in the key</li><li>• Defective coil antenna</li><li>• Defective PCM</li><li>• Defective keyless control module</li><li>• Any of the following items are touching or near the key head.<ul style="list-style-type: none"><li>▪ Spare keys</li><li>▪ Keys for other vehicles equipped with an immobilizer system</li><li>▪ Any metallic object</li><li>▪ Any electronic device, or any credit or other cards with magnetic strips</li></ul></li></ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT FOR OTHER PROPER KEYS</b> <ul style="list-style-type: none"> <li>Using any other valid key, turn ignition switch to ON position.</li> </ul>	Yes Replace coil antenna, then go to next step. (See <a href="#">COIL ANTENNA REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> )

	<ul style="list-style-type: none"><li>If there are no other valid keys, then register an additional key using M-MDS and turn ignition switch to ON position.</li></ul> <p>(See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</b>)</p> <ul style="list-style-type: none"><li>Does M-MDS indicate DTC - /B1602 again?</li></ul>		)
		No	<ul style="list-style-type: none"><li>Dispose of defective key.</li><li>Duplicate key if necessary.</li></ul> <p>(See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</b>)</p>
2	<b>INSPECT KEYLESS CONTROL MODULE</b> <ul style="list-style-type: none"><li>Turn the ignition switch to the ON position.</li><li>Is the DTC displayed?<ul style="list-style-type: none"><li>Security light: 14</li><li>M-MDS: - /B1602/P1260</li></ul></li></ul>	Yes	Replace keyless control module, then go to the next step.  (See <b>KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</b> )
		No	DTC troubleshooting completed.

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### SECURITY LIGHT 15, DTC -/B1601/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]

DTC	Security light flashing pattern		15	PCM received incorrect ID number from key (transponder)
	M-MDS display	Keyless control module	-	
		Instrument cluster	B1601	
		PCM	P1260	
POSSIBLE CAUSE				<ul style="list-style-type: none"><li>• No keys have been registered after installation of new instrument cluster</li><li>• Unregistered key detected</li><li>• Attempt made to register a ninth key</li></ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"><li>• A maximum of only eight keys can be registered for a single vehicle.</li><li>• Defective keyless control module</li><li>• Defective instrument cluster</li></ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY REGISTERED KEY IN PCM</b> <ul style="list-style-type: none"> <li>Check following PID/DATA monitor using M-MDS. <ul style="list-style-type: none"> <li>NUMKEYS</li> </ul> </li> <li>Is NUMKEYS displayed more than 2?</li> </ul>	Yes Go to next step.
		No Go to Step 3.

2	<b>VERIFY REGISTERED KEY IN PCM</b> <ul style="list-style-type: none"> <li>Check following PID/DATA monitor using M-MDS. <ul style="list-style-type: none"> <li>NUMKEYS</li> </ul> </li> <li>Is NUMKEYS displayed more than 8?</li> </ul>	Yes	<ul style="list-style-type: none"> <li>Erase key ID number using <b>M-MDS</b> and register key ID number.</li> </ul> <p>(See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</b>)</p> <ul style="list-style-type: none"> <li>Go to next step.</li> </ul>
		No	Go to next step.
3	<b>VERIFY WHETHER MALFUNCTION IS IN COIL ANTENNA OR KEY</b> <ul style="list-style-type: none"> <li>Using <b>M-MDS</b> register an additional key.</li> </ul> <p>(See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</b>)</p> <ul style="list-style-type: none"> <li>Using registered key, turn ignition switch to ON position.</li> <li>Does M-MDS indicate DTC - /B1601/P1260 again?</li> </ul>	Yes	Replace keyless control module, then go to the next step. <p>(See <b>KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</b>)</p>
		No	DTC troubleshooting completed.
4	<b>INSPECT INSTRUMENT CLUSTER</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position.</li> <li>Is the DTC displayed? <ul style="list-style-type: none"> <li>Security light: 15</li> <li>M-MDS: - /B1601/P1260</li> </ul> </li> </ul>	Yes	Replace instrument cluster and reprogram immobilizer system. <p>(See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</b>)</p>
		No	DTC troubleshooting completed.



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### SECURITY LIGHT 15, DTC B1342/B1601/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]

DTC	Security light flashing pattern		15	Keyless control module malfunction
		Keyless control module	B1342	
	M-MDS display	Instrument cluster	B1601	
		PCM	P1260	
POSSIBLE CAUSE				<ul style="list-style-type: none"> <li>Defective keyless control module</li> </ul>

### Diagnostic procedure

STEP	INSPECTION		ACTION
1	<b>INSPECT KEYLESS CONTROL MODULE</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position.</li> <li>Is the DTC displayed? <ul style="list-style-type: none"> <li>Security light: 15</li> <li>M-MDS: B1342/B1601/P1260</li> </ul> </li> </ul>		Yes Replace keyless control module. (See <a href="#">KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> .)
			No DTC troubleshooting completed.

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SECURITY LIGHT 16, DTC -/U2510/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]

DTC	Security light flashing pattern		16	Communication error between the instrument cluster and the PCM (no response)
	M-MDS display	Keyless control module	-	
		Instrument cluster	U2510	
		PCM	P1260	
POSSIBLE CAUSE				<ul style="list-style-type: none"><li>• Malfunction in the wiring harness (CAN line) between the instrument cluster and the PCM</li><li>• PCM malfunction</li><li>• Instrument cluster malfunction</li></ul>

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	<b>VERIFY DTC</b> <ul style="list-style-type: none"><li>• Are either U1900 or U0073, or both, displayed, by either the instrument cluster or the PCM, or both?</li></ul>		YesPerform troubleshooting according to the corresponding DTC inspection.  (See <b>DTC U0073, U2516 [MULTIPLEX COMMUNICATION SYSTEM]</b> .)
			NoReplace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the instrument cluster.  (See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION.</b> )

			(See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</b> .)  Go to the next step.
2	<b>VERIFY DTC</b> <ul style="list-style-type: none"><li>Using the registered key, turn the ignition switch to the ON position.</li><li>Is the DTC displayed?<ul style="list-style-type: none"><li>Security light: 16</li><li>M-MDS: - /U2510/P1260</li></ul></li></ul>	Yes	Replace the PCM and perform the resetting procedure for the immobilizer system when replacing the PCM.  (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)  (See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</b> .)
		No	DTC troubleshooting completed.

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### SECURITY LIGHT 21, DTC B1213/B1213/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]

DTC	Security light flashing pattern		21	Number of valid keys is below minimum
		Keyless control module	B1213	
	M-MDS display	Instrument cluster	B1213	
		PCM	P1260	
POSSIBLE CAUSE				<ul style="list-style-type: none"> <li>Less than two valid keys</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>VERIFY NUMBER OF VALID KEYS</b> <ul style="list-style-type: none"> <li>Check following PID/DATA monitor with M-MDS. <ul style="list-style-type: none"> <li>NUMKEYS</li> </ul> </li> <li>Is NUMKEYS displayed more than 2?</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>To start the engine, two or more keys need to be registered.</li> </ul>	Yes	Replace instrument cluster and reprogram immobilizer system.  (See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION</b> )
		No	<ul style="list-style-type: none"> <li>Erase key ID numbers and register necessary key ID numbers.</li> <li>Go to next step.</li> </ul>
2	<b>INSPECT KEYLESS CONTROL MODULE</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position.</li> <li>Is the DTC displayed? <ul style="list-style-type: none"> <li>Security light: 21</li> <li>M-MDS: B1213/B1213/P1260</li> </ul> </li> </ul>	Yes	Replace instrument cluster and reprogram immobilizer system.  (See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</b> .)
		No	DTC troubleshooting completed.



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### SECURITY LIGHT 22, DTC -/B2141/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]

DTC	Security light flashing pattern		22	Communication error between the instrument cluster and the PCM (data transfer error)
	M-MDS display	Keyless control module	-	
		Instrument cluster	B2141	
		PCM	P1260	
POSSIBLE CAUSE				<ul style="list-style-type: none"><li>• Malfunction in the wiring harness (CAN line) between the instrument cluster and the PCM</li><li>• Instrument cluster malfunction</li><li>• PCM malfunction</li></ul>

### Diagnostic Procedure

STEP	INSPECTION		ACTION
1	<b>VERIFY DTC</b> <ul style="list-style-type: none"> <li>• Are either U1900 or U0073, or both displayed, by either the instrument cluster or the PCM, or both?</li> </ul>	Yes	Perform troubleshooting according to the corresponding DTC inspection.  (See <b>DTC U0073, U2516 [MULTIPLEX COMMUNICATION SYSTEM]</b> .)
		No	Go to the next step.
2	<b>VERIFY DTC</b> <ul style="list-style-type: none"> <li>• Using the registered key, turn the ignition switch to the ON</li> </ul>	Yes	<ul style="list-style-type: none"> <li>• Replace the PCM and perform the resetting procedure for the immobilizer system when replacing the PCM.</li> </ul>

	position. • Is the DTC displayed? <ul style="list-style-type: none"> <li>Security light: 22</li> <li>M-MDS: - /B2141/P1260</li> </ul>		(See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</b> .) • Go to the next step.
		No DTC troubleshooting completed.	
3	<b>EXAMINE INSTRUMENT CLUSTER AND PCM</b> • Is the DTC displayed again? <ul style="list-style-type: none"> <li>Security light: 22</li> <li>M-MDS: - /B2141/P1260</li> </ul>	Yes	• Replace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the instrument cluster.  (See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION</b> .)  (See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</b> .) • Go to the next step.
		No DTC troubleshooting completed.	
4	<b>EXAMINE PCM</b> • Is the DTC displayed again? <ul style="list-style-type: none"> <li>Security light: 22</li> <li>M-MDS: - /B2141/P1260</li> </ul>	Yes	• Replace the PCM and perform the resetting procedure for the immobilizer system when replacing the PCM.  (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)  (See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</b> .)
		No DTC troubleshooting completed.	

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### SECURITY LIGHT 23, DTC -/B2139/P1260 [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]

DTC	Security light flashing pattern		23	ID number data in the PCM and the instrument cluster do not match
	M-MDS display	Keyless control module	-	
		Instrument cluster	B2139	
		PCM	P1260	
POSSIBLE CAUSE				<ul style="list-style-type: none"><li>• Necessary procedures were not performed using the M-MDS after replacing the PCM.</li><li>• Instrument cluster malfunction</li><li>• PCM malfunction</li></ul>

### Diagnostic Procedure

STEP	INSPECTION		ACTION
1	<b>VERIFY DTC</b> <ul style="list-style-type: none"> <li>Are either U1900 or U0073, or both, displayed, by either the instrument cluster or the PCM, or both?</li> </ul>	Yes	Perform troubleshooting according to the corresponding DTC inspection.  (See <b>DTC U0073, U2516 [MULTIPLEX COMMUNICATION SYSTEM]</b> .)
		No	Go to the next step.
2	<b>VERIFY THAT KEY IS PROGRAMMED TO PCM</b> <ul style="list-style-type: none"> <li>Perform procedures for when</li> </ul>	Yes	Go to the next step.
		No	DTC troubleshooting completed.



	<p>replacing the PCM.</p> <p>(See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</b>.)</p> <ul style="list-style-type: none"><li>• Using the registered key, turn the ignition switch to the ON position.</li><li>• Is the DTC displayed?<ul style="list-style-type: none"><li>▪ Security light: 23</li><li>▪ M-MDS: - /B2139/P1260</li></ul></li></ul>		
3	<p><b>VERIFY THAT KEY IS PROGRAMMED TO INSTRUMENT CLUSTER</b></p> <ul style="list-style-type: none"><li>• Perform procedures for when replacing the instrument cluster.</li></ul> <p>(See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</b>.)</p> <ul style="list-style-type: none"><li>• Using the registered key, turn the ignition switch to the ON position.</li><li>• Is the DTC displayed?<ul style="list-style-type: none"><li>▪ Security light: 23</li><li>▪ M-MDS: - /B2139/P1260</li></ul></li></ul>	Yes	<ul style="list-style-type: none"><li>• Replace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the instrument cluster.</li></ul> <p>(See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION</b>.)</p> <p>(See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</b>.)</p> <ul style="list-style-type: none"><li>• Go to the next step.</li></ul>
		No	<p>DTC troubleshooting completed.</p>
4	<p><b>VERIFY DTC</b></p> <ul style="list-style-type: none"><li>• Is the DTC displayed again?<ul style="list-style-type: none"><li>▪ Security light: 23</li><li>▪ M-MDS: - /B2139/P1260</li></ul></li></ul>	Yes	<ul style="list-style-type: none"><li>• Replace the PCM and perform the resetting procedure for the immobilizer system when replacing the PCM.</li></ul> <p>(See <b>PCM REMOVAL/INSTALLATION [LF]</b>.)</p> <p>(See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</b>.)</p>

	No DTC troubleshooting completed.
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## 2008 - MX-5 - Body and Accessories

### DTC INSPECTION [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]

#### Security Light

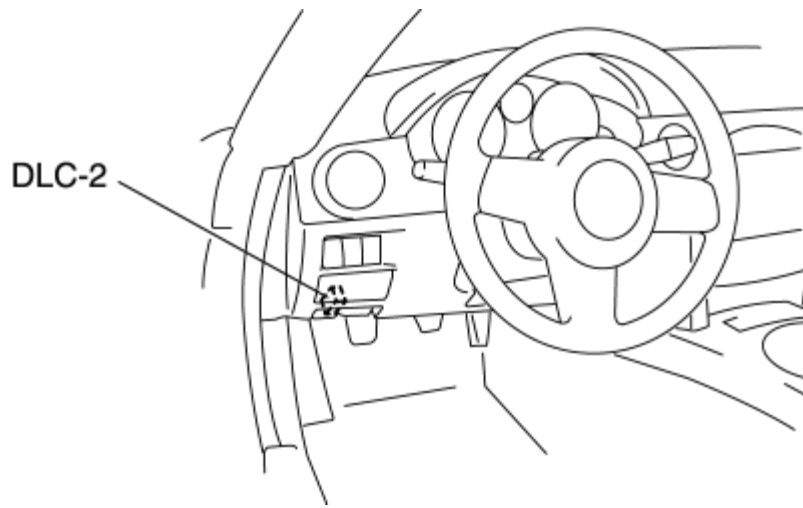
1. Turn the ignition switch to the ON position.
2. Verify the security light state.
  - If there is any malfunction:
    - After any malfunction is detected, the security light will function as follows **for approx. 1 min.**
      - DTC 16 and lower: Flashes
      - DTC 21 and higher: Illuminated
  - If there is no malfunction:
    - The security light illuminates **for approx. 3 s** and goes out.
3. When any malfunction has been detected, read DTCs via flashing patterns displayed after the security light flashes or is illuminated **for approx. 1 min.**
  - Perform troubleshooting according to the corresponding DTC inspection.

#### NOTE:

- A verified DTC is flashed 10 times repeatedly by the security light.
- If multiple DTCs are verified, the security light displays only the smallest DTC.

#### M-MDS

1. Connect the M-MDS to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  1. Select "Self Test".
  2. Select "Modules".
  3. Select "IC".
- When using the PDS (Pocket PC)
  1. Select "Module Tests".
  2. Select "IC".
  3. Select "Self Test".

3. Verify the DTC according to the directions on the screen.

- If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.

4. After completion of repairs, clear all DTCs stored in the IC. (See **DTC TABLE [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]**)

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## 2008 - MX-5 - Body and Accessories

### FOREWORD [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]

- Malfunction diagnosis occurs automatically when the ignition switch is turned from the LOCK (ACC) to the ON (START) position.
- If the results of the malfunction diagnosis show a malfunction, the security light displays a DTC and the PCM stores the DTC. DTCs stored in the PCM can be verified using the M-MDS.
- DTCs for the immobilizer system that are stored in the PCM are cleared when the ignition switch is turned from the ON to the LOCK (ACC) position.
- There are certain DTCs which can only be verified using the M-MDS, not the security light.
- The PID/data monitor function can be used to verify the number of keys registered for a single vehicle.
- If DTCs are not displayed even though the engine does not start, perform the following symptom troubleshooting:
  - **NO.3 WILL NOT CRANK [LF]**

### CAUTION:

- Always use the M-MDS to verify DTCs even if the DTCs are verified by the security light display. If the security light has a malfunction, it is possible that a DTC may not be properly displayed.
- Always use the M-MDS to verify DTCs because there are certain DTCs which cannot be verified using the security light.
- If any of the following items are touching or near the key head, signal communication between the key and vehicle is negatively affected, resulting in the engine not starting. Do not start the engine if any of the following items are touching or near the key head.
  - Any metallic object
  - Spare keys or keys for other vehicles equipped with an immobilizer system
  - Any electronic device, or any credit or other cards with magnetic strips

## EXAMPLES:



METAL RING LYING ON KEY HEAD



METAL PART OF ANOTHER  
KEY TOUCHING KEY HEAD



KEY IS NEAR OR TOUCHING  
ANOTHER IMMOBILIZER SYSTEM KEY

## NOTE:

- If multiple DTCs are detected as a result of malfunction diagnosis, only the DTC with the lowest number of those detected will be displayed by the security light. The PCM stores multiple DTCs at the same time.
- If two or more immobilizer system DTCs are verified, first repair the part indicated by the security light displayed DTC. After repairing one location, turn the ignition switch from the LOCK to the ON position and perform an immobilizer system malfunction diagnosis.

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### PID/DATA MONITOR TABLE [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]

PID name (definition)	Detection condition
IC_NUMKEYS (Number of key ID numbers registered in the instrument cluster)	Number of key ID numbers registered: 0—8




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DTC TABLE [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]

DTC				Detection condition	Page	
Security light flashing pattern		M-MDS display*				
		Instrument cluster	PCM			
11			B1681	P1260	No detected communication with the coil antenna	SECURITY LIGHT 11, DTC B1681/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]
12			B2103	P1260	<ul style="list-style-type: none"><li>Coil antenna malfunction</li><li>The PCM determined a malfunction in the coil antenna even though it is normal.</li></ul>	SECURITY LIGHT 12, DTC B2103/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]
13			B1600	P1260	The key ID number data cannot be read.	SECURITY LIGHT 13, DTC B1600/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]
			B2431	P1260	Key ID number registration error	SECURITY LIGHT 13, DTC B2431/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]
						SECURITY LIGHT 14,



14		B1602	P1260	The instrument cluster cannot read key ID number data normally.	<b>DTC B1602/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]</b>
15		B1601	P1260	The instrument cluster has detected unregistered key ID number.	<b>SECURITY LIGHT 15, DTC B1601/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]</b>
16		U2510	P1260	Communication error between the instrument cluster and the PCM (no response)	<b>SECURITY LIGHT 16, DTC U2510/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]</b>
21		B1213	P1260	Only one key ID number is registered.	<b>SECURITY LIGHT 21, DTC B1213/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]</b>
22		B2141	P1260	Communication error between the instrument cluster and the PCM (data transfer error)	<b>SECURITY LIGHT 22, DTC B2141/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]</b>
23		B2139	P1260	ID number data in the PCM and the instrument cluster do not match.	<b>SECURITY LIGHT 23, DTC B2139/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]</b>
Not illuminated		B1342	-	Instrument cluster malfunction	<b>DTC B1342 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]</b>

\*

The letters at the beginning of each DTC are only displayed when using the M-MDS, and refer to the following: B= Body system, P= Powertrain system, U= Network communication system.

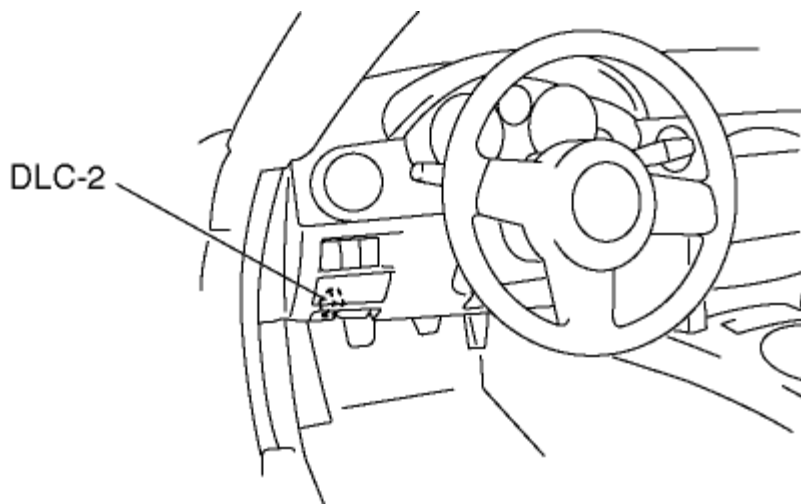
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## 2008 - MX-5 - Body and Accessories

### CLEARING DTC [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]

1. Connect the M-MDS to the DLC 2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

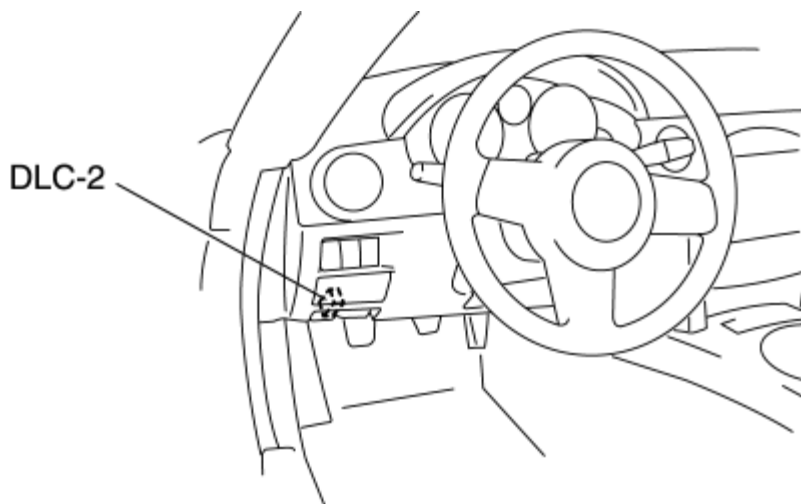
- When using the IDS (laptop PC)
  1. Select "Self Test".
  2. Select "Modules".
  3. Select "IC".
- When using the PDS (Pocket PC)
  1. Select "Module Tests".
  2. Select "IC".
  3. Select "Self Test".

3. Verify the DTC according to the directions on the screen.
4. Press the clear button on the DTC screen to clear the DTC.
5. Verify that no DTCs are displayed.

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### PID/DATA MONITOR INSPECTION [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]

1. Connect the M-MDS to the DLC 2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  1. Select "DataLogger".
  2. Select "Modules".
  3. Select "IC".
- When using the PDS (Pocket PC)
  1. Select "Module Tests".
  2. Select "IC".
  3. Select "DataLogger".

3. Select the applicable PID from the PID table.
4. Verify the PID data according to the directions on the screen.

#### NOTE:

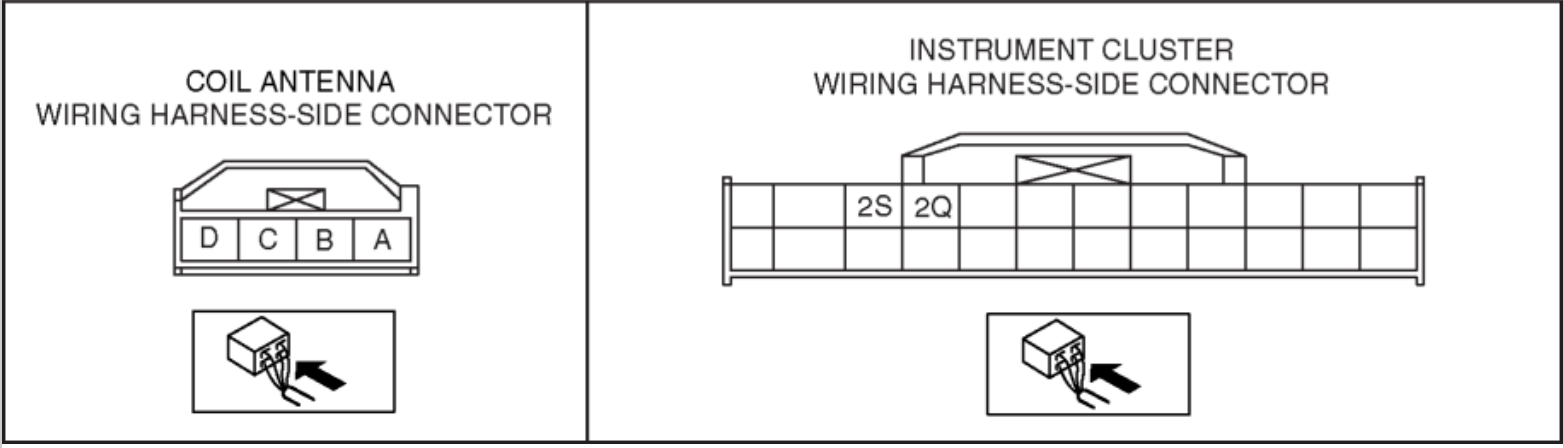
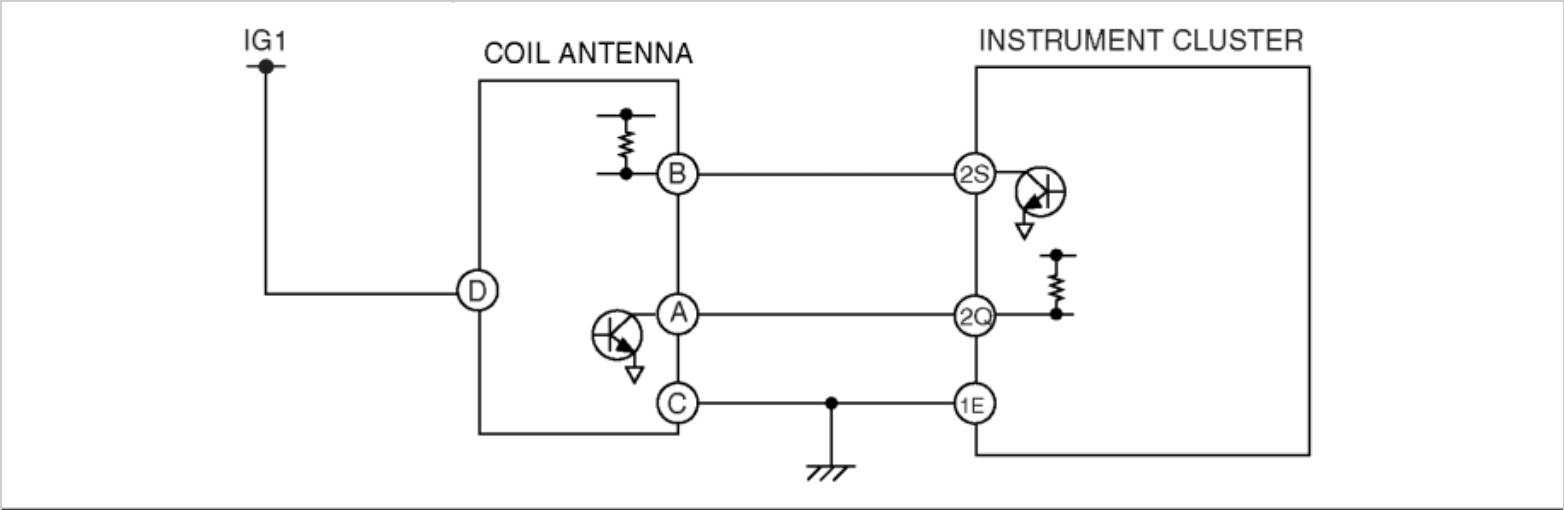
- The PID data screen function is used for monitoring the calculated value of input/output signals in the module. Therefore, if the monitored value of the output parts is not within the specification, it is necessary to inspect the monitored value of input parts corresponding to the applicable output part control. In addition, because the system does not display an output part malfunction as an abnormality in the monitored value, it is necessary to inspect the output parts individually.



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SECURITY LIGHT 11, DTC B1681/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]

SECURITY LIGHT: 11	No detected communication with the coil antenna
DTC: B1681/P1260	
DETECTION CONDITION	<ul style="list-style-type: none"><li>No detected communication with the coil antenna</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Coil antenna malfunction</li><li>Instrument cluster malfunction</li><li>Malfunction in the related wiring harnesses</li></ul>



Diagnostic Procedure

STEP	INSPECTION	ACTION	
1	<b>INSPECT COIL ANTENNA POWER SUPPLY SYSTEM</b> <ul style="list-style-type: none"> <li>• Disconnect the coil antenna connector.</li> <li>• Turn the ignition switch to the ON position.</li> <li>• Measure the voltage at coil antenna terminal D. <ul style="list-style-type: none"> <li>▪ Is the voltage <b>8 V or more?</b></li> </ul> </li> </ul>	Yes	Go to the next step.
		No	Repair the wiring harness.
2	<b>INSPECT WIRING HARNESS BETWEEN COIL ANTENNA AND GROUND</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Inspect the wiring harness between coil antenna terminal C and ground for the following: <ul style="list-style-type: none"> <li>▪ Short to power supply</li> <li>▪ Open circuit</li> </ul> </li> <li>• Is the wiring harness normal?</li> </ul>	Yes	Go to the next step.
		No	Repair the wiring harness.
3	<b>INSPECT COIL ANTENNA INPUT SIGNAL CIRCUIT</b> <ul style="list-style-type: none"> <li>• Connect the coil antenna connector.</li> <li>• Turn the ignition switch to the ON position.</li> <li>• Measure the voltage at coil antenna terminal B. <ul style="list-style-type: none"> <li>▪ Is the voltage <b>8 V or more?</b></li> </ul> </li> </ul>	Yes	Go to Step 7.
		No	Go to the next step.
4	<b>INSPECT COIL ANTENNA INPUT SIGNAL CIRCUIT</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Disconnect the instrument cluster connector.</li> <li>• Turn the ignition switch to the ON position.</li> <li>• Measure the voltage at instrument cluster terminal 2S. <ul style="list-style-type: none"> <li>▪ Is the voltage <b>8 V or more?</b></li> </ul> </li> </ul>	Yes	Replace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the instrument cluster.  (See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION.</b> )  (See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM].</b> )
		No	Go to the next step.

5	<b>INSPECT COMMUNICATION CIRCUIT (INPUT) FOR CONTINUITY</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Is there continuity between coil antenna terminal B and instrument cluster terminal 2S?</li> </ul>	Yes	Go to the next step.
		No	Repair the wiring harness.
6	<b>INSPECT COIL ANTENNA INPUT SIGNAL CIRCUIT</b> <ul style="list-style-type: none"> <li>Measure the resistance between coil antenna terminal B and ground. <ul style="list-style-type: none"> <li>Is the resistance <b>10 kilohms or more?</b></li> </ul> </li> </ul>	Yes	Replace the coil antenna.  (See <a href="#">COIL ANTENNA REMOVAL/INSTALLATION [KEYLESS ENTRY SYSTEM]</a> .)
		No	Repair the wiring harness.
7	<b>INSPECT COIL ANTENNA OUTPUT SIGNAL CIRCUIT</b> <ul style="list-style-type: none"> <li>Connect the coil antenna connector and the instrument cluster connector.</li> <li>Turn the ignition switch to the ON position.</li> <li>Measure the voltage at coil antenna terminal A. <ul style="list-style-type: none"> <li>Is the voltage <b>8 V or more?</b></li> </ul> </li> </ul>	Yes	Replace the coil antenna.  (See <a href="#">COIL ANTENNA REMOVAL/INSTALLATION [KEYLESS ENTRY SYSTEM]</a> .)
		No	Go to the next step.
8	<b>INSPECT COIL ANTENNA OUTPUT SIGNAL CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the coil antenna connector.</li> <li>Turn the ignition switch to the ON position.</li> <li>Measure the voltage at coil antenna terminal A. <ul style="list-style-type: none"> <li>Is the voltage <b>8 V or more?</b></li> </ul> </li> </ul>	Yes	Replace the coil antenna.  (See <a href="#">COIL ANTENNA REMOVAL/INSTALLATION [KEYLESS ENTRY SYSTEM]</a> .)
		No	Go to the next step.
9	<b>INSPECT COMMUNICATION CIRCUIT (OUTPUT) FOR CONTINUITY</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the instrument cluster connector.</li> <li>Is there continuity between coil antenna terminal A and instrument cluster terminal 2Q?</li> </ul>	Yes	Repair the wiring harness.
		No	Go to the next step.

10	<b>INSPECT COIL ANTENNA OUTPUT SIGNAL CIRCUIT</b> <ul style="list-style-type: none"><li>• Measure the resistance between instrument cluster terminal 2Q and ground.<ul style="list-style-type: none"><li>▪ Is the resistance <b>10 kilohms or more?</b></li></ul></li></ul>	Yes	Replace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the instrument cluster.  (See <a href="#">INSTRUMENT CLUSTER REMOVAL/INSTALLATION</a> .)  (See <a href="#">IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]</a> .)
		No	Repair the wiring harness.



## 2008 - MX-5 - Body and Accessories

### SECURITY LIGHT 12, DTC B2103/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]

<b>SECURITY LIGHT: 12</b>	<ul style="list-style-type: none"> <li>Coil antenna malfunction</li> <li>The PCM determined a malfunction in the coil antenna even though it is normal.</li> </ul>
<b>DTC: B2103/P1260</b>	
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>Coil antenna malfunction</li> <li>The PCM determined a malfunction in the coil antenna even though it is normal.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Coil antenna malfunction</li> <li>Poor connection of the coil antenna connector</li> <li>PCM malfunction</li> </ul>

### Diagnostic Procedure

STEP	INSPECTION		ACTION
1	<b>INSPECT CONNECTOR CONNECTION</b> <ul style="list-style-type: none"> <li>Are the coil antenna connector and the instrument cluster connector securely connected?</li> </ul>	Yes	Replace the coil antenna, then go to the next step.  (See <a href="#">COIL ANTENNA REMOVAL/INSTALLATION [KEYLESS ENTRY SYSTEM]</a> .)
		No	Connect the connector securely.
2	<b>INSPECT PCM</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position.</li> <li>Is the DTC displayed? <ul style="list-style-type: none"> <li>Security light: 12</li> </ul> </li> </ul>	Yes	Replace the PCM and perform the resetting procedure for the immobilizer system when replacing the PCM.  (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)  (See <a href="#">IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]</a> .)

	▪ M-MDS: B2103/P1260		No DTC troubleshooting completed.
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SECURITY LIGHT 13, DTC B1600/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]

SECURITY LIGHT: 13	The key ID number data cannot be read.
DTC: B1600/P1260	
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The key ID number data cannot be read.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• No transponder in the key</li><li>• Transponder malfunction (Key ID number is not output)</li><li>• Coil antenna malfunction</li><li>• Instrument cluster malfunction</li><li>• Any of the following items are touching or near the key head.<ul style="list-style-type: none"><li>▪ Spare keys</li><li>▪ Keys for other vehicles equipped with an immobilizer system</li><li>▪ Any metallic object</li><li>▪ Any electronic device, or any credit or other cards with magnetic strips</li></ul></li></ul>

### EXAMPLES:



METAL RING LYING ON KEY HEAD



METAL PART OF ANOTHER  
KEY TOUCHING KEY HEAD



KEY IS NEAR OR TOUCHING  
ANOTHER IMMOBILIZER SYSTEM KEY

### Diagnostic Procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY DTC</b> <ul style="list-style-type: none"> <li>Is B1600/P1260 displayed?</li> </ul>	Yes Go to Step 3.
		No Go to the next step.
2	<b>VERIFY DTC</b> <ul style="list-style-type: none"> <li>Is B2431/P1260 displayed?</li> </ul>	Yes Perform the DTC inspection for "SECURITY LIGHT: 13, M-MDS: B2431/P1260".  (See <b>SECURITY LIGHT 13, DTC B2431/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]</b> .)
		No Go to the next step.
3	<b>VERIFY WHETHER KEY IS VALID OR NOT</b> <ul style="list-style-type: none"> <li>Are there any keys with which the engine can be started, other than the key that is a cause of the displayed DTC?</li> </ul>	Yes Go to Step 5.
		No Go to the next step.

4	<p><b>VERIFY WHETHER MALFUNCTION IS IN KEY OR COIL ANTENNA</b></p> <ul style="list-style-type: none"> <li>Using the M-MDS, register an additional key.</li> </ul> <p>(See <a href="#">IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]</a>.)</p> <ul style="list-style-type: none"> <li>Using the registered key, turn the ignition switch to the ON position.</li> <li>Verify the DTC using the M-MDS. <ul style="list-style-type: none"> <li>Is B1600/P1260 displayed again?</li> </ul> </li> </ul>	Yes	<p>Replace the coil antenna, then go to Step 6.</p> <p>(See <a href="#">COIL ANTENNA REMOVAL/INSTALLATION [KEYLESS ENTRY SYSTEM]</a>.)</p>
5	<p><b>VERIFY WHETHER MALFUNCTION IS IN KEY OR COIL ANTENNA</b></p> <ul style="list-style-type: none"> <li>Using another valid key, turn the ignition switch to the ON position.</li> <li>Verify the DTC Using the M-MDS. <ul style="list-style-type: none"> <li>Is B1600/P1260 displayed again?</li> </ul> </li> </ul>	Yes	<p>Replace the coil antenna, then go to the next step.</p> <p>(See <a href="#">COIL ANTENNA REMOVAL/INSTALLATION [KEYLESS ENTRY SYSTEM]</a>.)</p>
6	<p><b>INSPECT INSTRUMENT CLUSTER</b></p> <ul style="list-style-type: none"> <li>Using the registered key, turn the ignition switch to the ON position. <ul style="list-style-type: none"> <li>Is B1600/P1260 displayed again?</li> </ul> </li> </ul>	Yes	<p>Replace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the instrument cluster.</p> <p>(See <a href="#">INSTRUMENT CLUSTER REMOVAL/INSTALLATION.</a>)</p> <p>(See <a href="#">IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]</a>.)</p>
		No	DTC troubleshooting completed.



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SECURITY LIGHT 13, DTC B2431/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]

SECURITY LIGHT: 13	Key ID number registration error
DTC: B2431/P1260	
DETECTION CONDITION	<ul style="list-style-type: none"><li>• Key ID number registration error</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Errors during key ID number registration procedure</li><li>• Any of the following items are touching or near the key head.<ul style="list-style-type: none"><li>▪ Spare keys</li><li>▪ Keys for other vehicles equipped with an immobilizer system</li><li>▪ Any metallic object</li><li>▪ Any electronic device, or any credit or other cards with magnetic strips</li></ul></li></ul>

#### EXAMPLES:



METAL RING LYING ON KEY HEAD



METAL PART OF ANOTHER  
KEY TOUCHING KEY HEAD



KEY IS NEAR OR TOUCHING  
ANOTHER IMMOBILIZER SYSTEM KEY

#### Diagnostic Procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY DTC</b> <ul style="list-style-type: none"> <li>Is B2431/P1260 displayed?</li> </ul>	Yes Go to Step 3.
		No Go to the next step.
2	<b>VERIFY DTC</b> <ul style="list-style-type: none"> <li>Is B1600/P1260 displayed?</li> </ul>	Yes Perform the DTC inspection for "SECURITY LIGHT: 13, M-MDS: B1600/P1260".  (See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]</b> .)
		No Go to the next step.
3	<b>INSPECT INSTRUMENT CLUSTER</b> <ul style="list-style-type: none"> <li>Using the M-MDS, clear the key ID number and re-register it.  (See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY</b></li> </ul>	Yes Replace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the instrument cluster.  (See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION.</b> )  (See <b>IMMOBILIZER SYSTEM COMPONENT</b>



ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM] .)	REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM] .)
<p><b>NOTE:</b></p> <ul style="list-style-type: none"><li>• Two or more keys must be registered to start the engine.</li><li>• Using the registered key, turn the ignition switch to the ON position.</li><li>• Verify the DTC Using the M-MDS.<ul style="list-style-type: none"><li>▪ Is B2431/P1260 displayed again?</li></ul></li></ul>	<p>No DTC troubleshooting completed.</p>

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SECURITY LIGHT 14, DTC B1602/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]

SECURITY LIGHT: 14	The instrument cluster cannot read key ID number data normally.
DTC: B1602/P1260	
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The instrument cluster cannot read key ID number data normally.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Transponder (key) malfunction</li><li>• Coil antenna malfunction</li><li>• Instrument cluster malfunction</li><li>• Any of the following items are touching or near the key head.<ul style="list-style-type: none"><li>▪ Spare keys</li><li>▪ Keys for other vehicles equipped with an immobilizer system</li><li>▪ Any metallic object</li><li>▪ Any electronic device, or any credit or other cards with magnetic strips</li></ul></li></ul>

#### EXAMPLES:



METAL RING LYING ON KEY HEAD



METAL PART OF ANOTHER  
KEY TOUCHING KEY HEAD



KEY IS NEAR OR TOUCHING  
ANOTHER IMMOBILIZER SYSTEM KEY

#### Diagnostic Procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY WHETHER KEY IS VALID OR NOT</b> <ul style="list-style-type: none"> <li>Using another registered key, turn the ignition switch to the ON position.</li> <li>If there is not another registered key, register an additional key using the M-MDS and turn the ignition key to the ON position using the registered key.</li> </ul> <p>(See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]</b>.)</p> <ul style="list-style-type: none"> <li>Is the DTC displayed again? <ul style="list-style-type: none"> <li>Security light: 14</li> <li>M-MDS: B1602/P1260</li> </ul> </li> </ul>	Yes Replace the coil antenna, then go to the next step.  (See <b>COIL ANTENNA REMOVAL/INSTALLATION [KEYLESS ENTRY SYSTEM]</b> .)
		No <ul style="list-style-type: none"> <li>Dispose of the malfunctioning key.</li> <li>Register a new key if necessary.</li> </ul> <p>(See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]</b>.)</p>
2	<b>INSPECT INSTRUMENT CLUSTER</b> <ul style="list-style-type: none"> <li>Using another registered key, turn the</li> </ul>	Yes Replace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the

	<p>ignition switch to the ON position.</p> <ul style="list-style-type: none"><li>• Is the DTC displayed again?<ul style="list-style-type: none"><li>▪ Security light: 14</li><li>▪ M-MDS: B1602/P1260</li></ul></li></ul>	<p>instrument cluster.</p> <p>(See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION</b>.)</p> <p>(See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]</b>.)</p>
		<p>No DTC troubleshooting completed.</p>

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### SECURITY LIGHT 15, DTC B1601/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]

<b>SECURITY LIGHT: 15</b>	The instrument cluster has detected unregistered key ID number.
<b>DTC: B1601/P1260</b>	
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The instrument cluster has detected unregistered key ID number.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>No keys have been registered after replacing the instrument cluster.</li> <li>Unregistered key used</li> <li>Attempt made to register a ninth key</li> <li>Instrument cluster malfunction</li> </ul>

### Diagnostic Procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY NUMBER OF REGISTERED KEYS</b> <ul style="list-style-type: none"> <li>Using the M-MDS, perform the PID/data monitor inspection and confirm the number of registered keys.  (See <a href="#">PID/DATA MONITOR TABLE [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]</a>.)</li> <li>Are one or more keys registered?</li> </ul>	Yes Go to the next step.
		No Go to Step 3.
2	<b>VERIFY NUMBER OF REGISTERED KEYS</b>	Yes Using the M-MDS, clear the key ID numbers as necessary, then go to the next step.

	<ul style="list-style-type: none"><li>Using the M-MDS, perform the PID/data monitor inspection and confirm the number of registered keys.  (See <b>PID/DATA MONITOR TABLE [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]</b>.)</li><li>Are eight keys registered?</li></ul>	No	Go to the next step.
3	<b>INSPECT INSTRUMENT CLUSTER</b> <ul style="list-style-type: none"><li>Using the M-MDS, register the key ID number.  (See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]</b>.)</li></ul> <b>NOTE:</b> <ul style="list-style-type: none"><li>Two or more keys must be registered to start the engine.</li><li>Using the registered key, turn the ignition switch to the ON position.</li><li>Is the DTC displayed again?<ul style="list-style-type: none"><li>Security light: 15</li><li>M-MDS: B1601/P1260</li></ul></li></ul>	Yes	Replace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the instrument cluster.  (See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION</b> .)  (See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]</b> .)
		No	DTC troubleshooting completed.

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### SECURITY LIGHT 21, DTC B1213/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]

<b>SECURITY LIGHT: 21</b>	Only one key ID number is registered.
<b>DTC: B1213/P1260</b>	
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>Only one key is registered.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Only one registered key</li> </ul>

### Diagnostic Procedure

STEP	INSPECTION		ACTION
1	<b>VERIFY NUMBER OF REGISTERED KEYS</b> <ul style="list-style-type: none"> <li>Using the M-MDS, perform the PID/data monitor inspection and confirm the number of registered keys.</li> </ul> (See <b>PID/DATA MONITOR TABLE [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]</b> .) <ul style="list-style-type: none"> <li>Are two or more keys registered?</li> </ul>	Yes	Replace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the instrument cluster.  (See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]</b> .)  (See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]</b> .)
		No	<ul style="list-style-type: none"> <li>Using the M-MDS, clear the key ID number and register a new key if necessary.</li> </ul> (See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]</b> .) <ul style="list-style-type: none"> <li>Go to the next step.</li> </ul>
2	<b>VERIFY DTC</b>	Yes	Replace the instrument cluster and perform the

	<ul style="list-style-type: none"><li>• Using the registered key, turn the ignition switch to the ON position.</li><li>• Is the DTC displayed again?<ul style="list-style-type: none"><li>▪ Security light: 21</li><li>▪ M-MDS: B1213/P1260</li></ul></li></ul>	resetting procedure for the immobilizer system when replacing the instrument cluster.  (See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION.</b> )  (See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM].</b> )
		No DTC troubleshooting completed.



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### SECURITY LIGHT 22, DTC B2141/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]

<b>SECURITY LIGHT:</b> 22	Communication error between the instrument cluster and the PCM (data transfer error)
<b>DTC: B2141/P1260</b>	
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>Communication error between the instrument cluster and the PCM (data transfer error)</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Malfunction in the wiring harness (CAN line) between the instrument cluster and the PCM</li> <li>Instrument cluster malfunction</li> <li>PCM malfunction</li> </ul>

### Diagnostic Procedure

STEP	INSPECTION		ACTION
1	<b>VERIFY DTC</b> <ul style="list-style-type: none"> <li>Are either U1900 or U0073, or both displayed, by either the instrument cluster or the PCM, or both?</li> </ul>	Yes	Perform troubleshooting according to the corresponding DTC inspection.  (See <b>DTC U0073, U2516 [MULTIPLEX COMMUNICATION SYSTEM]</b> .)
		No	Go to the next step.
2	<b>VERIFY DTC</b> <ul style="list-style-type: none"> <li>Using the registered key, turn the ignition switch to the ON position.</li> <li>Is the DTC displayed? <ul style="list-style-type: none"> <li>Security</li> </ul> </li> </ul>	Yes	<ul style="list-style-type: none"> <li>Replace the PCM and perform the resetting procedure for the immobilizer system when replacing the PCM.</li> </ul> (See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]</b> .)

	light: 22 ■ M-MDS: B2141/P1260		• Go to the next step.
			No DTC troubleshooting completed.
3	<b>EXAMINE INSTRUMENT CLUSTER AND PCM</b> • Is the DTC displayed again? ■ Security light: 22 ■ M-MDS: B2141/P1260	Yes	• Replace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the instrument cluster. (See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION</b> .) (See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]</b> .) • Go to the next step.
			No DTC troubleshooting completed.
4	<b>EXAMINE PCM</b> • Is the DTC displayed again? ■ Security light: 22 ■ M-MDS: B2141/P1260	Yes	• Replace the PCM and perform the resetting procedure for the immobilizer system when replacing the PCM. (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .) (See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]</b> .)
			No DTC troubleshooting completed.

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### SECURITY LIGHT 23, DTC B2139/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]

<b>SECURITY LIGHT:</b> <b>23</b>	ID number data in the PCM and the instrument cluster do not match.
<b>DTC: B2139/P1260</b>	
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>ID number data in the instrument cluster and the PCM are different.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Necessary procedures were not performed using the M-MDS after replacing the PCM.</li> <li>Instrument cluster malfunction</li> <li>PCM malfunction</li> </ul>

### Diagnostic Procedure

STEP	INSPECTION		ACTION
1	<b>VERIFY DTC</b> <ul style="list-style-type: none"> <li>Are either U1900 or U0073, or both, displayed, by either the instrument cluster or the PCM, or both?</li> </ul>	Yes	Perform troubleshooting according to the corresponding DTC inspection.  (See <b>DTC U0073, U2516 [MULTIPLEX COMMUNICATION SYSTEM]</b> .)
		No	Go to the next step.
2	<b>VERIFY THAT KEY IS PROGRAMMED TO PCM</b> <ul style="list-style-type: none"> <li>Perform procedures for when replacing the PCM.</li> </ul> (See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION</b> )	Yes	Go to the next step.
		No	DTC troubleshooting completed.

	<p><b>AND CLEARING [KEYLESS ENTRY SYSTEM].)</b></p> <ul style="list-style-type: none"><li>Using the registered key, turn the ignition switch to the ON position.</li><li>Is the DTC displayed?<ul style="list-style-type: none"><li>Security light: 23</li><li>M-MDS: B2139/P1260</li></ul></li></ul>		
3	<p><b>VERIFY THAT KEY IS PROGRAMMED TO INSTRUMENT CLUSTER</b></p> <ul style="list-style-type: none"><li>Perform procedures for when replacing the instrument cluster.</li></ul> <p>(See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM].)</b></p> <ul style="list-style-type: none"><li>Using the registered key, turn the ignition switch to the ON position.</li><li>Is the DTC displayed?<ul style="list-style-type: none"><li>Security light: 23</li><li>M-MDS: B2139/P1260</li></ul></li></ul>	Yes	<ul style="list-style-type: none"><li>Replace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the instrument cluster.</li></ul> <p>(See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION.</b>)</p> <p>(See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM].)</b></p> <ul style="list-style-type: none"><li>Go to the next step.</li></ul>
		No	DTC troubleshooting completed.
4	<p><b>VERIFY DTC</b></p> <ul style="list-style-type: none"><li>Is the DTC displayed again?<ul style="list-style-type: none"><li>Security light: 23</li><li>M-MDS: B2139/P1260</li></ul></li></ul>	Yes	<ul style="list-style-type: none"><li>Replace the PCM and perform the resetting procedure for the immobilizer system when replacing the PCM.</li></ul> <p>(See <b>PCM REMOVAL/INSTALLATION [LF].)</b></p> <p>(See <b>IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM].)</b></p>
		No	DTC troubleshooting completed.



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DTC B1342 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]

DTC: B1342	Instrument cluster malfunction
DETECTION CONDITION	<ul style="list-style-type: none"><li>• Instrument cluster malfunction</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Instrument cluster malfunction</li></ul>

Diagnostic Procedure

STEP	INSPECTION		ACTION
1	<b>EXAMINE INSTRUMENT CLUSTER AND PCM</b> <ul style="list-style-type: none"><li>• Is the DTC displayed?<ul style="list-style-type: none"><li>▪ M-MDS: B1342</li></ul></li></ul>	Yes	Replace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the instrument cluster.  (See <a href="#">INSTRUMENT CLUSTER REMOVAL/INSTALLATION</a> .)  (See <a href="#">IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]</a> .)
		No	DTC troubleshooting completed.

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### SECURITY LIGHT 16, DTC U2510/P1260 [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]

<b>SECURITY LIGHT: 16</b>	Communication error between the instrument cluster and the PCM (no response)
<b>DTC: U2510/P1260</b>	
<b>DETECTION CONDITION</b>	Communication error between the instrument cluster and the PCM (no response)
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Malfunction in the wiring harness (CAN line) between the instrument cluster and the PCM</li> <li>• PCM malfunction</li> <li>• Instrument cluster malfunction</li> </ul>

### Diagnostic Procedure

STEP	INSPECTION		ACTION
1	<b>VERIFY DTC</b> <ul style="list-style-type: none"> <li>• Are either U0073, or both, displayed, by either the instrument cluster or the PCM, or both?</li> </ul>	Yes	Perform troubleshooting according to the corresponding DTC inspection.  (See <a href="#">DTC U0073, U2516 [MULTIPLEX COMMUNICATION SYSTEM]</a> .)
		No	Replace the instrument cluster and perform the resetting procedure for the immobilizer system when replacing the instrument cluster.  (See <a href="#">INSTRUMENT CLUSTER REMOVAL/INSTALLATION</a> .)  (See <a href="#">IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]</a> .)  Go to the next step.

2	<b>VERIFY DTC</b> <ul style="list-style-type: none"><li>Using the registered key, turn the ignition switch to the ON position.</li><li>Is the DTC displayed?<ul style="list-style-type: none"><li>Security light: 16</li><li>M-MDS: U2510 /P1260</li></ul></li></ul>	Yes	Replace the PCM and perform the resetting procedure for the immobilizer system when replacing the PCM.  (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)  (See <a href="#">IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]</a> .)
		No	DTC troubleshooting completed.



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DTC TABLE [MULTIPLEX COMMUNICATION SYSTEM]

DTC	Malfunction location	DTC output module	Page
U0073	CAN system communication error	<ul style="list-style-type: none"><li>• PCM</li><li>• TCM</li><li>• ABS HU/CM</li><li>• DSC HU/CM</li><li>• Power retractable hardtop control module</li><li>• Keyless control module</li><li>• Instrument cluster</li></ul>	(See <a href="#">DTC U0073, U2516 [MULTIPLEX COMMUNICATION SYSTEM]</a> .)
U0100	Communication error to PCM	<ul style="list-style-type: none"><li>• TCM</li><li>• DSC HU/CM</li><li>• Power retractable hardtop control module</li><li>• Keyless control module</li><li>• Instrument cluster</li></ul>	
		<ul style="list-style-type: none"><li>• PCM</li></ul>	

U0101	Communication error to TCM	<ul style="list-style-type: none"> <li>• DSC HU/CM</li> <li>• Power retractable hardtop control module</li> <li>• Instrument cluster</li> </ul>
U0121	Communication error to ABS HU/CM or DSC HU/CM	<ul style="list-style-type: none"> <li>• PCM</li> <li>• Instrument cluster</li> </ul>
U0155	Communication error to instrument cluster	<ul style="list-style-type: none"> <li>• PCM</li> <li>• DSC HU/CM</li> </ul>
U0207	Abnormal message from power retractable hardtop control module	Keyless control module
U0214	Communication error to keyless control module	Instrument cluster
U0323	Communication error to instrument cluster	Keyless control module
U1900	Communication error to other module	<ul style="list-style-type: none"> <li>• ABS HU/CM</li> <li>• DSC HU/CM</li> <li>• Steering angle sensor</li> </ul>
U2023	Abnormal message from PCM	<ul style="list-style-type: none"> <li>• ABS HU/CM</li> <li>• DSC HU/CM</li> <li>• Keyless control module</li> </ul>
U2197	Invalid vehicle speed signal data	Power retractable hardtop control module

(See **PROCEDURES FOR DETERMINING THE LOCATION OF A MALFUNCTION [MULTIPLEX COMMUNICATION SYSTEM]**.)

U2516	CAN system communication error	Steering angle sensor	(See <b>DTC U0073, U2516 [MULTIPLEX COMMUNICATION SYSTEM].</b> )
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### MULTIPLEX COMMUNICATION SYSTEM [MULTIPLEX COMMUNICATION SYSTEM]

#### Outline

- If the controller area network (CAN) system is malfunctioning, read the DTCs of the following modules, using the M-MDS to determine the malfunctioning system.
  - PCM
  - TCM
  - DSC HU/CM
  - ABS HU/CM
  - Power retractable hardtop control module
  - Keyless control module
  - Steering angle sensor
  - Instrument cluster

#### Flowchart

- Use the following flowchart to verify the cause of the trouble.

STEP	INSPECTION	ACTION
1	<b>INSPECT DTC INDICATION</b> <ul style="list-style-type: none"><li>• Using the M-MDS, inspect if DTCs are displayed for the following module:<ul style="list-style-type: none"><li>▪ PCM</li><li>▪ TCM</li><li>▪ DSC HU/CM</li><li>▪ ABS HU/CM</li><li>▪ Power retractable hardtop control module</li><li>▪ Keyless control module</li></ul></li></ul>	YesGo to the next step.
		NoGo to Step 5.

	<ul style="list-style-type: none"> <li>▪ Steering angle sensor</li> <li>▪ Instrument cluster</li> <li>• Are any DTCs displayed?</li> </ul>		
2	<b>INSPECT CAN SYSTEM-RELATED DTC</b> <ul style="list-style-type: none"> <li>• Are any DTCs other than the following displayed? <ul style="list-style-type: none"> <li>▪ U0073</li> <li>▪ U0100</li> <li>▪ U0101</li> <li>▪ U0121</li> <li>▪ U0155</li> <li>▪ U0207</li> <li>▪ U0214</li> <li>▪ U0323</li> <li>▪ U1900</li> <li>▪ U2023</li> <li>▪ U2197</li> <li>▪ U2516</li> </ul> </li> </ul>	Yes	Repair the malfunctioning part by following the related DTC inspection.  Go to the next step.
		No	Go to the next step.
3	<b>INSPECT CAN SYSTEM-RELATED DTC</b> <ul style="list-style-type: none"> <li>• Are any of the following DTCs displayed? <ul style="list-style-type: none"> <li>▪ PCM: U0073, U0101, U0121, U0155</li> <li>▪ TCM: U0073, U0100</li> <li>▪ DSC HU/CM: U0073, U0100, U0101, U0155, U1900, U2023</li> <li>▪ ABS HU/CM: U0073, U1900, U2023</li> <li>▪ Power retractable hardtop control module: U0073, U0100, U0101, U2197</li> <li>▪ Keyless control module: U0073, U0100, U0207, U0323, U2023</li> <li>▪ Steering angle sensor: U1900, U2516</li> <li>▪ Instrument cluster: U0073, U0100, U0101, U0121, U0214</li> </ul> </li> </ul>	Yes	Repair the malfunctioning part by following the DTC inspection.  Go to the next step.
		No	Troubleshooting completed.
4	<b>VERIFY TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"> <li>• Clear the DTC from the CAN system-related modules</li> </ul>	Yes	Go back to Step 3.

	<p>using the M-MDS.</p> <ul style="list-style-type: none"><li>• Start the engine.</li><li>• Are any of the CAN related DTCs displayed?</li></ul>	No	Troubleshooting completed.
5	<b>INSPECT COMMUNICATION CONDITION</b> <ul style="list-style-type: none"><li>• Is there a response from the following modules?<ul style="list-style-type: none"><li>▪ PCM</li><li>▪ TCM</li><li>▪ DSC HU/CM</li><li>▪ ABS HU/CM</li><li>▪ Power retractable hardtop control module</li><li>▪ Keyless control module</li><li>▪ Steering angle sensor</li><li>▪ Instrument cluster</li></ul></li></ul>	Yes	Troubleshooting completed.
		No	Go to the next step.
6	<b>INSPECT MODULES THAT DO NOT RESPOND</b> <ul style="list-style-type: none"><li>• Inspect the power supply and the ground circuit for any units that do not respond.</li><li>• Are they normal?</li></ul>	Yes	Go to the next step.
		No	Repair the malfunctioning part, then go back to Step 1.
7	<b>INSPECT CONNECTOR AND WIRING HARNESS BETWEEN MODULES THAT DO NOT RESPOND AND DLC-2</b> <ul style="list-style-type: none"><li>• Turn the ignition switch to the LOCK position.</li><li>• Inspect the wiring harness and connector between any module that does not respond and the DLC-2.  <b>PCM—DLC-2</b><ul style="list-style-type: none"><li>▪ 1AM—F</li><li>▪ 1AI—E</li></ul><b>TCM—DLC-2</b><ul style="list-style-type: none"><li>▪ 1G—F</li><li>▪ 1C—E</li></ul><b>DSC HU/CM—DLC-2</b><ul style="list-style-type: none"><li>▪ X—F</li><li>▪ W—E</li></ul><b>ABS HU/CM—DLC-2</b><ul style="list-style-type: none"><li>▪ Z—F</li></ul></li></ul>	Yes	Repair the malfunctioning part, then go back to Step 1.
		No	Go to the next step.

	<ul style="list-style-type: none"> <li>▪ Y—E</li> </ul> <p><b>Power retractable hardtop control module—DLC-2</b></p> <ul style="list-style-type: none"> <li>▪ 3S—F</li> <li>▪ 3U—E</li> </ul> <p><b>Keyless control module—DLC-2</b></p> <ul style="list-style-type: none"> <li>▪ 4AA—F</li> <li>▪ 4Z—E</li> </ul> <p><b>Steering angle sensor—DLC-2</b></p> <ul style="list-style-type: none"> <li>▪ E—F</li> <li>▪ F—E</li> </ul> <p><b>Instrument cluster—DLC-2</b></p> <ul style="list-style-type: none"> <li>▪ 1J—F</li> <li>▪ 1L—E</li> </ul> <ul style="list-style-type: none"> <li>• Is there any malfunction?</li> </ul>		
8	<b>INSPECT WIRING HARNESS</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position (Engine off).</li> <li>• Measure the voltage between the following terminals. <ul style="list-style-type: none"> <li>▪ DLC-2 terminals F and GND</li> <li>▪ DLC-2 terminals E and GND</li> </ul> </li> <li>• Is the voltage <b>2.0—3.0 V</b>?</li> </ul>	Yes	Go to the next step.
		No	Go to Step 12.
9	<b>INSPECT WIRING HARNESS</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Measure the resistance between the following terminals. <ul style="list-style-type: none"> <li>▪ DLC-2 terminals F and E</li> </ul> </li> <li>• Is the resistance <b>59—65 ohms</b>?</li> </ul>	Yes	Replace the modules that do not respond, then go back to Step 1.
		No	Go to the next step.
10	<b>INSPECT PCM</b> <ul style="list-style-type: none"> <li>• Disconnect the PCM connector.</li> <li>• Measure the resistance between following terminals. <ul style="list-style-type: none"> <li>▪ PCM terminals 1AM and 1AI (part-side)</li> </ul> </li> <li>• Is the resistance <b>118—130 ohms</b>?</li> </ul>	Yes	Go to the next step.
		No	Replace the PCM, then go to the next step.

11	<b>INSPECT INSTRUMENT CLUSTER</b> <ul style="list-style-type: none"><li>• Disconnect the instrument cluster connector.</li><li>• Measure the resistance between the following terminals.<ul style="list-style-type: none"><li>▪ Instrument cluster terminals 1J and 1L (part-side)</li></ul></li><li>• Is the resistance <b>118—130 ohms</b>?</li></ul>	Yes	Go to next step.
		No	Replace the instrument cluster, then go to the next step.
12	<b>CLASSIFY WIRING HARNESS MALFUNCTION OR MODULE MALFUNCTION</b> <ul style="list-style-type: none"><li>• Turn the ignition switch to the LOCK position.</li><li>• Disconnect the connector of any unit that does not respond. (If there are two or more units that do not respond, disconnect only one of the units.)</li><li>• Turn the ignition switch to the ON position.</li><li>• Measure the voltage between the following terminals.<ul style="list-style-type: none"><li>▪ DLC-2 terminals F and GND</li><li>▪ DLC-2 terminals E and GND</li></ul></li><li>• Is voltage <b>2.0—3.0 V</b>?</li></ul>	Yes	Go to the next step.
		No	Retry this step with other module connector disconnected.  If all units that do not respond are disconnected, go to Step 14.
13	<b>INSPECT WIRING HARNESS OF ANY UNIT THAT DOES NOT RESPOND</b> <ul style="list-style-type: none"><li>• Turn the ignition switch to the LOCK position.</li><li>• Inspect for continuity between the following connector terminals of any disconnected unit.<ul style="list-style-type: none"><li><b>PCM—DLC-2</b><ul style="list-style-type: none"><li>▪ 1AM—other terminals</li><li>▪ 1AI—other terminals</li></ul></li><li><b>TCM—DLC-2</b><ul style="list-style-type: none"><li>▪ 1G—other terminals</li><li>▪ 1C—other terminals</li></ul></li><li><b>DSC HU/CM—DLC-2</b><ul style="list-style-type: none"><li>▪ X—other terminals</li><li>▪ W—other terminals</li></ul></li><li><b>ABS HU/CM—DLC-2</b><ul style="list-style-type: none"><li>▪ Z—other terminals</li><li>▪ Y—other terminals</li></ul></li></ul></li></ul>	Yes	Repair or replace the wiring harness, then go back to Step 1.
		No	Replace the disconnected unit, then go back to Step 1.



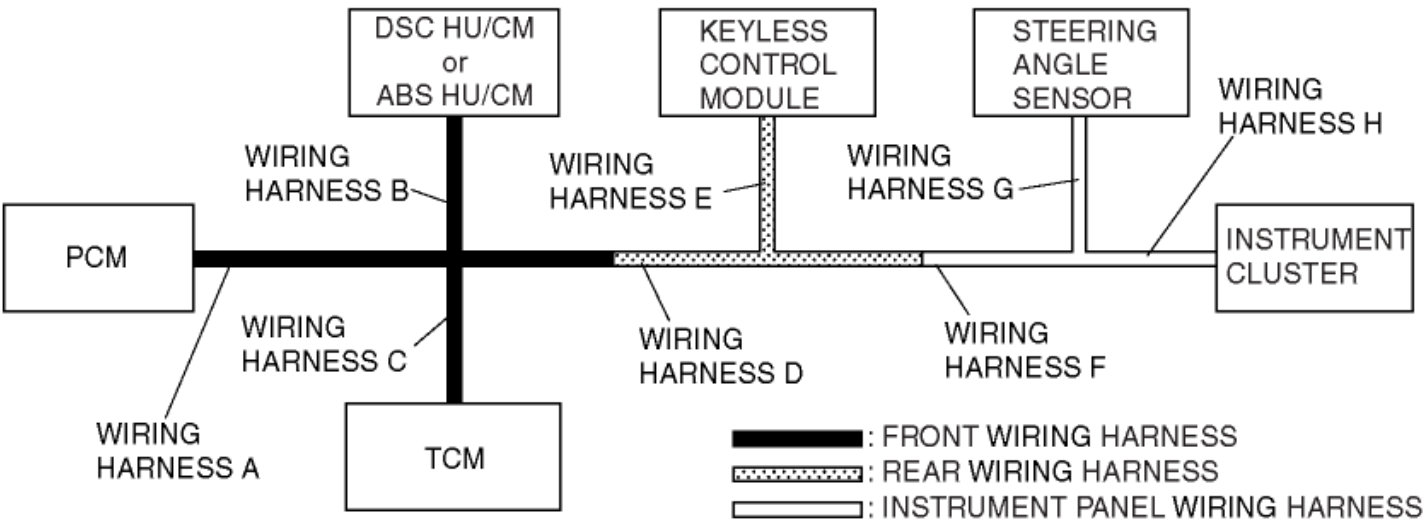
	<p><b>Power retractable hardtop control module—DLC-2</b></p> <ul style="list-style-type: none"> <li>▪ 3S—other terminals</li> <li>▪ 3U—other terminals</li> </ul> <p><b>Keyless control module—DLC-2</b></p> <ul style="list-style-type: none"> <li>▪ 4AA—other terminals</li> <li>▪ 4Z—other terminals</li> </ul> <p><b>Steering angle sensor—DLC-2</b></p> <ul style="list-style-type: none"> <li>▪ E—other terminals</li> <li>▪ F—other terminals</li> </ul> <p><b>Instrument cluster—DLC-2</b></p> <ul style="list-style-type: none"> <li>▪ 1J—other terminals</li> <li>▪ 1L—other terminals</li> </ul> <ul style="list-style-type: none"> <li>• Is there continuity?</li> </ul>		
14	<p><b>INSPECT CAN RELATED WIRING HARNESS</b></p> <ul style="list-style-type: none"> <li>• Inspect the related wiring harnesses (CAN_L and/or CAN_H) for the short circuit (to power supply or ground).</li> <li>• Is the wiring harness normal?</li> </ul>	Yes	Repair or replace the wiring harness, then go back to Step 1.
		No	Go back to Step 1.

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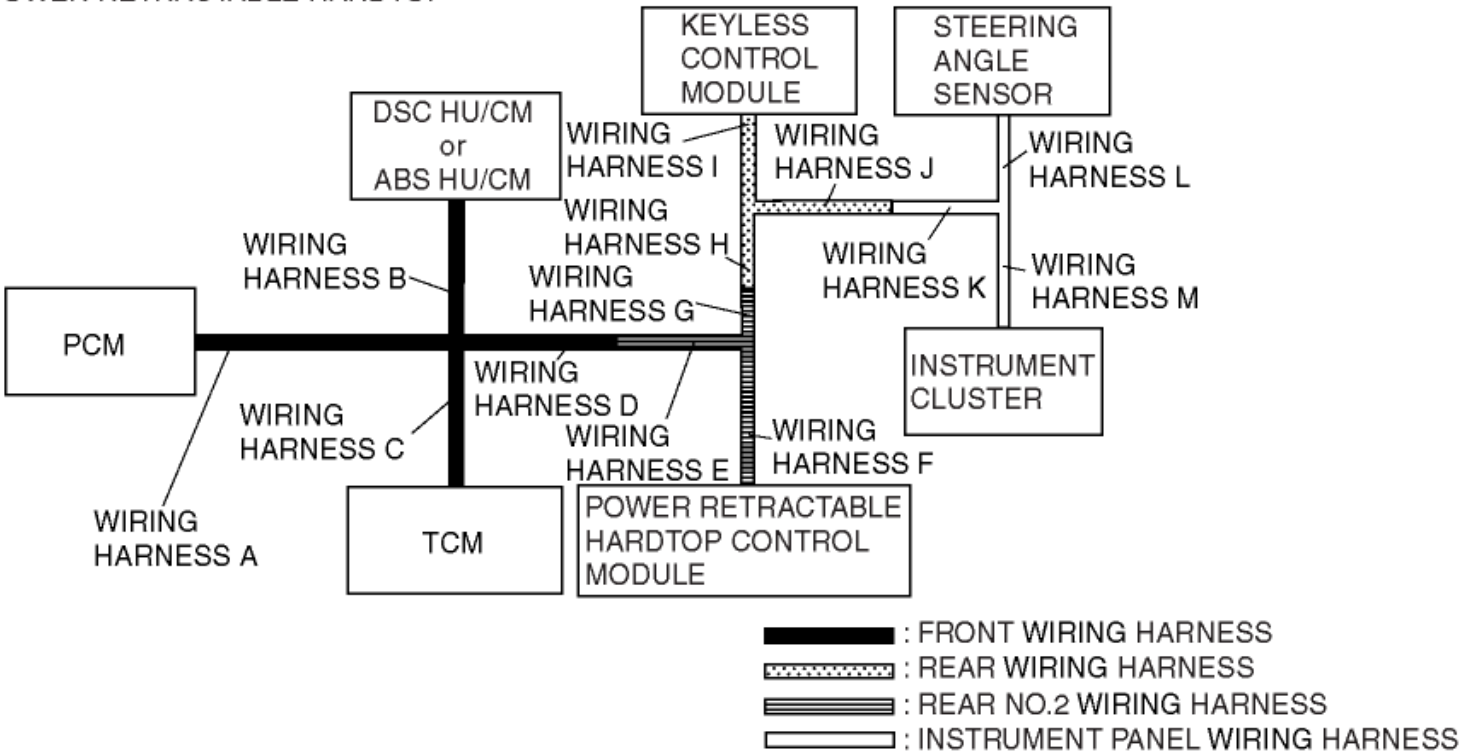
PROCEDURES FOR DETERMINING THE LOCATION OF A MALFUNCTION [MULTIPLEX COMMUNICATION SYSTEM]

System Wiring Diagram

WITHOUT POWER RETRACTABLE HARDTOP



WITH POWER RETRACTABLE HARDTOP



PCM

1. Inspect the display of DTC U0101, U0121 and/or U0155, using the M-MDS. (See [DTC TABLE \[MULTIPLEX COMMUNICATION SYSTEM\]](#).)
2. Referring to the following table, determine the malfunctioning part of the CAN system.

Without power retractable hardtop×: Normal—: Communication error

Module	Communication status			Malfunction location
	DSC HU/CM ABS HU/CM	TCM	Instrument cluster	
PCM	—	—	—	<ul style="list-style-type: none"><li>Wiring harness A</li><li>PCM</li></ul>
	×	—	×	<ul style="list-style-type: none"><li>Wiring harness C</li><li>TCM</li></ul>
	—	×	×	<ul style="list-style-type: none"><li>Wiring harness B</li><li>DSC HU/CM or ABS HU/CM</li></ul>
	×	×	—	<ul style="list-style-type: none"><li>Wiring harness D</li><li>Wiring harness F</li><li>Wiring harness H</li><li>Instrument cluster</li></ul>

With power retractable hardtop×: Normal—: Communication error

Module	Communication status			Malfunction location
	DSC HU/CM ABS HU/CM	TCM	Instrument cluster	
PCM	—	—	—	<ul style="list-style-type: none"><li>Wiring harness A</li><li>PCM</li></ul>
	×	—	×	<ul style="list-style-type: none"><li>Wiring harness C</li><li>TCM</li></ul>
	—	×	×	<ul style="list-style-type: none"><li>Wiring harness B</li><li>DSC HU/CM or ABS HU/CM</li></ul>
				<ul style="list-style-type: none"><li>Wiring harness D</li><li>Wiring harness E</li><li>Wiring harness G</li><li>Wiring harness H</li></ul>

	×	×	—	<ul style="list-style-type: none"> <li>• Wiring harness J</li> <li>• Wiring harness K</li> <li>• Wiring harness M</li> <li>• Instrument cluster</li> </ul>
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TCM

1. Inspect the display of DTC U0100 using the M-MDS. (See [DTC TABLE \[MULTIPLEX COMMUNICATION SYSTEM\]](#).)
2. Referring to the following table, determine the malfunctioning part of the CAN system.

×: Normal—: Communication error

Module	Communication status	Malfunction location
	PCM	
TCM	—	<ul style="list-style-type: none"> <li>• Wiring harness A</li> <li>• Wiring harness C</li> <li>• TCM</li> <li>• PCM</li> </ul>

DSC HU/CM or ABS HU/CM

1. Inspect the display of DTC U0100 (DSC), U0101 (DSC), U0155 (DSC), U1900 and/or U2023, using the M-MDS. (See [DTC TABLE \[MULTIPLEX COMMUNICATION SYSTEM\]](#).)
2. Referring to the following table, determine the malfunctioning part of the CAN system.

Without power retractable hardtop×: Normal—: Communication error

Module	Communication status			Malfunction location
	PCM	TCM	Instrument cluster	
DSC HU/CM or ABS HU/CM	—	—	—	<ul style="list-style-type: none"> <li>• Wiring harness B</li> <li>• DSC HU/CM or ABS HU/CM</li> </ul>
	×	—	×	<ul style="list-style-type: none"> <li>• Wiring harness C</li> <li>• TCM</li> </ul>
	—	×	×	<ul style="list-style-type: none"> <li>• Wiring harness A</li> <li>• PCM</li> </ul>
	×	×	—	<ul style="list-style-type: none"> <li>• Wiring harness D</li> <li>• Wiring harness F</li> <li>• Wiring harness H</li> </ul>

				<ul style="list-style-type: none"> <li>Instrument cluster</li> </ul>
--	--	--	--	--

**With power retractable hardtop**×: Normal—: Communication error

Module	Communication status			Malfunction location
	PCM	TCM	Instrument cluster	
DSC HU/CM or ABS HU/CM	—	—	—	<ul style="list-style-type: none"> <li>Wiring harness B</li> <li>DSC HU/CM or ABS HU/CM</li> </ul>
	×	—	×	<ul style="list-style-type: none"> <li>Wiring harness C</li> <li>TCM</li> </ul>
	—	×	×	<ul style="list-style-type: none"> <li>Wiring harness A</li> <li>PCM</li> </ul>
	×	×	—	<ul style="list-style-type: none"> <li>Wiring harness D</li> <li>Wiring harness E</li> <li>Wiring harness G</li> <li>Wiring harness H</li> <li>Wiring harness J</li> <li>Wiring harness K</li> <li>Wiring harness M</li> <li>Instrument cluster</li> </ul>

**Power Retractable Hardtop Control Module**

1. Inspect the display of DTC U0100, U0101 and/or U2197, using the M-MDS. (See [DTC TABLE \[MULTIPLEX COMMUNICATION SYSTEM\]](#).)
  2. Referring to the following table, determine the malfunctioning part of the CAN system.
- ×: Normal—: Communication error

Module	Communication status				Malfunction location
	PCM	TCM	Keyless control module	Instrument cluster	
Power retractable hardtop control module	—	—	—	—	<ul style="list-style-type: none"> <li>Wiring harness F</li> <li>Power retractable hardtop control module</li> </ul>
	—	×	×	×	<ul style="list-style-type: none"> <li>Wiring harness A</li> <li>PCM</li> </ul>

	x	—	x	x	<ul style="list-style-type: none"> <li>• Wiring harness C</li> <li>• PCM</li> </ul>
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Keyless Control Module

1. Inspect the display of DTC U0100, U0323 and/or U2023 using the M-MDS.  
(See [DTC TABLE \[MULTIPLEX COMMUNICATION SYSTEM\]](#).)
2. Referring to the following table, determine the malfunctioning part of the CAN system.

Without power retractable hardtopx: Normal—: Communication error

Module	Communication status		Malfunction location
	PCM	Instrument cluster	
Keyless control module	—	—	<ul style="list-style-type: none"> <li>• Wiring harness E</li> <li>• Keyless control module</li> </ul>
	—	x	<ul style="list-style-type: none"> <li>• Wiring harness A</li> <li>• Wiring harness D</li> <li>• PCM</li> </ul>
	x	—	<ul style="list-style-type: none"> <li>• Wiring harness F</li> <li>• Wiring harness H</li> <li>• Instrument cluster</li> </ul>

With power retractable hardtopx: Normal—: Communication error

Module	Communication status			Malfunction location
	PCM	Instrument cluster	Power retractable hardtop control module	
Keyless control module	—	—	—	<ul style="list-style-type: none"> <li>• Wiring harness I</li> <li>• Keyless control module</li> </ul>
	—	x	x	<ul style="list-style-type: none"> <li>• Wiring harness A</li> <li>• Wiring harness D</li> <li>• Wiring harness E</li> <li>• PCM</li> </ul>
	x	—	x	<ul style="list-style-type: none"> <li>• Wiring harness J</li> <li>• Wiring harness K</li> <li>• Wiring harness M</li> </ul>

				<ul style="list-style-type: none"> <li>Instrument cluster</li> </ul>
	×	×	—	<ul style="list-style-type: none"> <li>Wiring harness F</li> <li>Keyless control module</li> </ul>

### Steering Angle Sensor

1. Inspect the display of DTC U1900 using the M-MDS. (See [DTC TABLE \[MULTIPLEX COMMUNICATION SYSTEM\]](#).)
2. Referring to the following table, determine the malfunctioning part of the CAN system.

**Without power retractable hardtop**×: Normal—: Communication error

Module	Communication status	Malfunction location
	DSC HU/CM	
Steering Angle Sensor	—	<ul style="list-style-type: none"><li>• Wiring harness B</li><li>• Wiring harness D</li><li>• Wiring harness F</li><li>• Wiring harness G</li><li>• DSC HU/CM</li><li>• Steering Angle Sensor</li></ul>

**With power retractable hardtop**×: Normal—: Communication error

Module	Communication status	Malfunction location
	DSC HU/CM	
Steering Angle Sensor	—	<ul style="list-style-type: none"><li>• Wiring harness B</li><li>• Wiring harness D</li><li>• Wiring harness E</li><li>• Wiring harness G</li><li>• Wiring harness H</li><li>• Wiring harness J</li><li>• Wiring harness K</li><li>• Wiring harness L</li><li>• DSC HU/CM</li><li>• Steering Angle Sensor</li></ul>

### Instrument Cluster

1. Inspect the display of DTC U0100, U0101, U0121, and/or U0214, using the M-MDS. (See **DTC TABLE [MULTIPLEX COMMUNICATION SYSTEM]**.)

2. Referring to the following table, determine the malfunctioning part of the CAN system.

**Without power retractable hardtop**×: Normal—: Communication error

Module	Communication status				Malfunction location
	PCM	TCM	DSC HU/CM ABS HU/CM	Keyless control module	
Instrument cluster	—	—	—	—	<ul style="list-style-type: none"> <li>Wiring harness F</li> <li>Wiring harness H</li> <li>Instrument cluster</li> </ul>
	—	—	—	×	<ul style="list-style-type: none"> <li>Wiring harness D</li> </ul>
	—	×	×	×	<ul style="list-style-type: none"> <li>Wiring harness A</li> <li>PCM</li> </ul>
	×	—	×	×	<ul style="list-style-type: none"> <li>Wiring harness C</li> <li>TCM</li> </ul>
	×	×	—	×	<ul style="list-style-type: none"> <li>Wiring harness B</li> <li>DSC HU/CM or ABS HU/CM</li> </ul>
	×	×	×	—	<ul style="list-style-type: none"> <li>Wiring harness E</li> <li>Keyless control module</li> </ul>

**With power retractable hardtop**×: Normal—: Communication error

Module	Communication status				Malfunction location
	PCM	TCM	DSC HU/CM ABS HU/CM	Keyless control module	
Instrument cluster	—	—	—	—	<ul style="list-style-type: none"> <li>Wiring harness J</li> <li>Wiring harness K</li> <li>Wiring harness M</li> <li>Instrument cluster</li> </ul>
	—	—	—	×	<ul style="list-style-type: none"> <li>Wiring harness D</li> <li>Wiring harness E</li> <li>Wiring harness G</li> <li>Wiring harness H</li> </ul>



	—	×	×	×	Wiring harness A • PCM
	×	—	×	×	• Wiring harness C • TCM
	×	×	—	×	• Wiring harness B • DSC HU/CM or ABS HU/CM
	×	×	×	—	• Wiring harness I • Keyless control module

## Repair Procedure

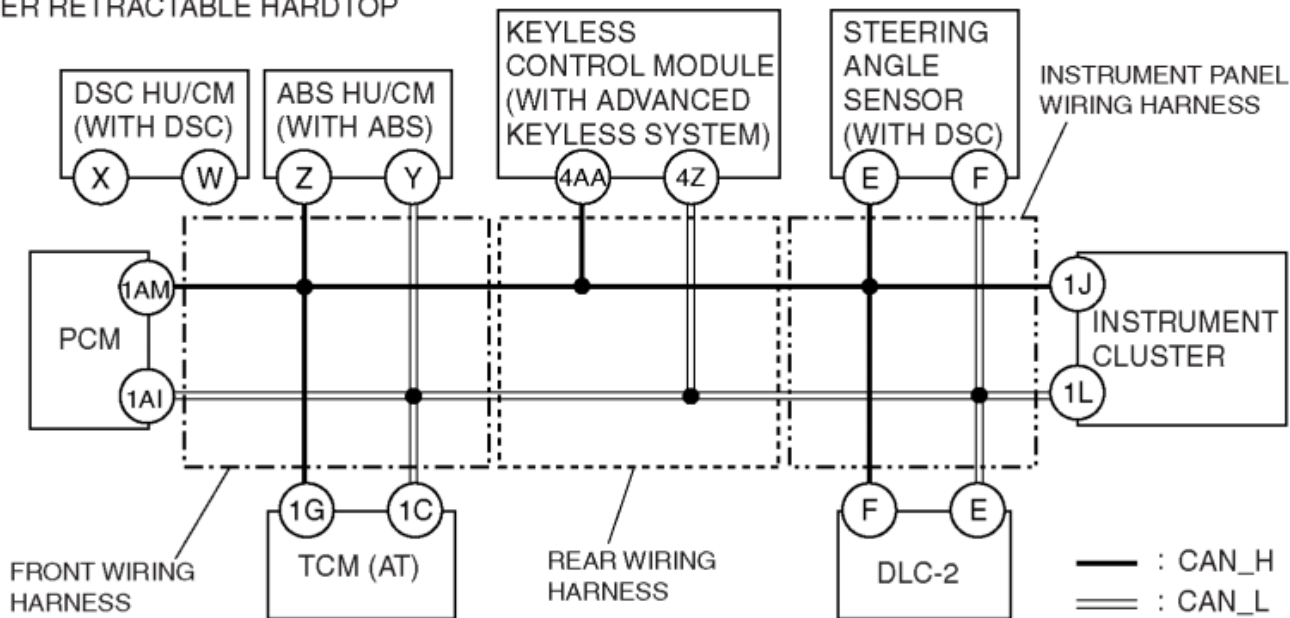
- Inspect the connector of malfunctioning module.
  - If there is any malfunction, repair or replace the connector.
- Inspect the malfunctioning wiring harnesses as follow:
  - If there is any malfunction, repair or replace the wiring harnesses.
  - If there is no malfunction, replace the malfunctioning module.
    - Short to GND
    - Short to power supply
    - Twisted pair short each other
    - Open circuit
- Make sure to reconnect all disconnected connectors.
- Clear the CAN system related DTCs using the M-MDS.
- Verify if the CAN system related DTCs are displayed using the M-MDS.
  - If the same following DTCs are present, replace the malfunctioning module.
    - U0073 (PCM, TCM, DSC HU/CM, ABS HU/CM, keyless control module, instrument cluster, power retractable hardtop control module)
    - U2516 (steering angle sensor)
  - If other DTC is present, perform the appropriate DTC inspection. (See [DTC TABLE \[MULTIPLEX COMMUNICATION SYSTEM\]](#).)

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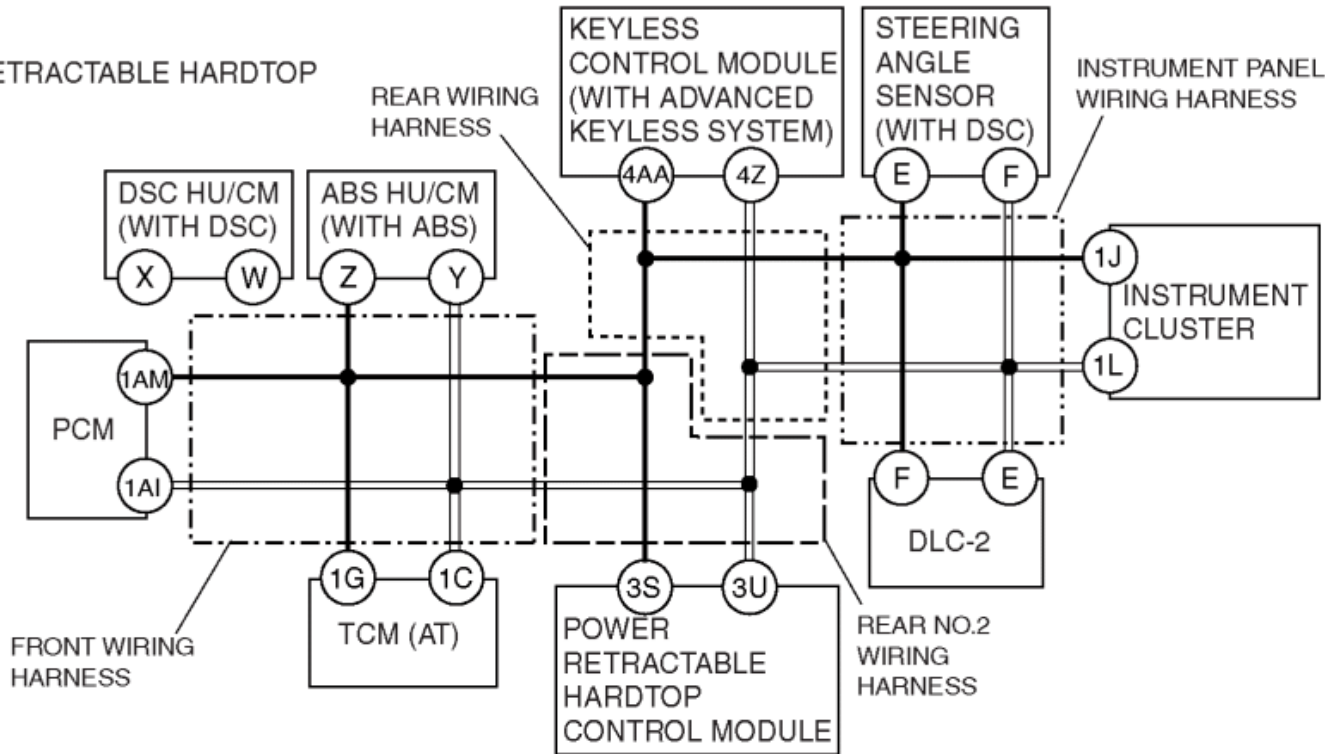
DTC U0073, U2516 [MULTIPLEX COMMUNICATION SYSTEM]

DTC	U0073	<ul style="list-style-type: none"><li>• PCM</li><li>• TCM</li><li>• DSC HU/CM</li><li>• ABS HU/CM</li><li>• Power retractable hardtop control module</li><li>• Keyless control module</li><li>• Instrument cluster</li></ul>	CAN system communication error
	U2516	Steering angle sensor	
DETECTION CONDITION		<p><b>WARNING:</b></p> <ul style="list-style-type: none"><li>• Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only detection conditions may cause injury due to operating error, or damage the system. When performing an inspection, always follow the inspection procedure.</li><li>• CAN system related harness malfunction</li><li>• Related module communication error</li></ul>	
POSSIBLE CAUSE		<ul style="list-style-type: none"><li>• Open or short circuit in wiring harness</li><li>• Malfunction of connectors between PCM, TCM, DSC HU/CM, ABS HU/CM, power retractable hardtop control module, keyless control module, steering angle sensor and instrument cluster</li><li>• PCM malfunction</li><li>• TCM malfunction</li><li>• DSC HU/CM malfunction</li><li>• ABS HU/CM malfunction</li><li>• Power retractable hardtop control module malfunction</li><li>• Keyless control module malfunction</li><li>• Steering angle sensor malfunction</li><li>• Instrument cluster malfunction</li></ul>	

WITHOUT POWER RETRACTABLE HARDTOP



WITH POWER RETRACTABLE HARDTOP



Diagnostic procedure

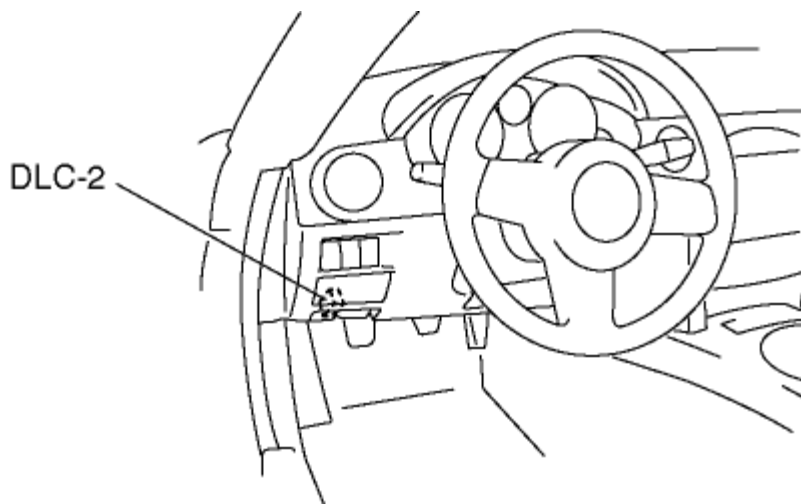
STEP	INSPECTION	ACTION
1	<b>INSPECT CAN SYSTEM-RELATED DTC</b> <ul style="list-style-type: none"><li>Are any DTCs other than the following displayed?<ul style="list-style-type: none"><li>U0073</li><li>U2516</li></ul></li></ul>	YesDetermine malfunctioning part in CAN system.  (See <b>PROCEDURES FOR DETERMINING THE LOCATION OF A MALFUNCTION [MULTIPLEX COMMUNICATION SYSTEM]</b> )
		NoGo to the next step.
2	<b>INSPECT CONNECTOR</b> <ul style="list-style-type: none"><li>Inspect the connector of the</li></ul>	YesGo to the next step.

	module that outputs the DTC. <ul style="list-style-type: none"><li>Is it normal?</li></ul>	No	Repair or replace the connector, then go to Step 4.
3	<b>INSPECT WIRING HARNESSES</b> <ul style="list-style-type: none"><li>Inspect for malfunctions in the following wiring harnesses:<ul style="list-style-type: none"><li>Short to GND</li><li>Short to power supply</li><li>Twisted pair short each other</li><li>Open circuit</li></ul></li><li>Is there any malfunction?</li></ul>	Yes	Repair or replace the wiring harness, then go to the next step.
		No	Go to the next step.
4	<b>VERIFY TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"><li>Make sure to reconnect all disconnected connectors.</li><li>Clear the DTC using the M-MDS.</li><li>Is the same DTC present?</li></ul>	Yes	Replace the module that outputs the DTC, then retry this step.
		No	Troubleshooting completed.

## 2008 - MX-5 - Body and Accessories

### DTC INSPECTION [INSTRUMENT CLUSTER]

1. Connect the M-MDS to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  1. Select "Self Test".
  2. Select "Modules".
  3. Select "IC".
- When using the PDS (Pocket PC)
  1. Select "Module Tests".
  2. Select "IC".
  3. Select "Self Test".

3. Verify the DTC according to the directions on the screen.

- If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.

4. After completion of repairs, clear all DTCs stored in the instrument cluster. (See [CLEARING DTC \[INSTRUMENT CLUSTER\]](#).)

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PID/DATA MONITOR TABLE [INSTRUMENT CLUSTER]

Monitor item	Input-output signal/part name	Unit/State		Terminal
IC_DTC_CNT	Number of continuous DTCs	—		—
IC_ECT	Water temperature gauge	°F	°C	1J, 1L
IC_NUMKEYS	Number of key ID numbers registered with the vehicle	—		—
IC_ODO_CNT	Odometer	m		1J, 1L
IC_SPDMTR	Speedometer	MPH	KPH	
IC_TACHO	Tachometer	RPM		
IC_VPWR	Power supply voltage	V		1C

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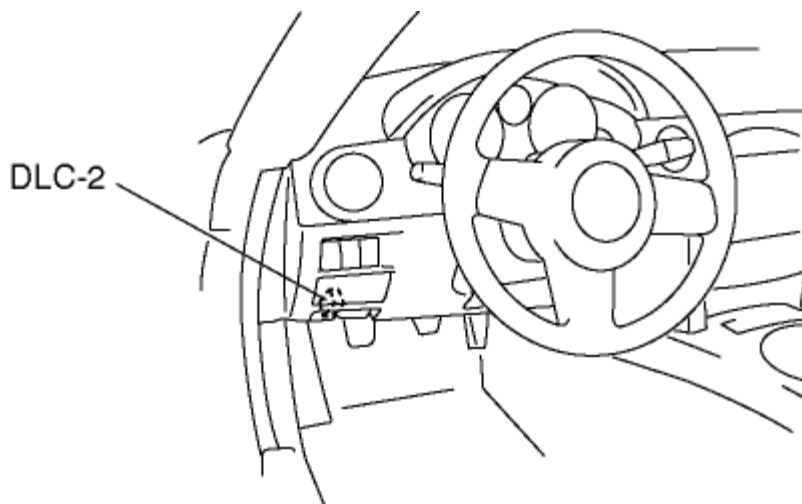
### DTC TABLE [INSTRUMENT CLUSTER]

DTC	Description	Page
B1342	Instrument cluster malfunction	(See <a href="#">DTC B1342 [INSTRUMENT CLUSTER].</a> )
B2143	(See <a href="#">TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS.</a> )	
B2477	Instrument cluster configuration not performed	(See <a href="#">DTC B2477 [INSTRUMENT CLUSTER].</a> )
B2868	(See <a href="#">TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS.</a> )	
B2869	(See <a href="#">TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS.</a> )	
B2870	(See <a href="#">TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS.</a> )	
B2871	(See <a href="#">TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS.</a> )	
U0127	(See <a href="#">TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS.</a> )	
U2616	(See <a href="#">TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS.</a> )	
U2617	(See <a href="#">TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS.</a> )	
U2618	(See <a href="#">TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS.</a> )	
U2619	(See <a href="#">TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS.</a> )	

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### CLEARING DTC [INSTRUMENT CLUSTER]

1. Connect the M-MDS to the DLC 2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  1. Select "Self Test".
  2. Select "Modules".
  3. Select "IC".
- When using the PDS (Pocket PC)
  1. Select "Module Tests".
  2. Select "IC".
  3. Select "Self Test".

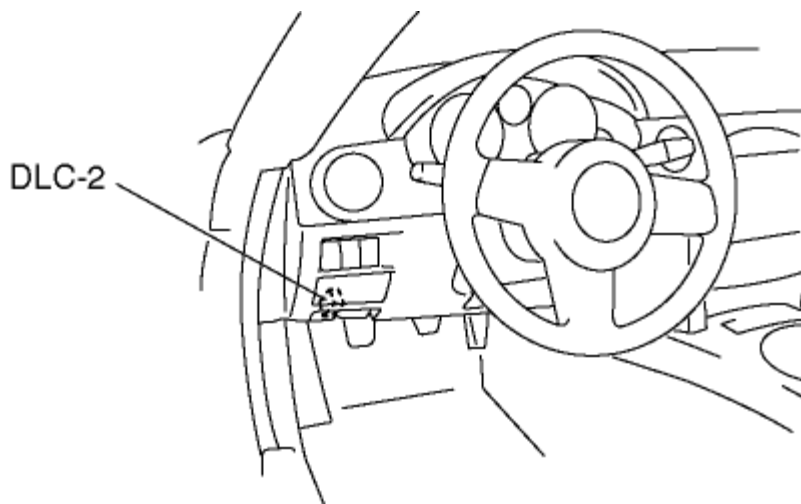
3. Verify the DTC according to the directions on the screen.
4. Press the clear button on the DTC screen to clear the DTC.
5. Verify that no DTCs are displayed.



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### PID/DATA MONITOR INSPECTION [INSTRUMENT CLUSTER]

1. Connect the M-MDS to the DLC 2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  1. Select "DataLogger".
  2. Select "Modules".
  3. Select "IC".
- When using the PDS (Pocket PC)
  1. Select "Module Tests".
  2. Select "IC".
  3. Select "DataLogger".

3. Select the applicable PID from the PID table.
4. Verify the PID data according to the directions on the screen.

#### NOTE:

- The PID data screen function is used for monitoring the calculated value of input/output signals in the module. Therefore, if the monitored value of the output parts is not within the specification, it is necessary to inspect the monitored value of input parts corresponding to the applicable output part control. In addition, because the system does not display an output part malfunction as an abnormality in the monitored value, it is necessary to inspect the output parts individually.



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### DTC B1342 [INSTRUMENT CLUSTER]

DTC B1342	<ul style="list-style-type: none"><li>Instrument cluster malfunction</li></ul>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"><li>Malfunction in the instrument cluster internal circuit</li></ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"><li>Instrument cluster malfunction</li></ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT INSTRUMENT CLUSTER</b>	
	<ul style="list-style-type: none"><li>Clear the DTC from the memory.</li></ul>	Yes Replace the instrument cluster.
	<ul style="list-style-type: none"><li>Turn the ignition switch to the LOCK position.</li><li>Turn the ignition switch to the ON position.</li><li>Is B1342 displayed?</li></ul>	No DTC troubleshooting completed.

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DTC B2477 [INSTRUMENT CLUSTER]

DTC B2477	<ul style="list-style-type: none"><li>Instrument cluster configuration not performed</li></ul>
DETECTION CONDITION	<ul style="list-style-type: none"><li>Configuration write failure is detected. (i.e. instrument cluster is replaced)</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Configuration procedure has not been performed.</li><li>Instrument cluster malfunction</li></ul>

Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>PERFORM INSTRUMENT CLUSTER CONFIGURATION</b> <ul style="list-style-type: none"><li>Perform instrument cluster configuration.</li><li>Is B2477 displayed?</li></ul>	Yes Replace the instrument cluster.
		No Go to the next step.
2	<b>VERIFY TROUBLESHOOTING OF DTC B2477 COMPLETED</b> <ul style="list-style-type: none"><li>Clear the DTC from the memory.</li><li>Is B2477 displayed?</li></ul>	Yes Go to the applicable DTC inspection.
		No DTC troubleshooting completed.

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### DTC TABLE [AUDIO]

Screen display		
DTC (When starting on-board diagnostic test function)	Detection condition	Possible cause/inspection
03: Er01	CD player cannot implement insert and eject commands.	CD player malfunction
03: Er02	Cannot change tracks.	CD player malfunction
03: Er07	CD reading error.	<ul style="list-style-type: none"> <li>Defective CD (scratches or dirt)</li> <li>CD player malfunction</li> </ul>
03: Er10	CD player does not operate.	<ul style="list-style-type: none"> <li>Malfunction of connectors between base unit and CD player</li> <li>CD player malfunction</li> </ul>
05: Er01	CD changer (external) cannot implement insert, eject, and disc change commands.	<ul style="list-style-type: none"> <li>Defective CD (curved, broken or foreign material stuck/attached, etc.)</li> <li>CD changer (external) malfunction</li> </ul>
05: Er07	CD reading error.	<ul style="list-style-type: none"> <li>Defective CD (curved, broken or foreign material stuck/attached, etc.)</li> <li>CD changer (external) malfunction</li> </ul>
	CD changer (external) does not operate.	<ul style="list-style-type: none"> <li>Defective CD (curved, broken or foreign material</li> </ul>

05: Er10		<p>stuck/attached, etc.)</p> <ul style="list-style-type: none"> <li>• CD changer (external) malfunction</li> </ul>
06: Er01	CD changer cannot implement insert, eject, and disc change commands.	<ul style="list-style-type: none"> <li>• Defective CD (curved, broken or foreign material stuck/attached, etc.)</li> <li>• CD changer malfunction</li> </ul>
06: Er02	Cannot change tracks.	<ul style="list-style-type: none"> <li>• Defective CD (curved, broken or foreign material stuck/attached, etc.)</li> <li>• CD changer malfunction</li> </ul>
06: Er07	CD reading error.	<ul style="list-style-type: none"> <li>• Defective CD (curved, broken or foreign material stuck/attached, etc.)</li> <li>• CD changer malfunction</li> </ul>
06: Er10	CD changer does not operate.	<ul style="list-style-type: none"> <li>• Malfunction of connectors between base unit and CD changer</li> <li>• CD changer malfunction</li> </ul>
07: Er01	MD player cannot implement insert and eject commands.	MD player malfunction
07: Er02	Cannot change tracks.	MD player malfunction
07: Er07	MD reading error.	Defective MD
07: Er08	Blank unrecorded MD is inserted.	Defective MD
07: Er10	MD player does not operate.	<ul style="list-style-type: none"> <li>• Malfunction of connectors between base unit and MD player</li> <li>• MD player malfunction</li> </ul>
09: Er20	Audio system does not operate.	Voltage at base unit is low.
09: Er21	Broken sound/No sound	<ul style="list-style-type: none"> <li>• Base unit internal malfunction or base unit protection function operates</li> <li>• Speaker or speaker circuit</li> </ul>

		malfunction
09: Er22	No radio reception	Inspect the radio operation according to vehicle condition.
10: Er01	MP3 applicable CD player cannot implement insert and eject commands.	MP3 applicable CD player malfunction
10: Er02	Cannot change tracks.	MP3 applicable CD player malfunction
10: Er07	MP3 CD reading error.	Incorrect format CD
10: Er10	MP3 applicable CD player does not operate.	<ul style="list-style-type: none"> <li>• Malfunction of connectors between base unit and MP3 applicable CD player</li> <li>• MP3 applicable CD player malfunction</li> </ul>
11: Er01	SSI bus communication error	<ul style="list-style-type: none"> <li>• Poor connection of the connectors</li> <li>• Radio unit malfunction</li> <li>• Sirius unit malfunction</li> </ul>
11: Er03	Poor connection of antenna	<ul style="list-style-type: none"> <li>• Poor connection of antenna connector</li> </ul>
11: Er10	Radio system does not operate.	<ul style="list-style-type: none"> <li>• Malfunction of connectors between base unit and Sirius unit</li> <li>• Sirius unit malfunction</li> </ul>
21: Er17	Incorrect combination (base unit and center panel)	Install the correct base unit or the center panel.
21: Er18		
21: Er19	Communication error between base unit and center panel	Malfunction of connectors between base unit and center panel
22: Er01	MP3 applicable CD changer cannot implement insert, eject, and disc change commands.	<ul style="list-style-type: none"> <li>• Defective CD (curved, broken or foreign material stuck/attached, etc.)</li> <li>• MP3 applicable CD changer malfunction</li> </ul>
	Cannot change tracks.	<ul style="list-style-type: none"> <li>• Defective CD (curved,</li> </ul>

22: Er02		broken or foreign material stuck/attached, etc.) <ul style="list-style-type: none"> <li>• MP3 applicable CD changer malfunction</li> </ul>
22: Er07	CD reading error.	<ul style="list-style-type: none"> <li>• Defective CD (curved, broken or foreign material stuck/attached, etc.)</li> <li>• MP3 applicable CD changer malfunction</li> </ul>
22: Er10	MP3 applicable CD changer does not operate.	<ul style="list-style-type: none"> <li>• Malfunction of connectors between base unit and MP3 applicable CD changer</li> <li>• MP3 applicable CD changer malfunction</li> </ul>
no Err	No DTCs stored	No DTCs stored

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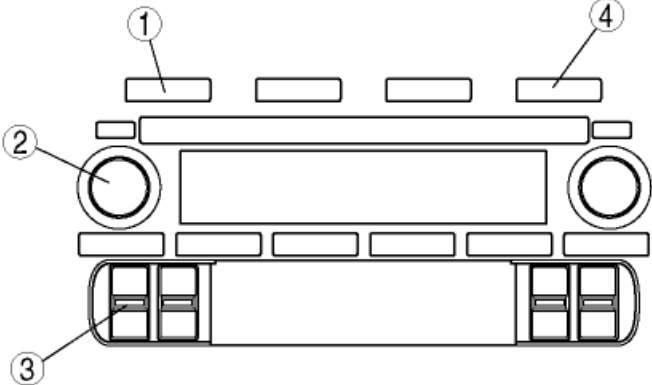
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STARTING PROCEDURE FOR ON-BOARD DIAGNOSTIC TEST MODE [AUDIO]

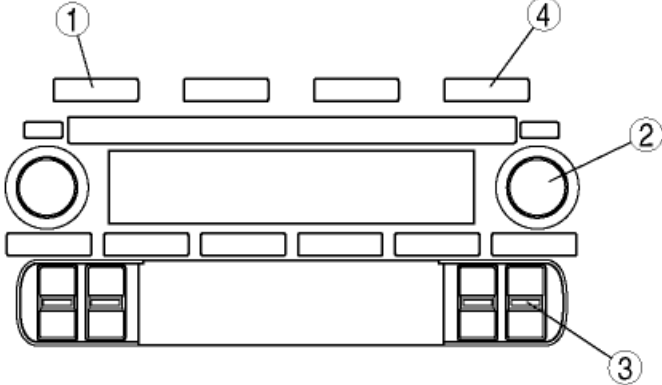
NOTE:

- All DTCs displayed in the on-board diagnostic test mode should be entered in the Audio Repair Order Form.
1. Turn the ignition switch to the ACC or ON position.
  2. Turn the POWER button off.
  3. While pressing the POWER button, simultaneously press the FM/AM button (or FM 1/2 button) and the MEDIA button for **2 s or more**.

TYPE A



TYPE B



1	FM/AM button (Type A)
	FM 1/2 button (Type B)
2	POWER button
3	SEEK switch
4	MEDIA button

NOTE:

- If several DTCs are in the memory, they can be displayed using the SEEK switch.
4. To stop the on-board diagnostic test mode, turn the ignition switch off.

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### SUPPLIER IDENTIFICATION PROCEDURE [AUDIO]

**NOTE:**

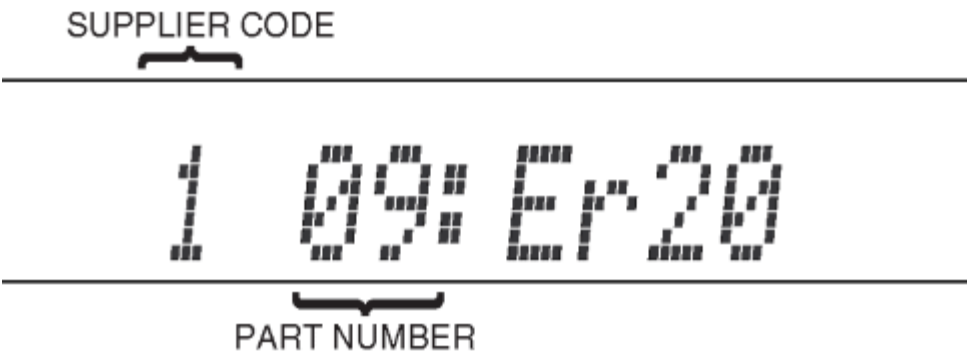
- The supplier can vary with the module. When asking the supplier (service center) for repair or replacement, identify the supplier and fill in the Audio Repair Order Form with the following procedures.

#### Identification Using the Label or Inscribed Lettering

1. Remove the audio unit.
2. Verify the supplier by referring to the label attached to each unit.

#### Identification Using the On-board Diagnostic Test Mode.

1. Start the on-board diagnostic test mode.
2. Identify the device and supplier codes by referring to the information display.



**NOTE:**

- If no DTC is stored, no codes will be displayed.

Supplier code	Supplier name
1	SANYO Automedia
2	Panasonic
3	Clarion

4	Pioneer
---	---------

Part number	Part name
03	CD player
05	CD changer (external)
06	CD changer (upper module)
07	MD player (lower module)
09	Base unit
10	MP3 applicable CD player system
11	Sirius unit
21	Center panel
22	MP3 applicable CD changer (upper module)

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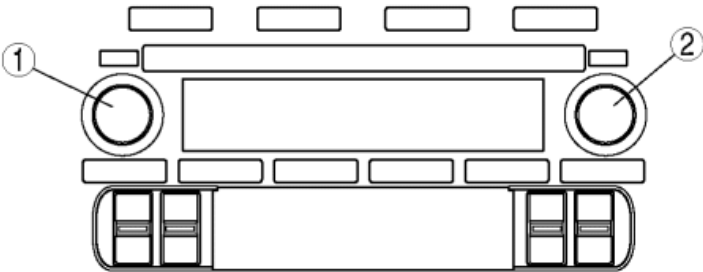
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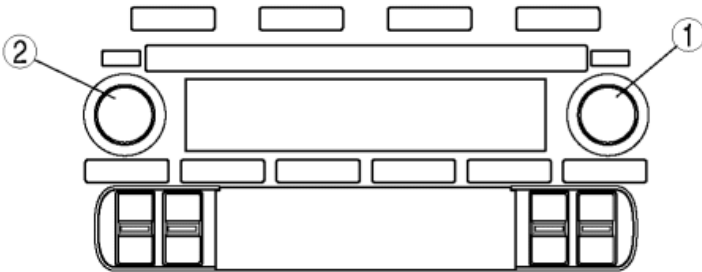
MEMORY CLEARING PROCEDURE [AUDIO]

- 1. Start the on-board diagnostic test mode.
- 2. While pressing the POWER button, simultaneously press the AUDIO CONT button for **2 s or more**.

TYPE A



TYPE B



1	POWER button
2	AUDIO CONT button

CAUTION:

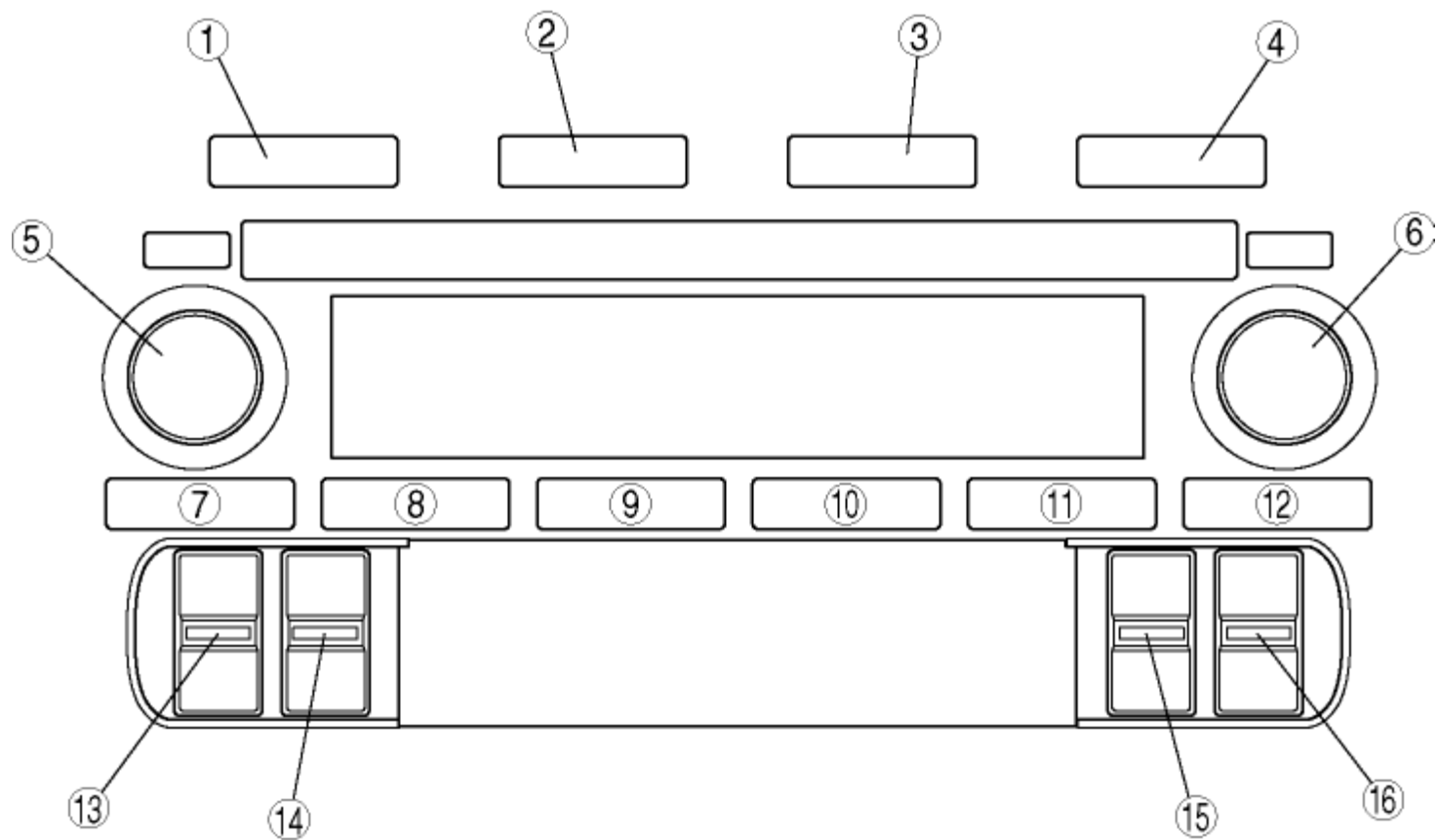
- Before clearing the memory, be sure to enter all of the DTCs displayed in the on-board diagnostic test mode in the Audio Repair Order Form.
3. To stop the on-board diagnostic test mode, turn the ignition switch off.

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DIAGNOSTIC ASSIST FUNCTION [AUDIO]

Structural View

Buttons




No.	Type A	Type B
1	FM/AM button	FM 1/2 button
2	SAT button	AM button
3	CD button	
4	MEDIA button	

5	POWER/VOLUME button	AUDIO CONT/TUNE/TEXT button
6	AUDIO CONT/TUNE/TEXT button	POWER/VOLUME button
7	Preset button 1	
8	Preset button 2	
9	Preset button 3	
10	Preset button 4	
11	Preset button 5	
12	Preset button 6	
13	SEEK switch	Fast-forward/Reverse switch
14	CLOCK switch	
15	SCAN/AUTO-M switch	
16	Fast-forward/Reverse switch	SEEK switch

Information Display Inspection

- With the audio power on, press the POWER button and simultaneously pull up the SEEK switch for **approx. 1s**.
- Inspect according to the following table:

INSPECTION	DISPLAY	ACTION	
Start the information display inspection mode.		The characters displayed on the information display are not truncated or faint.	The information display is normal.
		Except above	Replace the base unit. (See <b>AUDIO UNIT DISASSEMBLY/ASSEMBLY</b> .)

3. Turn the audio off or the ignition switch to the LOCK position to stop the diagnostic assist function.

## Speaker Inspection

1. With the audio power on, press the POWER button and simultaneously press down the SCAN/AUTO-M switch for **approx. 1s**.

2. Inspect according to the following table:

INSPECTION	DISPLAY	ACTION	
<ul style="list-style-type: none"> <li>Start the speaker inspection mode.</li> </ul> <p><b>With Bose</b></p> <ul style="list-style-type: none"> <li>Do all the speakers output sound?</li> </ul> <p><b>Without Bose</b></p> <ul style="list-style-type: none"> <li>Does each speaker output sound in the following order?</li> </ul> <ol style="list-style-type: none"> <li>Front door speaker and tweeter (LH)</li> <li>Front door speaker and tweeter (RH)</li> <li>Rear speaker (LH)</li> <li>Rear speaker (RH)</li> </ol>	—	Yes	Speakers, and wiring harness between the base unit and speakers are normal.
		No	<ul style="list-style-type: none"> <li>Inspect the following parts. <ul style="list-style-type: none"> <li>Malfunctioning speaker</li> <li>Wiring harness between base unit and malfunctioning speaker</li> </ul> </li> </ul>

3. Turn the audio off or the ignition switch to the LOCK position to stop the diagnostic assist function.

Radio Reception Condition Inspection

- 1. With the audio power on and at radio mode, press the POWER button and simultaneously press the Preset 2 button for **approx. 1 s.**
- 2. Inspect according to the following table:

CAUTION:

- Even if the system is normal, radio reception may be difficult depending on where the system is inspected (indoors/outdoors, or conditions at the location). Before inspecting the system, verify that radio reception is adequate.
- When inspecting, select a frequency band (radio station) with the best reception.

INSPECTION	DISPLAY	ACTION
Start the radio reception condition inspection mode.	<div>NORMAL CONDITION</div> <div>S-METER 5</div> <div> </div> <div>S-METER 9</div>	Antenna, antenna feeder and base unit are normal
	<div>S-METER 3</div> <div> </div> <div>S-METER 4</div>	Change the frequency (radio station) and inspect again.
	<div>MALFUNCTION PRESENT</div> <div>S-METER 0</div> <div> </div> <div>S-METER 2</div>	<ul style="list-style-type: none"><li>• Inspect the antenna and antenna feeder.<ul style="list-style-type: none"><li>• If either the antenna or the antenna feeder is not normal, replace the malfunctioning part.</li><li>• If the antenna and antenna feeder are normal, replace the</li></ul></li></ul>



3. Turn the audio off or the ignition switch to the LOCK position to stop the diagnostic assist function.

Audio amplifier (external) inspection (Vehicles with Bose)

1. With the audio power on, press the POWER button and simultaneously pull up the SCAN/AUTO-M switch for **approx. 1 s**.
2. Inspect the audio amplifier (external) according to the following table:

Inspection	Display	Action	
Start audio amplifier inspection mode.	<div>NORMAL</div> <div>AMP-ON</div> <div>AUDIO AMPLIFIER OPERATING SIGNAL IS OUTPUT</div>	Speakers output sound.	System is okay.
		Speakers do not output sound.	Inspect following parts. <ul style="list-style-type: none"><li>Audio amplifier</li><li>Speakers</li><li>Wiring harness (Base unit—audio amplifier)</li></ul>
	<div>MALFUNCTIONING</div> <div>AMP-OFF</div> <div>AUDIO AMPLIFIER OPERATING SIGNAL IS NOT OUTPUT</div>	Replace base unit.	

3. Turn the audio off or the ignition switch to the LOCK position to stop the diagnostic assist function.

Antenna control condition inspection

1. With the audio power on and at radio mode, press the POWER button and simultaneously press the SAT button (Type A)/AM button (Type B) for **approx. 1 s**.

2. Inspect the antenna control conditon according to the following table:

Inspection	Display	Action	
Start antenna control condition inspection mode.	ANT-ON	Sound quality is good.	System is okay.
		Sound quality is poor.	Inspect following parts. <ul style="list-style-type: none"><li>▪ Manual antenna</li><li>▪ Antenna feeder</li></ul>
	ANT-OFF	Replace base unit.	

3. Turn the audio off or the ignition switch to the LOCK position to stop the diagnostic assist function.

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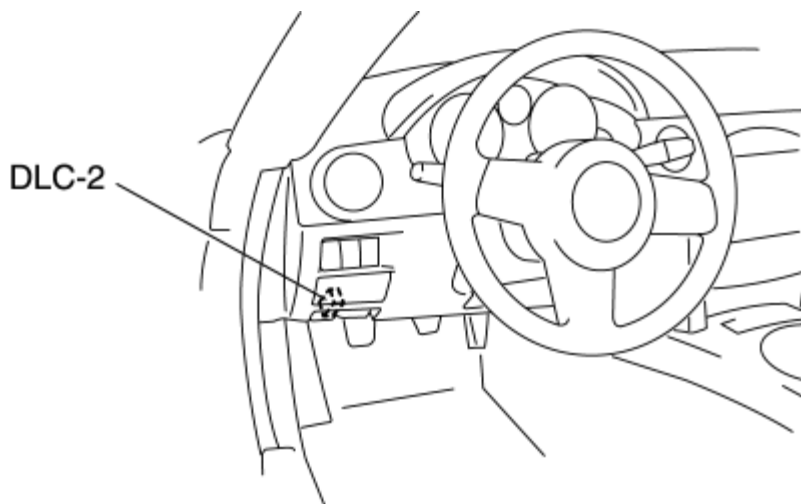
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## 2008 - MX-5 - Body and Accessories

### DTC INSPECTION [POWER RETRACTABLE HARDTOP]

1. Connect the M-MDS to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)

1. Select "Self Test".
2. Select "Modules".
3. Select "RHT".

- When using the PDS (Pocket PC)

1. Select "Module Tests".
2. Select "RHT".
3. Select "Self Test".

3. Verify the DTC according to the directions on the screen.

- If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.

4. After completion of repairs, clear all DTCs stored in the RHT. (See [DTC TABLE \[POWER RETRACTABLE HARDTOP\]](#))

## 2008 - MX-5 - Body and Accessories

### PID/DATA MONITOR TABLE [POWER RETRACTABLE HARDTOP]

**PID/data monitor table**

PID name (definition)	Unit/Operation	Operation Condition (Reference)	Terminal
DTC_CNT (Number of continuous DTCs)	—	<ul style="list-style-type: none"> <li>DTCs detected: 1—255</li> <li>No DTCs detected: 0</li> </ul>	—
VPWR (Module supply voltage)	V	Ignition switch is at ON: B+	1X
VSS (Vehicle speed)	KPH, MPH	<ul style="list-style-type: none"> <li>Vehicle stopped: 0 KPH {0 MPH}</li> <li>Vehicle speed 25 km/h {16 mph}: 25 KPH {16 MPH}</li> </ul>	—
RHT_OP (Power retractable hardtop limit switch (Open position))	On/Off	<ul style="list-style-type: none"> <li>When power retractable hardtop is fully opened (Power retractable hardtop open position switch is on): On</li> <li>Others (Power retractable hardtop open position switch is off): Off</li> </ul>	1T
RHT_CL (Power retractable hardtop limit switch (Close position))	On/Off	<ul style="list-style-type: none"> <li>When power retractable hardtop is fully closed (Power retractable hardtop close position switch is on): On</li> <li>Others (Power retractable hardtop close position switch is off): Off</li> </ul>	1R
DECK_OP (Deck panel limit switch (Open position))	On/Off	<ul style="list-style-type: none"> <li>When deck panel is fully opened (Deck panel open position switch is on): On</li> <li>Others (Deck panel open position switch is off): Off</li> </ul>	3F
DECK_CL (Deck panel limit switch (Close position))	On/Off	<ul style="list-style-type: none"> <li>When deck panel is fully closed (Deck panel close position switch is on): On</li> <li>Others (Deck panel close position switch is off): Off</li> </ul>	3O

SW_OP (Power retractable hardtop open switch)	On/Off	<ul style="list-style-type: none"> <li>When power retractable hardtop open switch is pressed: On</li> <li>When power retractable hardtop open switch is released: Off</li> </ul>	1H
SW_CL (Power retractable hardtop close switch)	On/Off	<ul style="list-style-type: none"> <li>When power retractable hardtop close switch is pressed: On</li> <li>When power retractable hardtop close switch is released: Off</li> </ul>	1H
SW_STRIKER (Top lock switch)	On/Off	<ul style="list-style-type: none"> <li>When top lock is locked: On</li> <li>When top lock is unlocked: Off</li> </ul>	1D
SW_TRUNK (Trunk lid opener switch)	On/Off	<ul style="list-style-type: none"> <li>Trunk lid is open: On</li> <li>Trunk lid is closed: Off</li> </ul>	1F
TR_OP_CTL (Trunk opener control)	On/Off	<ul style="list-style-type: none"> <li>Power retractable hardtop operating (Trunk lid open operation is disabled): On</li> <li>Power retractable hardtop not operated (Trunk lid open operation is enabled): Off</li> </ul>	—
Indicator (Power retractable hardtop indicator light)	On/Off	<ul style="list-style-type: none"> <li>When power retractable hardtop indicator light is illuminated: On</li> <li>When power retractable hardtop indicator light is turned off: Off</li> </ul>	2C

## 2008 - MX-5 - Body and Accessories

### DTC TABLE [POWER RETRACTABLE HARDTOP]

DTC	Description	Page
M-MDS display		
B1342	Power retractable hardtop control module internal malfunction	(See <a href="#">DTC B1342[POWER RETRACTABLE HARDTOP].</a> )
B1317	Battery power supply voltage increases (17.5 V or more)	(See <a href="#">DTC B1317/B1318[POWER RETRACTABLE HARDTOP].</a> )
B1318	Battery power supply voltage decreases (less than 7.5 V )	
B296D	Hall sensor low power supply voltage	(See <a href="#">DTC B296D[POWER RETRACTABLE HARDTOP].</a> )
U0030	Power window communication error (during power retractable hardtop operation)	(See <a href="#">DTC U0030/U0031[POWER RETRACTABLE HARDTOP].</a> )
U0031	Power window communication error (during power retractable hardtop not operation)	
B296A	Roof motor pulse signal error (RH)	(See <a href="#">DTC B296A/U294B/B293C/B293B [POWER RETRACTABLE HARDTOP].</a> )
B294B	Roof motor pulse signal error (LH)	
B293C	Deck panel motor pulse signal error (RH)	
B293B	Deck panel motor pulse signal error (LH)	
B293E	Roof motor circuit malfunction (RH)	(See <a href="#">DTC B293E/B293D/B294C/B293F[POWER RETRACTABLE HARDTOP].</a> )
B293D	Roof motor circuit malfunction (LH)	
B294C	Deck panel motor circuit malfunction (RH)	

B293F	Deck panel motor circuit malfunction (LH)	
B294D	Roof motor opening angle does not match (Pulse count number do not match)	(See <a href="#">DTC B294D/B294E[POWER RETRACTABLE HARDTOP].</a> )
B294E	Deck panel motor opening angle does not match (Pulse count number do not match)	
B294F	Power retractable hardtop/deck panel limit switch malfunction	(See <a href="#">DTC B294F[POWER RETRACTABLE HARDTOP].</a> )
B296B	Top lock switch malfunction	(See <a href="#">DTC B296B[POWER RETRACTABLE HARDTOP].</a> )
B296C	Power retractable hardtop switch malfunction	(See <a href="#">DTC B296C[POWER RETRACTABLE HARDTOP].</a> )
U0073	CAN system communication error	(See <a href="#">DTC TABLE[MULTIPLEX COMMUNICATION SYSTEM].</a> )
U0100	Communication error to PCM	
U0101	Communication error to TCM	
U2197	Vehicle speed signal communication error	

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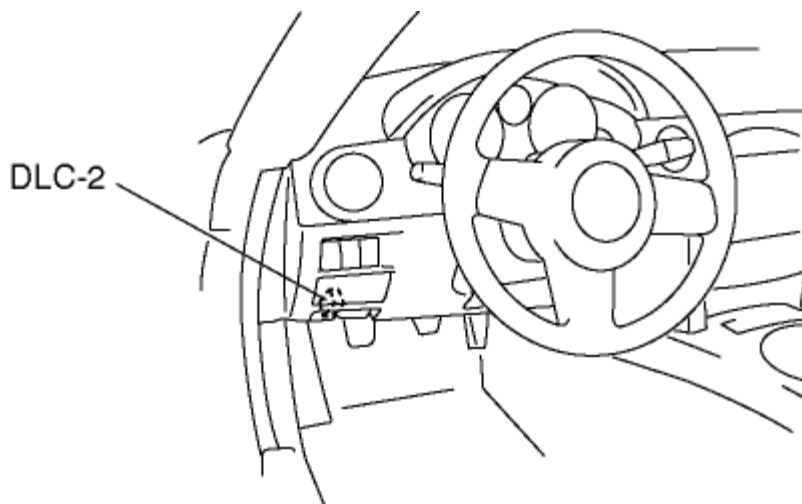
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## 2008 - MX-5 - Body and Accessories

### CLEARING DTC [POWER RETRACTABLE HARDTOP]

1. Connect the M-MDS to the DLC 2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  1. Select "Self Test".
  2. Select "Modules".
  3. Select "RHT".
- When using the PDS (Pocket PC)
  1. Select "Module Tests".
  2. Select "RHT".
  3. Select "Self Test".

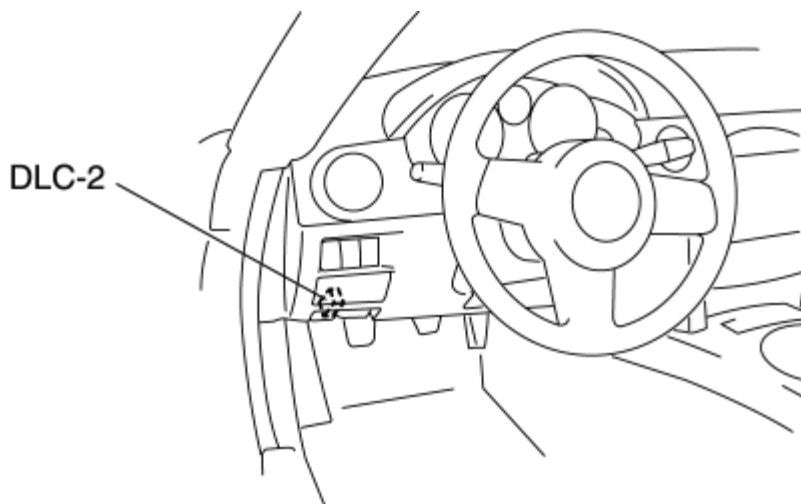
3. Verify the DTC according to the directions on the screen.
4. Press the clear button on the DTC screen to clear the DTC.
5. Verify that no DTCs are displayed.



## 2008 - MX-5 - Body and Accessories

### PID/DATA MONITOR INSPECTION [POWER RETRACTABLE HARDTOP]

1. Connect the M-MDS to the DLC 2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)

1. Select "DataLogger".
2. Select "Modules".
3. Select "RHT".

- When using the PDS (Pocket PC)

1. Select "Module Tests".
2. Select "RHT".
3. Select "DataLogger".

3. Select the applicable PID from the PID table.
4. Verify the PID data according to the directions on the screen.

#### NOTE:

- The PID data screen function is used for monitoring the calculated value of input/output signals in the module. Therefore, if the monitored value of the output parts is not within the specification, it is necessary to inspect the monitored value of input parts corresponding to the applicable output part control. In addition, because the system does not display an output part malfunction as an abnormality in the monitored value, it is necessary to inspect the output parts individually.



## 2008 - MX-5 - Body and Accessories

### DTC B1342 [POWER RETRACTABLE HARDTOP]

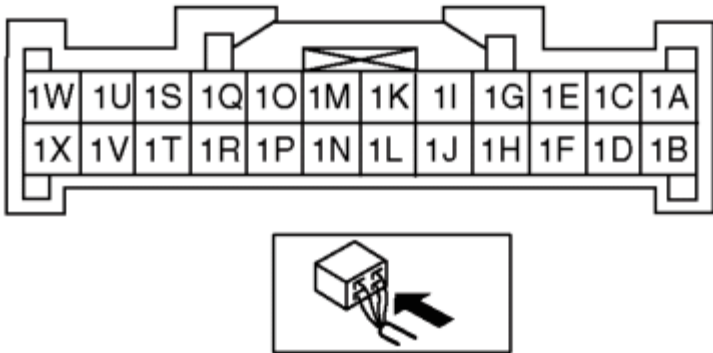
DTC B1342	Power retractable hardtop control module internal malfunction
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"><li>Malfunction in the power retractable hardtop control module internal circuit</li></ul>

#### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT POWER RETRACTABLE HARDTOP CONTROL MODULE</b> <ul style="list-style-type: none"><li>Clear the DTC from the power retractable hardtop control module memory using the M-MDS.</li><li>Turn the ignition switch to the ON position.</li><li>Is the DTC displayed?<ul style="list-style-type: none"><li>B1342</li></ul></li></ul>	Yes Replace the power retractable hardtop control module.  (See <b>POWER RETRACTABLE HARDTOP CONTROL MODULE REMOVAL/INSTALLATION.</b> )
		No DTC troubleshooting completed.

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DTC B1317/B1318 [POWER RETRACTABLE HARDTOP]

DTC	B1317	Battery power supply voltage increases (17.5 V or more)	
	B1318	Battery power supply voltage decreases (less than 7.5 V)	
DETECTION CONDITION	<div><div>NOTE:</div><ul style="list-style-type: none"><li>If the power retractable hardtop control module power supply voltage is not <b>within 7.5–17.5 V</b>.</li><li>The system recovery condition after detecting DTC B1317/1318 is that the battery voltage is in the <b>8.5–16.5 V</b> range. Verify that the battery voltage is <b>8.5–16.5 V</b> when inspecting.</li></ul></div>		
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Open or short circuit in wiring harness between battery and power retractable hardtop control module</li><li>ROOM 15 A fuse malfunction</li><li>Power retractable hardtop control module malfunction</li><li>Battery malfunction</li></ul>		
<div>POWER RETRACTABLE HARDTOP CONTROL MODULE WIRING HARNESS SIDE CONNECTOR</div> <div></div>			

Diagnostic procedure

STEP	INSPECTION	ACTION
	INSPECT FUSE	

1	<ul style="list-style-type: none"> <li>Remove the ROOM 15 A fuse.</li> <li>Is the fuse normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the fuse.
2	<b>INSPECT BATTERY</b> <ul style="list-style-type: none"> <li>Measure the battery positive voltage.</li> <li>Is the voltage <b>8.5 V—16.5 V</b>?</li> </ul>	Yes	Go to the next step.
		No	The battery has a malfunction. Inspect the charge/discharge system.
3	<b>INSPECT WIRING HARNESS BETWEEN BATTERY AND POWER RETRACTABLE HARDTOP CONTROL MODULE</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position.</li> <li>Measure the power retractable hardtop control module terminal 1X voltage.</li> <li>Is the voltage <b>8.5 V—16.5 V</b>?</li> </ul>	Yes	Replace the power retractable hardtop control module.  (See <b>POWER RETRACTABLE HARDTOP CONTROL MODULE REMOVAL/INSTALLATION.</b> )
		No	DTC troubleshooting completed.

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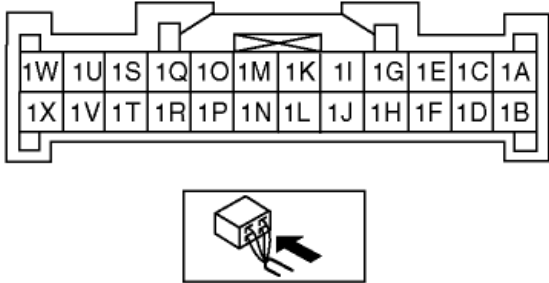
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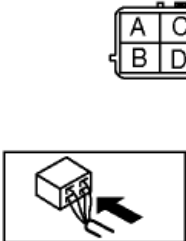
DTC B296D [POWER RETRACTABLE HARDTOP]

DTC B296D	<ul style="list-style-type: none"><li>Hall sensor low power supply voltage</li></ul>
DETECTION CONDITION	<ul style="list-style-type: none"><li>Power supply voltage to the Hall sensor is <b>5 V or less</b>.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Battery malfunction</li><li>Open or short circuit in wiring harness between power retractable hardtop control module and roof/deck panel motor</li><li>Power retractable hardtop control module malfunction</li></ul>

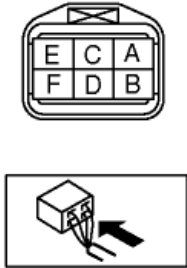
POWER RETRACTABLE HARDTOP CONTROL MODULE WIRING HARNESS SIDE CONNECTOR



ROOF MOTOR WIRING HARNESS SIDE CONNECTOR



DECK PANEL MOTOR WIRING HARNESS SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT THE BATTERY</b> <ul style="list-style-type: none"><li>Measure the battery positive voltage.</li><li>Is the measured voltage <b>7.5 V or more</b>?</li></ul>	YesGo to the next step.
		NoThe battery has a malfunction. Inspect the charge/discharge system.
2	<b>INSPECT THE WIRING HARNESS BETWEEN POWER RETRACTABLE HARDTOP CONTROL MODULE AND ROOF/DECK PANEL MOTOR</b> <ul style="list-style-type: none"><li>Turn the ignition switch to the LOCK position.</li><li>Disconnect the negative battery cable.</li><li>Disconnect the power retractable hardtop control module and roof/deck panel motor connector.</li><li>Inspect for continuity between power retractable hardtop control module connector terminal 1G and following terminals:<ul style="list-style-type: none"><li>Roof motors connector terminal B</li><li>Deck panel motors connector terminal D</li></ul></li><li>Is there continuity?</li></ul>	YesGo to the next step.
		NoRepair or replace the wiring harness.
3	<b>INSPECT THE POWER RETRACTABLE HARDTOP CONTROL MODULE</b> <ul style="list-style-type: none"><li>Connect the negative battery cable.</li></ul>	YesDTC troubleshooting completed.

	<ul style="list-style-type: none"><li>• Turn the ignition switch to the ON position.</li><li>• Push the power retractable hardtop switch.</li><li>• Measure the power retractable hardtop control module connector terminal 1G voltage.</li><li>• Is the measured voltage <b>5.0 V or more?</b></li></ul>	No	Replace the power retractable hardtop control module.  (See <b>POWER RETRACTABLE HARDTOP CONTROL MODULE REMOVAL/INSTALLATION.</b> )
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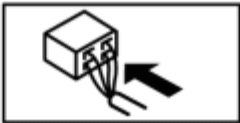
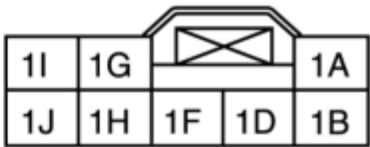
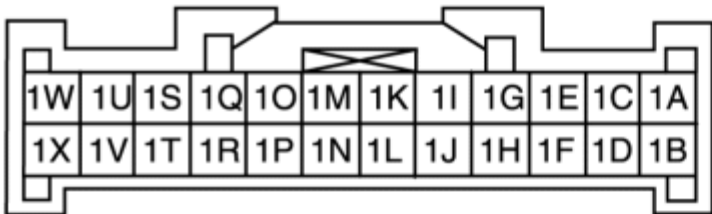
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DTC U0030/U0031 [POWER RETRACTABLE HARDTOP]

DTC	U0030	Power window communication error (during power retractable hardtop operation)
	U0031	Power window communication error (during power retractable hardtop not operation)
DETECTION CONDITION		<ul style="list-style-type: none"><li>• U0030: Open notify signal cannot be received.</li><li>• U0031: Open notify signal is received continuously for <b>30 s or more</b>.</li></ul>
POSSIBLE CAUSE		<ul style="list-style-type: none"><li>• Open or short circuit in wiring harness between power retractable hardtop control module and power window main switch</li><li>• Power retractable hardtop control module malfunction</li><li>• Power window main switch malfunction</li></ul>

POWER RETRACTABLE HARDTOP CONTROL MODULE  
WIRING HARNESS SIDE CONNECTOR

POWER WINDOW MAIN SWITCH  
CONNECTOR



Diagnostic procedure

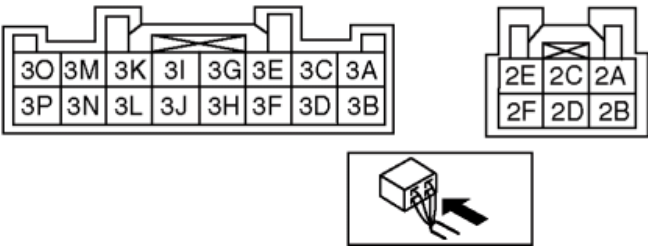
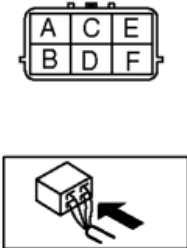
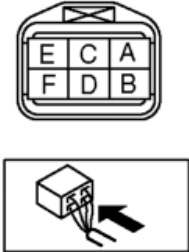
STEP	INSPECTION	ACTION
1	<b>INSPECT POWER WINDOW SYSTEM</b> <ul style="list-style-type: none"><li>• Inspect the power window main switch. (See <b>POWER WINDOW MAIN SWITCH INSPECTION [POWER RETRACTABLE HARDTOP]</b>.)</li><li>• Is the power window main switch normal?</li></ul>	YesGo to the next step.
		NoReplace the power window main switch, then go to next step.



2	<p><b>INSPECT WIRING HARNESS BETWEEN POWER RETRACTABLE HARDTOP CONTROL MODULE AND POWER WINDOW MAIN SWITCH</b></p> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Disconnect the negative battery cable.</li> <li>• Disconnect the power retractable hardtop control module and power window main switch connector.</li> <li>• Inspect for continuity between power retractable hardtop control module connector terminal 1E and power window main switch terminal 1A, and between power retractable hardtop control module connector terminal 1C and power window main switch terminal 1H</li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.
3	<p><b>INSPECT POWER RETRACTABLE HARDTOP CONTROL MODULE</b></p> <ul style="list-style-type: none"> <li>• Connect the negative battery cable.</li> <li>• Clear the DTC from the power retractable hardtop control module memory using the M-MDS.</li> <li>• Turn the ignition switch to the ON position.</li> <li>• Operate the power retractable hardtop.</li> <li>• Is the DTC displayed? <ul style="list-style-type: none"> <li>▪ U0030 or U0031</li> </ul> </li> </ul>	Yes	<p>Replace the power retractable hardtop control module.</p> <p>(See <b>POWER RETRACTABLE HARDTOP CONTROL MODULE REMOVAL/INSTALLATION.</b>)</p>
		No	DTC troubleshooting completed.

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DTC B296A/U294B/B293C/B293B [POWER RETRACTABLE HARDTOP]

DTC	B296A	Roof motor pulse signal error (RH)
	U294B	Roof motor pulse signal error (LH)
	B293C	Deck panel motor pulse signal error (RH)
	B293B	Deck panel motor pulse signal error (LH)
DETECTION CONDITION		<ul style="list-style-type: none"><li>Pulse is not output after the motor drive signal is output.</li></ul>
POSSIBLE CAUSE		<ul style="list-style-type: none"><li>Foreign material caught in mechanism</li><li>RHT L 30 A fuse malfunction</li><li>RHT R 30 A fuse malfunction</li><li>Open or short circuit in wiring harness between roof/deck panel motor and power retractable hardtop control module</li><li>Roof motor malfunction</li><li>Deck panel motor malfunction</li><li>Power retractable hardtop control module malfunction</li></ul>
<div>POWER RETRACTABLE HARDTOP CONTROL MODULE WIRING HARNESS SIDE CONNECTOR</div> <div></div>		
<div>ROOF MOTOR WIRING HARNESS SIDE CONNECTOR</div> <div></div>		
<div>DECK PANEL MOTOR WIRING HARNESS SIDE CONNECTOR</div> <div></div>		

Diagnostic procedure

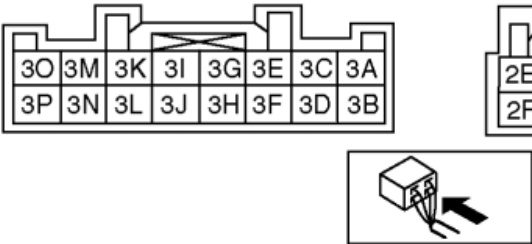
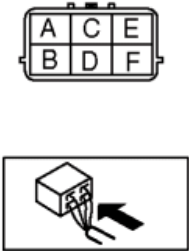
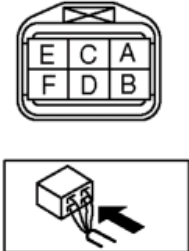
STEP	INSPECTION		ACTION	
1	<b>FOREIGN MATERIAL INSPECTION</b> <ul style="list-style-type: none"><li>Is there any malfunction which stops the motor mechanically?</li></ul>		Yes	Go to the next step.
			No	Remove foreign material.
2	<b>INSPECT FUSE</b> <ul style="list-style-type: none"><li>Remove the RHT L 30 A and RHT R 30 A fuse.</li><li>Is the fuse normal?</li></ul>		Yes	Go to the next step.
			No	Replace the fuse.
	<b>INSPECT THE ROOF/DECK PANEL MOTOR</b>			

3	<ul style="list-style-type: none"> <li>Inspect the roof/deck panel motor. (See <a href="#">ROOF MOTOR INSPECTION.</a>) (See <a href="#">DECK PANEL MOTOR INSPECTION.</a>)</li> <li>Is the roof/deck panel motor normal?</li> </ul>	Yes	Go to the next step.
4	<b>INSPECT THE WIRING HARNESS BETWEEN BATTERY AND POWER RETRACTABLE HARDTOP CONTROL MODULE</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position.</li> <li>Refer to the power retractable hardtop control module inspection and measure the voltage between power retractable hardtop control module connector terminals 2A and 2B. (See <a href="#">POWER RETRACTABLE HARDTOP CONTROL MODULE REMOVAL/INSTALLATION.</a>)</li> <li>Are the terminal voltages normal?</li> </ul>	Yes	Go to the next step.
5	<b>INSPECT THE WIRING HARNESS BETWEEN POWER RETRACTABLE HARDTOP CONTROL MODULE AND GROUND</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the negative battery cable.</li> <li>Disconnect the power retractable hardtop control module connector.</li> <li>Inspect for continuity between power retractable hardtop control module terminal 2E and body ground, and terminal 2F and body ground.</li> <li>Is there continuity?</li> </ul>	Yes	Go to the next step.
6	<b>INSPECT THE WIRING HARNESS BETWEEN ROOF/DECK PANEL MOTOR AND POWER RETRACTABLE HARDTOP CONTROL MODULE</b> <ul style="list-style-type: none"> <li>Disconnect the roof/deck panel motor connector.</li> <li>Disconnect the power retractable hardtop control module connector.</li> <li>Inspect the following wiring harnesses for an open or short circuit. <ul style="list-style-type: none"> <li>Between power retractable hardtop control module connector terminal 3L and roof motor connector (LH) terminal E, and between power retractable hardtop control module connector terminal 3D and roof motor connector (LH) terminal A</li> <li>Between power retractable hardtop control module connector terminal 3A and roof motor connector (RH) terminal E, and between power retractable hardtop control module connector terminal 3I and roof motor connector (RH) terminal A</li> <li>Between power retractable hardtop control module connector terminal 3H and deck panel motor connector (LH) terminal A, and between power retractable hardtop control module connector terminal 3P and deck panel motor connector (LH) terminal E</li> <li>Between power retractable hardtop control module connector terminal 3M and deck panel motor connector (RH) terminal A, and between power retractable hardtop control module connector terminal 3E and deck panel motor connector (RH) terminal E</li> </ul> </li> <li>Is the wiring harness normal?</li> </ul>	Yes	Go to the next step.
7	<b>INSPECT THE WIRING HARNESS BETWEEN ROOF/DECK PANEL MOTOR AND POWER RETRACTABLE HARDTOP CONTROL MODULE</b> <ul style="list-style-type: none"> <li>Disconnect the roof/deck panel motor connector.</li> <li>Disconnect the power retractable hardtop control module connector.</li> <li>Inspect the sensor power supply wiring harness for an open or short circuit.</li> </ul>	Yes	Go to the next step.

	<ul style="list-style-type: none"> <li>Power retractable hardtop control module connector terminal 1G—Roof motor connector (RH) terminal B</li> <li>Power retractable hardtop control module connector terminal 1G—Roof motor connector (LH) terminal B</li> <li>Power retractable hardtop control module connector terminal 1G—Deck panel motor connector (RH) terminal D</li> <li>Power retractable hardtop control module connector terminal 1G—Deck panel motor connector (LH) terminal D</li> </ul> <ul style="list-style-type: none"> <li>Is the wiring harness normal?</li> </ul>		
8	<b>INSPECT THE WIRING HARNESS BETWEEN ROOF/DECK PANEL MOTOR AND POWER RETRACTABLE HARDTOP CONTROL MODULE</b> <ul style="list-style-type: none"> <li>Inspect the sensor communication wiring harness for an open or short circuit. <ul style="list-style-type: none"> <li>Power retractable hardtop control module connector terminal 1I—Roof motor connector (RH) terminal D</li> <li>Power retractable hardtop control module connector terminal 1M—Roof motor connector (LH) terminal D</li> <li>Power retractable hardtop control module connector terminal 1O—Deck panel motor connector (LH) terminal F</li> <li>Power retractable hardtop control module connector terminal 1K—Deck panel motor connector (RH) terminal F</li> </ul> </li> <li>Is the wiring harness normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness.
9	<b>INSPECT THE WIRING HARNESS BETWEEN ROOF/DECK PANEL MOTOR AND POWER RETRACTABLE HARDTOP CONTROL MODULE</b> <ul style="list-style-type: none"> <li>Inspect the sensor ground wiring harness for an open or short circuit. <ul style="list-style-type: none"> <li>Power retractable hardtop control module connector terminal 1Q—Roof motor connector (RH) terminal F</li> <li>Power retractable hardtop control module connector terminal 1Q—Roof motor connector (LH) terminal F</li> <li>Power retractable hardtop control module connector terminal 1Q—Deck panel motor connector (LH) terminal B</li> <li>Power retractable hardtop control module connector terminal 1Q—Deck panel motor connector (RH) terminal B</li> </ul> </li> <li>Is the wiring harness normal?</li> </ul>	Yes	Replace the power retractable hardtop control module.  (See <b>POWER RETRACTABLE HARDTOP CONTROL MODULE REMOVAL/INSTALLATION.</b> )
		No	Repair or replace the wiring harness.

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DTC B293E/B293D/B294C/B293F [POWER RETRACTABLE HARDTOP]

DTC	B293E	Roof motor circuit malfunction (RH)
	B293D	Roof motor circuit malfunction (LH)
	B294C	Deck panel motor circuit malfunction (RH)
	B293F	Deck panel motor circuit malfunction (LH)
DETECTION CONDITION		<ul style="list-style-type: none"><li>Motor circuit malfunction</li></ul>
POSSIBLE CAUSE		<ul style="list-style-type: none"><li>RHT L 30 A fuse malfunction</li><li>RHT R 30 A fuse malfunction</li><li>Open or short circuit in wiring harness between roof/deck panel motor and power retractable hardtop control module</li><li>Roof/deck panel motor malfunction</li><li>Power retractable hardtop control module malfunction</li></ul>
<div>POWER RETRACTABLE HARDTOP CONTROL MODULE WIRING HARNESS SIDE CONNECTOR</div> <div></div>		
<div>ROOF MOTOR WIRING HARNESS SIDE CONNECTOR</div> <div></div>		
<div>DECK PANEL MOTOR WIRING HARNESS SIDE CONNECTOR</div> <div></div>		

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>INSPECT FUSE</b> <ul style="list-style-type: none"><li>Remove the RHT L 30 A and RHT R 30 A fuse.</li><li>Is the fuse normal?</li></ul>	Yes	Go to the next step.
		No	Replace the fuse.
2	<b>INSPECT THE WIRING HARNESS BETWEEN BATTERY AND POWER RETRACTABLE HARDTOP CONTROL MODULE</b> <ul style="list-style-type: none"><li>Turn the ignition switch to the ON position.</li><li>Refer to the power retractable hardtop control module inspection and measure the voltage between power retractable hardtop control module connector terminals 2A and 2B.</li></ul> (See <a href="#">POWER RETRACTABLE HARDTOP CONTROL MODULE INSPECTION</a> .)	Yes	Go to the next step.
		No	Repair or replace the wiring harness.

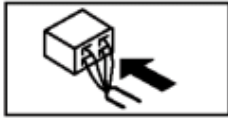
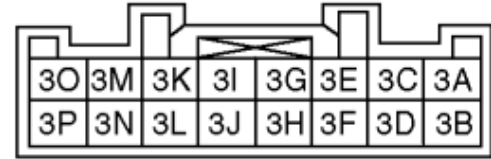
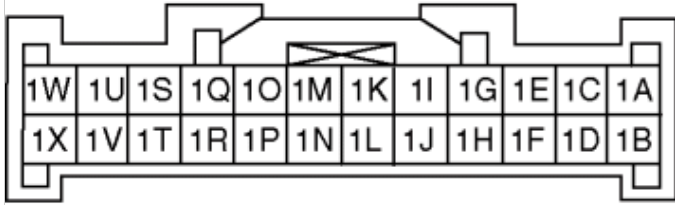
	<ul style="list-style-type: none"><li>• Are the terminal voltages normal?</li></ul>		
3	<b>INSPECT THE WIRING HARNESS BETWEEN POWER RETRACTABLE HARDTOP CONTROL MODULE AND GROUND</b> <ul style="list-style-type: none"><li>• Turn the ignition switch to the LOCK position.</li><li>• Disconnect the negative battery cable.</li><li>• Disconnect the power retractable hardtop control module connector.</li><li>• Inspect for continuity between power retractable hardtop control module terminal 2E and body ground, and terminal 2F and body ground.</li><li>• Is there continuity?</li></ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness.
4	<b>INSPECT THE ROOF/DECK PANEL MOTOR</b> <ul style="list-style-type: none"><li>• Inspect the roof/deck panel motor. (See <a href="#">ROOF MOTOR INSPECTION.</a>) (See <a href="#">DECK PANEL MOTOR INSPECTION.</a>)</li><li>• Is the roof/deck panel motor normal?</li></ul>	Yes	Go to the next step.
		No	Replace the roof/deck panel motor.  (See <a href="#">ROOF MOTOR REMOVAL/INSTALLATION.</a> )  (See <a href="#">DECK PANEL MOTOR REMOVAL/INSTALLATION.</a> )
5	<b>INSPECT THE WIRING HARNESS BETWEEN ROOF/DECK PANEL MOTOR AND POWER RETRACTABLE HARDTOP CONTROL MODULE</b> <ul style="list-style-type: none"><li>• Disconnect the roof/deck panel motor connector.</li><li>• Disconnect the power retractable hardtop control module connector.</li><li>• Inspect the following wiring harnesses for an open or short circuit.<ul style="list-style-type: none"><li>▪ Between power retractable hardtop control module connector terminal 3L and roof motor connector (LH) terminal E, and between power retractable hardtop control module connector terminal 3D and roof motor connector (LH) terminal A</li><li>▪ Between power retractable hardtop control module connector terminal 3A and roof motor connector (RH) terminal E, and between power retractable hardtop control module connector terminal 3I and roof motor connector (RH) terminal A</li><li>▪ Between power retractable hardtop control module connector terminal 3H and deck panel motor connector (LH) terminal A, and between power retractable hardtop control module connector terminal 3P and deck panel motor connector (LH) terminal E</li><li>▪ Between power retractable hardtop control module connector terminal 3M and deck panel motor connector (RH) terminal A, and between power retractable hardtop control module connector terminal 3E and deck panel motor connector (RH) terminal E</li></ul></li><li>• Is the wiring harness normal?</li></ul>	Yes	Replace the power retractable hardtop control module.  (See <a href="#">POWER RETRACTABLE HARDTOP CONTROL MODULE REMOVAL/INSTALLATION.</a> )
		No	Repair or replace the wiring harness.

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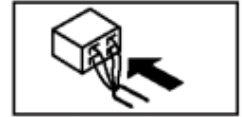
DTC B294D/B294E [POWER RETRACTABLE HARDTOP]

DTC	B294D	Roof motor opening angle does not match (Pulse count number does not match)
	B294E	Deck panel motor opening angle does not match (Pulse count number do not match)
DETECTION CONDITION		<ul style="list-style-type: none"><li>• The left and right pulse count number exceeds a certain level</li></ul>
POSSIBLE CAUSE		<ul style="list-style-type: none"><li>• Foreign material caught in mechanism</li><li>• Damage to the link</li><li>• Open short circuit in wiring harness between roof/deck panel motor and power retractable hardtop control module</li><li>• Roof/deck panel motor malfunction</li></ul>

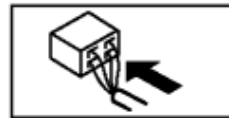
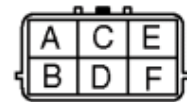
## POWER RETRACTABLE HARDTOP CONTROL MODULE WIRING HARNESS SIDE CONNECTOR



DECK PANEL MOTOR WIRING  
HARNESS SIDE CONNECTOR



ROOF MOTOR WIRING  
HARNESS SIDE CONNECTOR



### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>FOREIGN MATERIAL INSPECTION</b> <ul style="list-style-type: none"> <li>Is there any malfunction which stops the motor mechanically?</li> </ul>	Yes Go to the next step.
		No Remove the foreign material.
2	<b>INSPECT THE ROOF/ROOF MOTOR/DECK PANEL LINK</b> <ul style="list-style-type: none"> <li>Is there any damage to the roof, roof motor, or deck panel link?</li> </ul>	Yes Go to the next step.
		No Replace the middle roof panel or deck panel link. <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>The roof motor link is integrated with the middle roof panel.</li> </ul>



			(See <a href="#">MIDDLE ROOF PANEL REMOVAL/INSTALLATION.</a> )  (See <a href="#">DECK PANEL DISASSEMBLY/ASSEMBLY.</a> )
3	<b>INSPECT THE ROOF/DECK PANEL MOTOR</b> <ul style="list-style-type: none"><li>• Turn the ignition switch to the LOCK position.</li><li>• Disconnect the negative battery cable.</li><li>• Inspect the roof/deck panel motor. (See <a href="#">ROOF MOTOR INSPECTION.</a>) (See <a href="#">DECK PANEL MOTOR INSPECTION.</a>)</li><li>• Is the roof/deck panel motor normal?</li></ul>	Yes	Go to the next step.
		No	Replace the roof/deck panel motor.  (See <a href="#">ROOF MOTOR REMOVAL/INSTALLATION.</a> )  (See <a href="#">DECK PANEL MOTOR REMOVAL/INSTALLATION.</a> )
4	<b>INSPECT THE WIRING HARNESS BETWEEN ROOF/DECK PANEL MOTOR AND POWER RETRACTABLE HARDTOP CONTROL MODULE</b> <ul style="list-style-type: none"><li>• Disconnect the roof/deck panel motor connector.</li><li>• Disconnect the power retractable hardtop control module connector.</li><li>• Inspect the following wiring harnesses for an open or short circuit.<ul style="list-style-type: none"><li>▪ Between power retractable hardtop control module connector terminal 3L and roof motor connector (LH) terminal E, and between power retractable hardtop control module connector terminal 3D and roof motor connector (LH) terminal A</li><li>▪ Between power retractable hardtop control module connector terminal 3A and roof motor connector (RH) terminal E, and between power retractable hardtop control module connector terminal 3I and roof motor connector (RH) terminal A</li><li>▪ Between power retractable hardtop control module connector terminal 3H and deck panel motor connector (LH) terminal A, and between power retractable hardtop control module connector terminal 3P and deck panel motor connector (LH) terminal E</li><li>▪ Between power retractable hardtop control module connector terminal 3M and deck panel motor connector (RH) terminal A, and between power retractable hardtop control module connector terminal 3M and roof motor connector (RH) terminal E</li></ul></li><li>• Is the wiring harness normal?</li></ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness.
5	<b>INSPECT THE WIRING HARNESS BETWEEN ROOF/DECK PANEL MOTOR AND POWER RETRACTABLE HARDTOP CONTROL MODULE</b>	Yes	Go to the next step.

	<p>Inspect the sensor power supply wiring harness for an open or short circuit.</p> <ul style="list-style-type: none"><li>▪ Power retractable hardtop control module connector terminal 1G—Roof motor connector (RH) terminal B</li><li>▪ Power retractable hardtop control module connector terminal 1G—Roof motor connector (LH) terminal B</li><li>▪ Power retractable hardtop control module connector terminal 1G—Deck panel motor connector (RH) terminal D</li><li>▪ Power retractable hardtop control module connector terminal 1G—Deck panel motor connector (LH) terminal D</li></ul> <p>• Is the wiring harness normal?</p>	No	Repair or replace the wiring harness.
6	<p><b>INSPECT THE WIRING HARNESS BETWEEN ROOF/DECK PANEL MOTOR AND POWER RETRACTABLE HARDTOP CONTROL MODULE</b></p> <ul style="list-style-type: none"><li>• Inspect the sensor communication wiring harness for an open or short circuit.<ul style="list-style-type: none"><li>▪ Power retractable hardtop control module connector terminal 1I—Roof motor connector (RH) terminal D</li><li>▪ Power retractable hardtop control module connector terminal 1M—Roof motor connector (LH) terminal D</li><li>▪ Power retractable hardtop control module connector terminal 1O—Deck panel motor connector (LH) terminal F</li><li>▪ Power retractable hardtop control module connector terminal 1K—Deck panel motor connector (RH) terminal F</li></ul></li><li>• Is the wiring harness normal?</li></ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness.
7	<p><b>INSPECT THE WIRING HARNESS BETWEEN ROOF/DECK PANEL MOTOR AND POWER RETRACTABLE HARDTOP CONTROL MODULE</b></p> <ul style="list-style-type: none"><li>• Inspect the sensor ground wiring harness for an open or short circuit.<ul style="list-style-type: none"><li>▪ Power retractable hardtop control module connector terminal 1Q—Roof motor connector (RH) terminal F</li><li>▪ Power retractable hardtop control module connector terminal 1Q—Roof motor connector (LH) terminal F</li><li>▪ Power retractable hardtop control module connector terminal 1Q—Deck panel motor connector (LH) terminal B</li><li>▪ Power retractable hardtop control module</li></ul></li></ul>	Yes	Replace the power retractable hardtop control module. (See <b>POWER RETRACTABLE HARDTOP CONTROL MODULE REMOVAL/INSTALLATION.</b> )
		No	Repair or replace the wiring harness.

	connector terminal 1Q—Deck panel motor connector (RH) terminal B	
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- Is the wiring harness normal?

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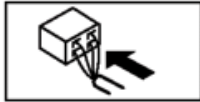
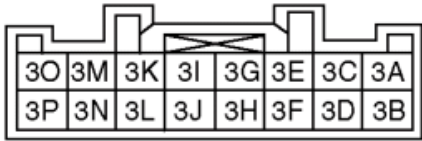
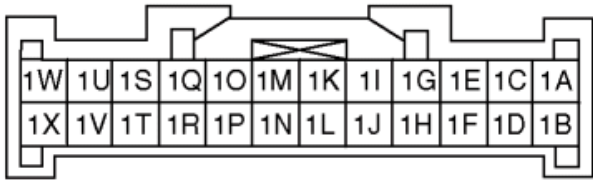
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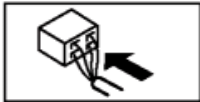
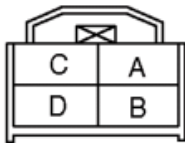
DTC B294F [POWER RETRACTABLE HARDTOP]

DTC B294F	Power retractable hardtop/deck panel limit switch malfunction
DETECTION CONDITION	There is a discrepancy in the signals from each limit switch.
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Foreign material caught in mechanism</li><li>Power retractable hardtop/deck panel limit switch malfunction</li><li>Open or short circuit in wiring harness between power retractable hardtop/deck panel limit switch and power retractable hardtop control module</li></ul>

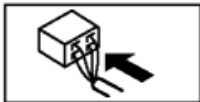
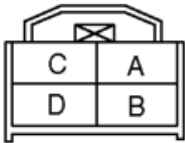
POWER RETRACTABLE HARDTOP CONTROL MODULE  
WIRING HARNESS SIDE CONNECTOR



POWER RETRACTABLE HARDTOP LIMIT  
SWITCH WIRING HARNESS SIDE  
CONNECTOR



DECK PANEL LIMIT SWITCH  
WIRING HARNESS SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>FOREIGN MATERIAL INSPECTION</b> <ul style="list-style-type: none"><li>Is there any malfunction which stops the motor mechanically?</li></ul>	YesGo to the next step.
		No Remove foreign material.

2	<p><b>INSPECT THE POWER RETRACTABLE HARDTOP/DECK PANEL LIMIT SWITCH</b></p> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Disconnect the negative battery cable.</li> <li>• Inspect the power retractable hardtop/deck panel limit switch. (See <a href="#">POWER RETRACTABLE HARDTOP LIMIT SWITCH INSPECTION</a>.) (See <a href="#">DECK PANEL LIMIT SWITCH INSPECTION</a>.)</li> <li>• Is the power retractable hardtop/deck panel limit switch normal?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Replace the power retractable hardtop/deck panel limit switch. (See <a href="#">POWER RETRACTABLE HARDTOP LIMIT SWITCH REMOVAL/INSTALLATION</a>.) (See <a href="#">DECK PANEL LIMIT SWITCH REMOVAL/INSTALLATION</a>.)</p>
3	<p><b>INSPECT THE WIRING HARNESS BETWEEN POWER RETRACTABLE HARDTOP CONTROL MODULE AND POWER RETRACTABLE HARDTOP/DECK PANEL LIMIT SWITCH</b></p> <ul style="list-style-type: none"> <li>• Disconnect the power retractable hardtop/deck panel limit switch connector.</li> <li>• Disconnect the power retractable hardtop control module connector.</li> <li>• Inspect the following wiring harnesses for an open or short circuit. <ul style="list-style-type: none"> <li>▪ Between power retractable hardtop control module connector terminal 1T and power retractable hardtop limit switch connector terminal A, and between power retractable hardtop control module connector terminal 1V and power retractable hardtop limit switch connector terminal B</li> <li>▪ Between power retractable hardtop control module connector terminal 1R— and power retractable hardtop limit switch connector terminal C, and between power retractable hardtop control module connector terminal 1V and power retractable hardtop limit switch connector terminal D</li> <li>▪ Between power retractable hardtop control module connector terminal 3F and deck panel limit switch connector terminal A, and between power retractable hardtop control module connector terminal 1V and deck panel limit switch connector terminal B</li> <li>▪ Between power retractable hardtop control module connector terminal 3O and deck panel limit switch limit switch connector terminal C, and between power retractable hardtop control module connector terminal 1V and deck panel limit switch connector terminal D</li> </ul> </li> <li>• Is the wiring harness normal?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Repair or replace the related wiring harness.</p>
4	<p><b>INSPECT THE LIMIT SWITCH</b></p> <ul style="list-style-type: none"> <li>• Using the M-MDS, verify the following PID/DATA monitor. (See <a href="#">PID/DATA MONITOR TABLE [POWER RETRACTABLE HARDTOP]</a>.) <ul style="list-style-type: none"> <li>▪ RHT_OP</li> <li>▪ RHT_CL</li> <li>▪ DECK_OP</li> <li>▪ DECK_CL</li> </ul> </li> <li>• Are the ON/OFF combinations of the open/close switches as shown in Fig.1? (See <a href="#">Fig.1</a>.)</li> </ul>	<p>Yes Clear the DTC and perform the DTC inspection again.</p> <ul style="list-style-type: none"> <li>• If the malfunction recurs, replace the power retractable hardtop control module.</li> </ul> <p>(See <a href="#">POWER RETRACTABLE HARDTOP CONTROL MODULE REMOVAL/INSTALLATION</a>.)</p>

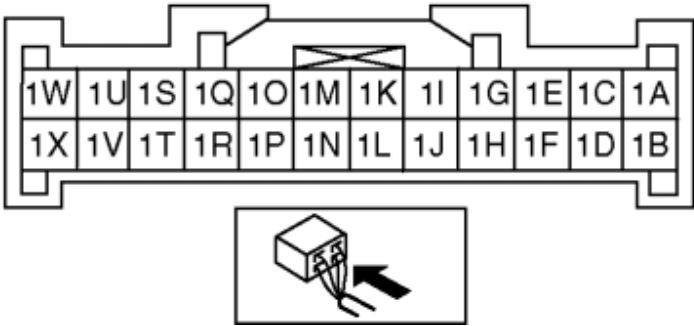
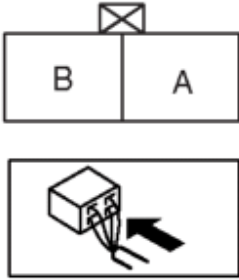
		No	Replace the middle roof panel or deck panel link.  <b>NOTE:</b> <ul style="list-style-type: none"> <li>The roof motor link is integrated with the middle roof panel.</li> </ul> (See <b>MIDDLE ROOF PANEL REMOVAL/INSTALLATION.</b> )  (See <b>DECK PANEL DISASSEMBLY/ASSEMBLY.</b> )
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Fig.1

CONDITION		POWER RETRACTABLE HARDTOP LIMIT SWITCH		DECK PANEL LIMIT SWITCH	
POWER RETRACTABLE HARDTOP	DECK PANEL	POWER RETRACTABLE HARDTOP CLOSE POSITION SWITCH	POWER RETRACTABLE HARDTOP OPEN POSITION SWITCH	DECK PANEL CLOSE POSITION SWITCH	DECK PANEL OPEN POSITION SWITCH
Half open	Half open	OFF	OFF	ON	OFF
Half open	Fully closed	OFF	OFF	OFF	OFF
Half open	Fully open	OFF	OFF	ON	ON
Fully open	Half open	OFF	ON	ON	OFF
Fully closed	Half open	ON	OFF	ON	OFF
Fully open	Fully open	OFF	ON	ON	ON
Fully closed	Fully closed	ON	OFF	OFF	OFF

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DTC B296B [POWER RETRACTABLE HARDTOP]

DTC B296B	Top lock switch malfunction
DETECTION CONDITION	<ul style="list-style-type: none"><li>Top lock switch is detected to be on while the power retractable hardtop is open.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Foreign material caught in mechanism</li><li>Top lock switch malfunction</li><li>Wiring harness between top lock switch and power retractable hardtop control module</li></ul>
<div><div>POWER RETRACTABLE HARDTOP CONTROL MODULE WIRING HARNESS SIDE CONNECTOR</div><div></div></div> <div><div>TOP LOCK SWITCH WIRING HARNESS SIDE CONNECTOR</div><div></div></div>	

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>FOREIGN MATERIAL INSPECTION</b> <ul style="list-style-type: none"><li>Is there any foreign material which turns the switch on mechanically?</li></ul>	Yes	Go to the next step.
		No	Remove foreign material.
2	<b>INSPECT THE TOP LOCK SWITCH</b> <ul style="list-style-type: none"><li>Turn the ignition switch to the LOCK position.</li><li>Disconnect the negative battery cable.</li><li>Inspect the top lock switch. (See <a href="#">TOP LOCK SWITCH</a></li></ul>	Yes	Go to the next step.
		No	Replace the striker. (See <a href="#">CONVERTIBLE TOP</a>

	<b>INSPECTION[ADVANCED KEYLESS SYSTEM].)</b> <ul style="list-style-type: none"><li>Is the top lock switch normal?</li></ul>		<b>DISASSEMBLY/ASSEMBLY.)</b>
3	<b>INSPECT THE WIRING HARNESS BETWEEN POWER RETRACTABLE HARDTOP CONTROL MODULE AND TOP LOCK SWITCH</b> <ul style="list-style-type: none"><li>Disconnect the top lock switch connector.</li><li>Inspect the wiring harness between power retractable hardtop control module terminal connector 1D and top lock switch connector terminal A for a short to ground.</li><li>Is the wiring harness normal?</li></ul>	Yes	Replace the power retractable hardtop control module.  (See <b>POWER RETRACTABLE HARDTOP CONTROL MODULE REMOVAL/INSTALLATION.</b> )
		No	Repair or replace the related wiring harness.

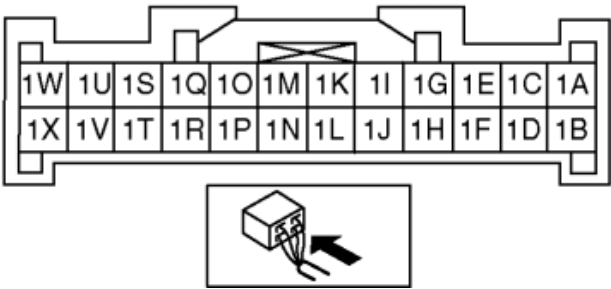


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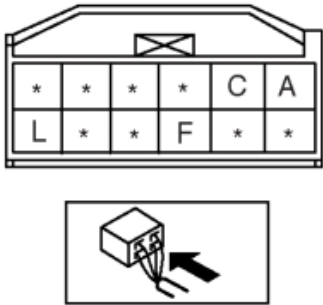
DTC B296C [POWER RETRACTABLE HARDTOP]

DTC B296C	Power retractable hardtop switch malfunction
DETECTION CONDITION	<ul style="list-style-type: none"><li>Power retractable hardtop switch signal is <b>1 V or less</b>.</li><li>Power retractable hardtop switch is detected to be stuck in on.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Open/close signals are input simultaneously for <b>30 s or more</b>.</li><li>Power retractable hardtop switch malfunction</li><li>Open or short circuit in wiring harness between power retractable hardtop switch and power retractable hardtop control module</li><li>Power retractable hardtop control module malfunction</li></ul>

POWER RETRACTABLE HARDTOP CONTROL MODULE  
WIRING HARNESS SIDE CONNECTOR



POWER RETRACTABLE HARDTOP SWITCH  
WIRING HARNESS SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT THE POWER RETRACTABLE HARDTOP SWITCH</b> <ul style="list-style-type: none"><li>Turn the ignition switch to the LOCK position.</li><li>Disconnect the negative battery cable.</li><li>Inspect the power retractable hardtop switch. (See <b>POWER RETRACTABLE HARDTOP SWITCH INSPECTION.</b>)</li><li>Is the power retractable hardtop switch normal?</li></ul>	YesGo to the next step.
		NoReplace the power retractable hardtop switch.  (See <b>POWER RETRACTABLE HARDTOP SWITCH REMOVAL/INSTALLATION.</b> )
2	<b>INSPECT THE WIRING HARNESS BETWEEN POWER RETRACTABLE HARDTOP CONTROL MODULE AND POWER RETRACTABLE HARDTOP SWITCH</b> <ul style="list-style-type: none"><li>Disconnect the power retractable hardtop switch connector.</li><li>Inspect the wiring harness between power retractable hardtop control module connector terminal 1H and power retractable hardtop switch connector terminal F for a short to ground.</li></ul>	YesReplace the power retractable hardtop control module.  (See <b>POWER RETRACTABLE HARDTOP CONTROL MODULE REMOVAL/INSTALLATION.</b> )

- |  |   |  |
|--|---|--|
|  | <ul style="list-style-type: none"><li>• Is the wiring harness normal?</li></ul> | No Repair or replace the related wiring harness. |
|--|---|--|

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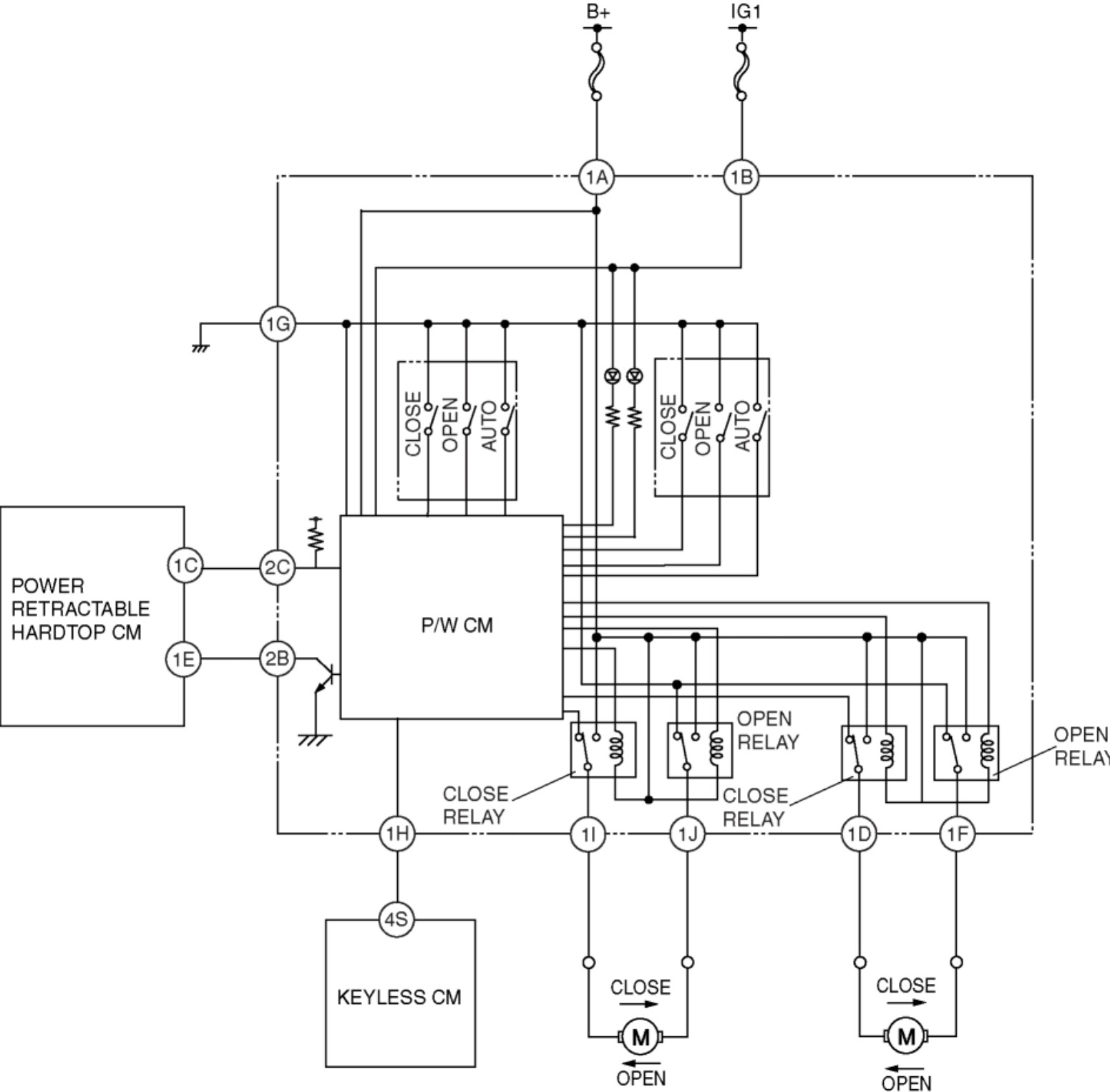
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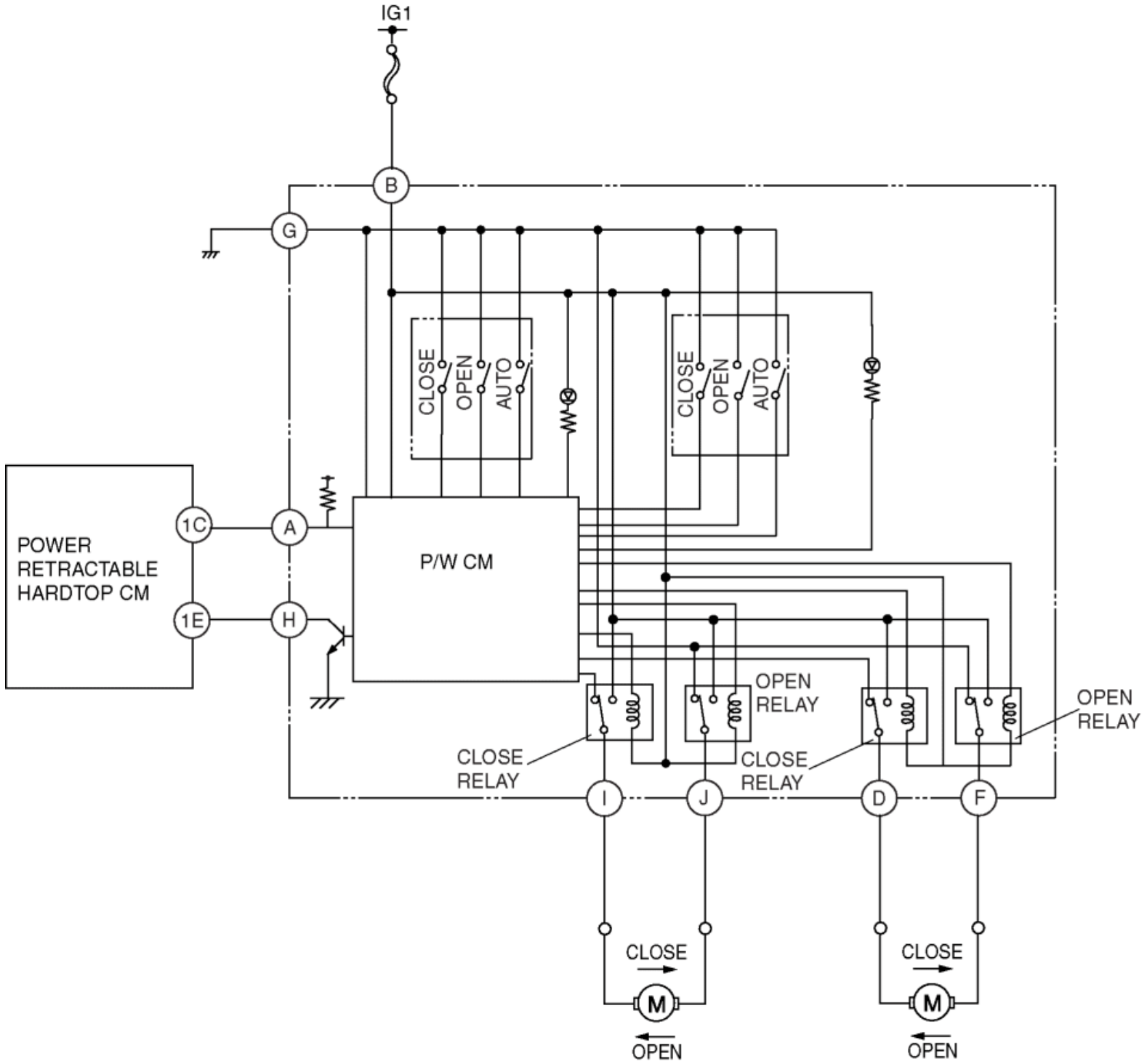
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POWER WINDOW SYSTEM WIRING DIAGRAM [POWER WINDOW SYSTEM]

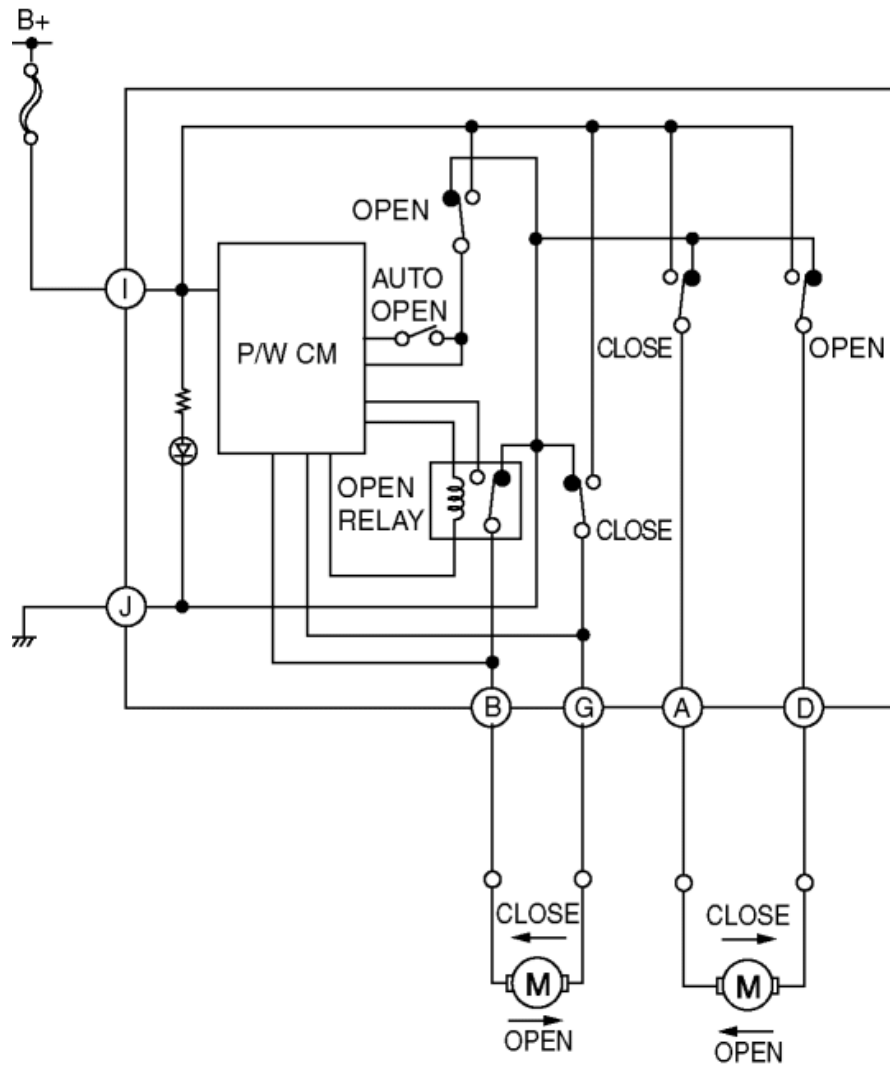
Power Retractable Hardtop Model (with exterior open function)



Power Retractable Hardtop Model (without exterior open function)



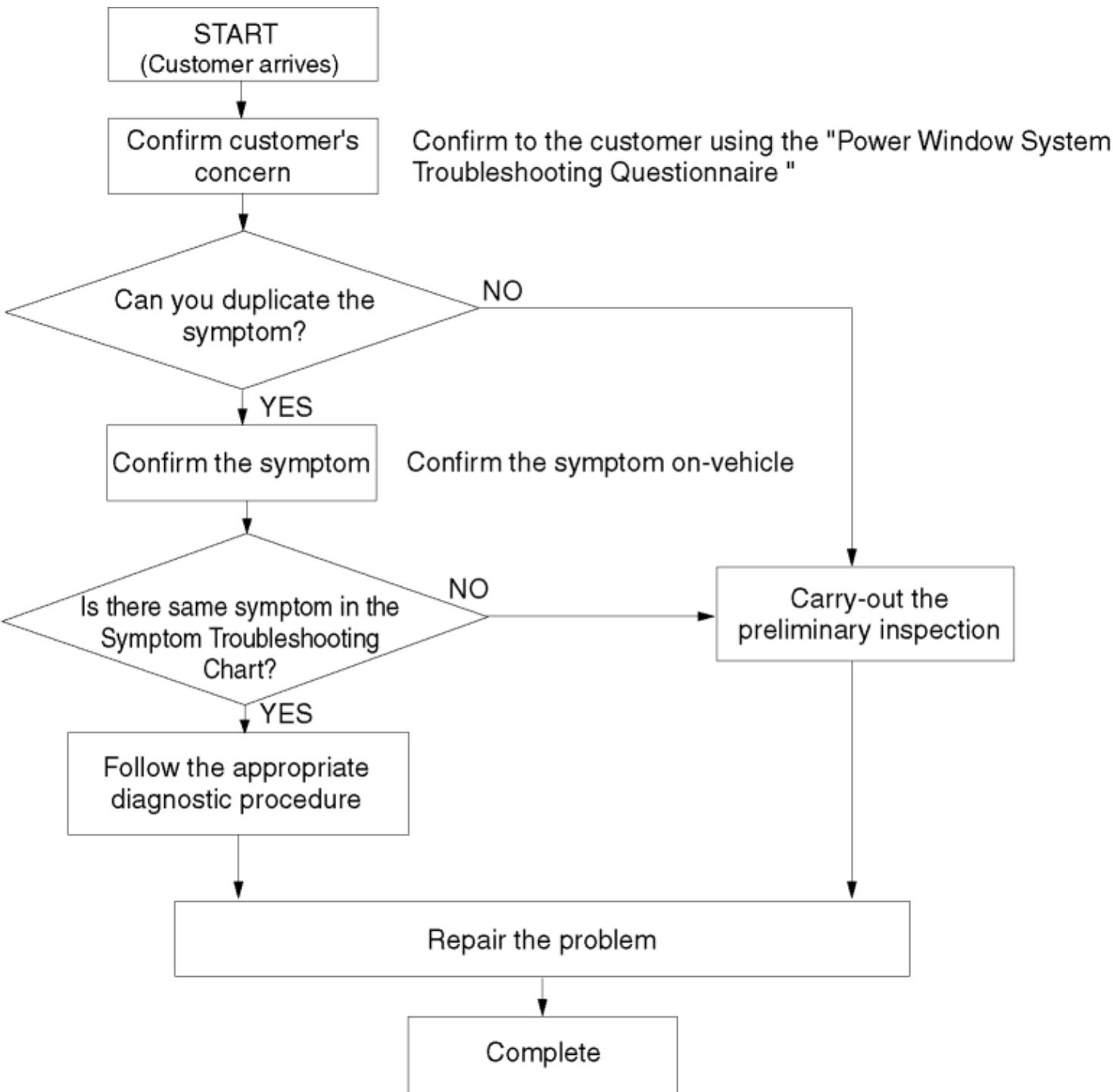
Soft-top Model



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FOREWORD [POWER WINDOW SYSTEM]

Troubleshooting Procedure



- Slightly shake the wiring harness and connectors while performing the inspection to discover

whether poor contact points are the cause of any intermittent malfunctions.

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## 2008 - MX-5 - Body and Accessories

### SYMPTOM TROUBLESHOOTING CHART [POWER WINDOW SYSTEM]

No.	Malfunction symptom
1	<b>No.1 THE AUTO OPEN FUNCTION ON THE DRIVER'S AND PASSENGER'S SIDE POWER WINDOW IS INOPERATIVE[POWER WINDOW SYSTEM]</b>
2	<b>No.2 THE DRIVER'S SIDE POWER WINDOW IS INOPERATIVE[POWER WINDOW SYSTEM]</b>
3	<b>No.3 THE PASSENGER'S SIDE POWER WINDOW IS INOPERATIVE[POWER WINDOW SYSTEM]</b>
4	<b>No.4 ALL POWER WINDOWS ARE INOPERATIVE[POWER WINDOW SYSTEM]</b>
5	<b>No.5 ABNORMAL NOISE WHILE THE DOOR GLASS IS OPENING OR CLOSING[POWER WINDOW SYSTEM]</b>

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## 2008 - MX-5 - Body and Accessories

### No.2 THE DRIVER'S SIDE POWER WINDOW IS INOPERATIVE [POWER WINDOW SYSTEM]

2	The driver's side power window is inoperative.
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>Power supply circuit or ground circuit malfunction <ul style="list-style-type: none"> <li>Burnt fuse (<b>B+</b>)</li> <li>Open or short circuit in wiring harness between fuse (<b>B+</b>) and power window main switch</li> <li>Open or short circuit in wiring harness between power window main switch and power window motor</li> <li>Open or short circuit in wiring harness between power window main switch and ground</li> </ul> </li> <li>Power window main switch malfunction</li> <li>Power window motor malfunction</li> <li>Power window regulator malfunction</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION	ACTION
1	• Turn the ignition switch to the ON position.	Yes Go to step 6.
	• Does the LED on the power window main switch illuminate?	No Go to the next step.
2	• Operate the passenger's side power window using the power window main switch.	Yes Go to the next step.
	• Does the power window operate properly?	No Inspect for an open or short circuit in the following wiring harnesses. Inspect the connector connections (damage/pulled-out pins, corrosion): <ul style="list-style-type: none"> <li>P.WIND 20 A fuse—Power window main switch terminal 1B (power retractable</li> </ul>

			<p>hardtop model)/I (soft-top model)</p> <ul style="list-style-type: none"><li>• Power window main switch terminal 1G (power retractable hardtop model)/terminal J (soft-top model)—ground.</li></ul> <p>Repair or replace if necessary.</p>
3	<ul style="list-style-type: none"><li>• Is the P.WIND 20 A fuse normal?</li></ul>	Yes	<p>Go to step 5. (power retractable hardtop model with exterior open function)</p> <p>Replace the power window main switch.</p> <p>(See <b>POWER WINDOW MAIN SWITCH REMOVAL/INSTALLATION.</b>)</p> <p>(power retractable hardtop model without exterior open function/soft-top model)</p>
		No	<p>Inspect the following:</p> <ul style="list-style-type: none"><li>• Short circuit in <b>B+</b> power supply wiring harness</li><li>• Short circuit in power window motor</li></ul> <p>Repair or replace if necessary.</p> <p>Replace with the appropriate standard fuse.</p> <p>Then, go to the next step.</p>
4	<ul style="list-style-type: none"><li>• Operate the power window system.</li><li>• Do the power windows operate properly?</li></ul>	Yes	<p>Troubleshooting is completed.</p>
		No	<p>Re-confirm the symptom and go to step 1.</p>
5	<ul style="list-style-type: none"><li>• Measure the voltage at the power window main switch terminal 1A.</li><li>• Is the voltage <b>B+</b>?</li></ul>	Yes	<p>Replace the power window main switch.</p> <p>(See <b>POWER WINDOW MAIN SWITCH REMOVAL/INSTALLATION.</b>)</p>
		No	<p>Inspect for an open or short circuit in the power window main switch wiring</p>

			<p>harness (battery power supply).</p> <p>Inspect the power window main switch connector connection. (damage/pulled-out pins, corrosion)</p> <p>Repair or replace if necessary.</p>
6	<ul style="list-style-type: none"> <li>Measure the voltage at the power window main switch. (power window motor output terminal) while operating the power window using the power window main switch.</li> <li>Is the voltage <b>B+</b>?</li> </ul> <p><b>Power retractable hardtop model:</b></p> <ul style="list-style-type: none"> <li>Open: terminal 1J/close: terminal 1I</li> </ul> <p><b>Soft-top model:</b></p> <ul style="list-style-type: none"> <li>Open: terminal B/close: terminal G</li> </ul>	Yes	Go to the next step.
		No	<p>Replace the power window main switch.</p> <p>(See <b>POWER WINDOW MAIN SWITCH REMOVAL/INSTALLATION.</b>)</p>
7	<ul style="list-style-type: none"> <li>Measure the voltage at the power window motor. (battery power supply terminal) while operating the power window using the power window main switch.</li> <li>Is the voltage <b>B+</b>?</li> </ul> <p>(Open: terminal A/close: terminal G)</p>	Yes	Go to the next step.
		No	<p>Inspect for an open or short circuit in the wiring harness between the power window main switch and the power window motor.</p> <p>Inspect the power window main switch and power window motor connector connections. (damage/pulled-out pins, corrosion)</p> <p>Repair or replace if necessary.</p>
8	<ul style="list-style-type: none"> <li>Operate the driver's side power window using the power window main switch.</li> <li>Does the power window motor operate (rotate)?</li> </ul> <p><b>CAUTION:</b></p> <ul style="list-style-type: none"> <li>If the power window motor temperature is high, the motor may not rotate due to the motor internal bimetal function. Leave it untouched for about 3 min to cool it down, then reinspect.</li> </ul>	Yes	Go to the next step.
		No	<p>Replace the power window motor.</p> <p>(See <b>POWER WINDOW REGULATOR REMOVAL/INSTALLATION.</b>)</p>
9	<ul style="list-style-type: none"> <li>Remove the door glass from the carrier plate.</li> </ul>	Yes	Replace the power window regulator.

	<ul style="list-style-type: none"><li>• Make sure that the door glass moves smoothly using your hand.</li><li>• Does the door glass move smoothly?</li></ul>		(See <b>POWER WINDOW REGULATOR REMOVAL/INSTALLATION.</b> )
		No	Inspect for a bent regulator guide or other possible malfunction. If normal, replace the door glass run-channel.

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## 2008 - MX-5 - Body and Accessories

### POWER WINDOW SYSTEM PRELIMINARY INSPECTION [POWER WINDOW SYSTEM]

#### Manual Open/close Function Inspection

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position.</li> <li>Operate the driver-side power window using the manual open/close function on the power window main switch.</li> <li>Does the driver-side power window operate properly?</li> </ul>	YesGo to the next step.
		No <ul style="list-style-type: none"> <li>Inspect the following items:               <ul style="list-style-type: none"> <li>Power window main switch power supply fuse</li> <li>Power window main switch ground wiring harness</li> <li>Power window main switch power supply wiring harness</li> <li>Wiring harness between power window main switch and driver-side power window motor</li> <li>Power window main switch (driver-side power window control is malfunctioning)</li> <li>Driver-side power window motor</li> </ul> </li> </ul>

			Repair or replace the malfunctioning part, then go to the next step.
2	<ul style="list-style-type: none"> <li>Operate the passenger-side power window using the power window main switch.</li> <li>Does the passenger-side power window operate properly?</li> </ul>	Yes	<ul style="list-style-type: none"> <li>Manual open/close function is normal.</li> <li>Perform the auto open/close function inspection.</li> </ul>
		No	<ul style="list-style-type: none"> <li>Inspect the following items: <ul style="list-style-type: none"> <li>Wiring harness between power window main switch and passenger-side power window motor</li> <li>Power window main switch (passenger-side power window control is malfunctioning)</li> <li>Passenger-side power window motor</li> </ul> </li> <li>Repair or replace the malfunctioning part, then go to the next step.</li> </ul>

## Auto Open Function Inspection

### NOTE:

- The soft-top models do not have passenger's side power window auto open function.

STEP	INSPECTION	ACTION	
1	<ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position.</li> <li>Operate the driver-side and passenger-side power window using the auto open function on the driver-side and passenger-side</li> </ul>	Yes	Go to the next step.
		No	<ul style="list-style-type: none"> <li>Go to <b>No.1 THE AUTO OPEN FUNCTION ON THE DRIVER'S AND PASSENGER'S SIDE POWER WINDOW IS</b></li> </ul>

	power window main switch. <ul style="list-style-type: none"><li>• Do each power window operate properly?</li></ul>		<b>INOPERATIVE[POWER WINDOW SYSTEM] .</b>
2	<ul style="list-style-type: none"><li>• Operate the power window main switch to the close position while the power window is opening.</li><li>• Does the power window operation stop?</li></ul>	Yes	<ul style="list-style-type: none"><li>• Auto open function is normal.</li></ul>
		No	<ul style="list-style-type: none"><li>• Replace the power window main switch (power window control unit is malfunctioning.)</li></ul>

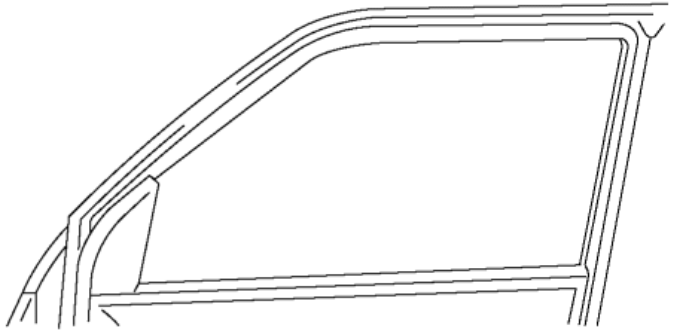
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### POWER WINDOW SYSTEM TROUBLESHOOTING QUESTIONNAIRE [POWER WINDOW SYSTEM]



Date :

When did the malfunction first occur ?			
Weather conditions	<input type="checkbox"/> Fair weather <input type="checkbox"/> Cloudy <input type="checkbox"/> Rain <input type="checkbox"/> Snow <input type="checkbox"/> Other (            )	Outside temperature	Approx. °F
Driving conditions	<input type="checkbox"/> Driving <input type="checkbox"/> Stopped (Engine is : <input type="checkbox"/> Running <input type="checkbox"/> Stopped)		
Duplicate symptom?	<input type="checkbox"/> YES <input type="checkbox"/> NO	Frequency	<input type="checkbox"/> Always <input type="checkbox"/> Sometimes (        times/month)
Road conditions	<input type="checkbox"/> City <input type="checkbox"/> Outer city <input type="checkbox"/> Freeway <input type="checkbox"/> Other (            ) / <input type="checkbox"/> Paved <input type="checkbox"/> Dirt road		
*Follow the appropriate diagnostic procedures shown below or perform the basic troubleshooting flow.			
<input type="checkbox"/> (No.1) The auto open function on the driver's and passenger's side power window inoperative.			
<input type="checkbox"/> (No.2) The driver's side power window is inoperative.			
<input type="checkbox"/> (No.3) The passenger's side power window is inoperative.			
<input type="checkbox"/> (No.4) All power windows are inoperative.			
<input type="checkbox"/> (No.5) Abnormal noise while the door glass is opening or closing.			
<input type="checkbox"/> Other (Describe the symptom below if the symptom does not appear in the above list.)			
			
Please describe the conditions when the malfunction occurs. (Example) : When the outer mirrors are operated			
Please describe the conditions under which the system returns to normal operation after malfunctioning. (Example) : The ignition switch is turned to the ON position after inserting the ignition key into the key cylinder			



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### No.1 THE AUTO OPEN FUNCTION ON THE DRIVER'S AND PASSENGER'S SIDE POWER WINDOW IS INOPERATIVE [POWER WINDOW SYSTEM]

1	The auto open function on the driver's and passenger's side power window is inoperative.
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>• No power supply to power window main switch</li> <li>• Power window main switch malfunction (power window control unit malfunction, auto switch malfunction)</li> <li>• Power window motor malfunction</li> <li>• Malfunction in wiring harness between power window motor and power window main switch</li> </ul>

**NOTE:**

- The soft-top models do not have passenger's side power window auto open function.

#### Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<ul style="list-style-type: none"> <li>• Turn the ignition switch to ON position.</li> <li>• Operate driver and passenger side power window using automatic open function on the power window main switch.</li> <li>• Do each side power window open normally?</li> </ul>	Yes	The power window system is normal.
		No	<p><b>Automatic open function does not operate both sides:</b></p> <ul style="list-style-type: none"> <li>• Go to the next step.</li> </ul> <p><b>Automatic open function does not operate one side:</b></p> <ul style="list-style-type: none"> <li>• Go to step 4.</li> </ul>
2	<ul style="list-style-type: none"> <li>• Turn the ignition switch to ON position.</li> <li>• Measure the voltage between power window main switch following terminal and ground.</li> </ul>	Yes	Go to the next step.
		No	Repair or replace for open circuit.

	<ul style="list-style-type: none"> <li>▪ Terminal 1B (power retractable hardtop model)</li> <li>▪ Terminal I (soft-top model)</li> </ul> <ul style="list-style-type: none"> <li>• Is the voltage <b>B+</b>?</li> </ul>		
3	<ul style="list-style-type: none"> <li>• Turn the ignition switch to LOCK position.</li> <li>• Disconnect the power window main switch connector.</li> <li>• Verify that the continuity between following power window main switch terminal and ground. <ul style="list-style-type: none"> <li>▪ Terminal 1G (power retractable hardtop model)</li> <li>▪ Terminal J (soft-top model)</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes	Inspect the power window main switch.  (See <b>POWER WINDOW MAIN SWITCH INSPECTION</b> .)  (See <b>POWER WINDOW MAIN SWITCH INSPECTION[POWER RETRACTABLE HARDTOP]</b> .)  Replace the power window main switch if necessary.
		No	Repair or replace for open circuit.
4	<ul style="list-style-type: none"> <li>• Turn the ignition switch to ON position.</li> <li>• Operate suspected side power window using manual open function on the power window main switch.</li> <li>• Do suspected side power window open normally?</li> </ul>	Yes	Replace the power window main switch. (power window control unit malfunction)  (See <b>POWER WINDOW MAIN SWITCH REMOVAL/INSTALLATION</b> .)
		No	Go to the next step.
5	<ul style="list-style-type: none"> <li>• Turn the ignition switch to LOCK position.</li> <li>• Disconnect the power window main switch and suspected side power window motor connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion etc.)</li> <li>• Is there any malfunction?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace malfunctioning part.
6	<ul style="list-style-type: none"> <li>• Inspect for open or short circuit in wiring harness between suspected side power window motor and power window main switch.</li> </ul> <p><b>Power retractable hardtop model driver's side:</b></p>	Yes	Repair or replace for open or short circuit.
		No	Go to the next step.

	<ul style="list-style-type: none"> <li>Terminal 1I (main switch)—terminal G (motor)</li> <li>Terminal 1J (main switch)—terminal A (motor)</li> </ul> <p><b>Power retractable hardtop model passenger's side:</b></p> <ul style="list-style-type: none"> <li>Terminal 1D (main switch)—terminal G (motor)</li> <li>Terminal 1F (main switch)—terminal A (motor)</li> </ul> <p><b>Soft-top model driver's side:</b></p> <ul style="list-style-type: none"> <li>Terminal G (main switch)—terminal G (motor)</li> <li>Terminal B (main switch)—terminal A (motor)</li> </ul> <p><b>Soft-top model passenger's side:</b></p> <ul style="list-style-type: none"> <li>Terminal A (main switch)—terminal G (motor)</li> <li>Terminal D (main switch)—terminal A (motor)</li> </ul> <ul style="list-style-type: none"> <li>Is the open or short circuit detected?</li> </ul>		
7	<ul style="list-style-type: none"> <li>Inspect suspected side power window motor. (See <b>POWER WINDOW MOTOR INSPECTION.</b>)</li> <li>Is the power window motor normal?</li> </ul>	Yes	Replace the power window main switch. (power window control unit malfunction, auto switch malfunction)  (See <b>POWER WINDOW MAIN SWITCH REMOVAL/INSTALLATION.</b> )
		No	Replace the power window motor.  (See <b>POWER WINDOW REGULATOR REMOVAL/INSTALLATION.</b> )



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### No.3 THE PASSENGER'S SIDE POWER WINDOW IS INOPERATIVE [POWER WINDOW SYSTEM]

3	The passenger's side power window is inoperative.
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>Power supply circuit malfunction <ul style="list-style-type: none"> <li>Open or short circuit in wiring harness between power window main switch and passenger's side power window motor</li> </ul> </li> <li>Power window main switch malfunction</li> <li>The passenger's side power window motor malfunction</li> <li>The passenger's side power window regulator malfunction</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position.</li> <li>Operate the driver's side power window using the power window main switch.</li> <li>Does the power window operate properly?</li> </ul>	Yes Go to the next step.
		No Go to the symptom "No.4 ALL POWER WINDOWS ARE INOPERATIVE" troubleshooting procedure.
2	<ul style="list-style-type: none"> <li>Measure the voltage at the power window main switch (power window motor output terminal) while operating the passenger's side power window using the power window main switch.</li> <li>Is the voltage <b>B+</b>?</li> </ul> <p><b>Power retractable hardtop model:</b></p> <ul style="list-style-type: none"> <li>Open: terminal 1F/close: terminal 1D</li> </ul> <p><b>Soft-top model:</b></p> <ul style="list-style-type: none"> <li>Open: terminal D/close: terminal A</li> </ul>	Yes Go to the next step.
		No Replace the power window main switch.  (See <a href="#">POWER WINDOW MAIN SWITCH REMOVAL/INSTALLATION</a> .)

3	<ul style="list-style-type: none"> <li>Measure the voltage at the power window motor (battery power supply terminal) while operating the passenger's side power window using the power window main switch.</li> <li>Is the voltage <b>B+</b>? (Open: terminal A/close: terminal G)</li> </ul>	Yes	Go to the next step.
		No	<p>Inspect for an open or short circuit in the wiring harness between the power window main switch and the power window motor.</p> <p>Inspect the power window main switch and power window motor connector connections. (damage/pulled-out pins, corrosion)</p> <p>Repair or replace as necessary.</p>
4	<ul style="list-style-type: none"> <li>Operate the passenger's side power window using the power window main switch.</li> <li>Does the power window motor operate (rotate)?</li> </ul> <p><b>CAUTION:</b></p> <ul style="list-style-type: none"> <li>If the power window motor temperature is high, the motor may not rotate due to the motor internal bimetal function. Leave it untouched for about 3 min to cool it, then reinspect.</li> </ul>	Yes	Go to the next step.
		No	<p>Replace the power window motor.</p> <p>(See <b>POWER WINDOW REGULATOR REMOVAL/INSTALLATION.</b>)</p>
5	<ul style="list-style-type: none"> <li>Remove the door glass from carrier plate.</li> <li>Make sure that the door glass moves smoothly using your hand.</li> <li>Does the door glass move smoothly?</li> </ul>	Yes	<p>Replace the power window regulator.</p> <p>(See <b>POWER WINDOW REGULATOR REMOVAL/INSTALLATION.</b>)</p>
		No	<p>Inspect for a bent regulator guide or other possible malfunction.</p> <p>If normal, replace the door glass run-channel.</p>



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### No.4 ALL POWER WINDOWS ARE INOPERATIVE [POWER WINDOW SYSTEM]

4	All power windows are inoperative.
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>Power supply circuit or ground circuit malfunction <ul style="list-style-type: none"> <li>Burnt fuse (<b>B+</b>)</li> <li>Open or short circuit in wiring harness between ignition switch (<b>IG1</b>) and power window main switch</li> <li>Open or short circuit in wiring harness between power window main switch and power window motor</li> <li>Open or short circuit in wiring harness between power window main switch and ground</li> </ul> </li> <li>Power window main switch malfunction (switch malfunction)</li> <li>Power window motor malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>Operate the passenger's side power window using the power window main switch.</li> <li>Does any power window operate?</li> </ul>	Yes Go to step 5.
		No Go to the next step.
2	<ul style="list-style-type: none"> <li>Operate the driver's side power window using the power window main switch.</li> <li>Does the power window operate?</li> </ul>	Yes Go to the next step.
		No Inspect for an open circuit in the wiring harness between the power window main switch and the body ground.  Inspect the power window main switch connector connection. (damage/pulled-out pins, corrosion)  Repair or replace if necessary
3	<ul style="list-style-type: none"> <li>Is the P.WIND 20 A fuse normal?</li> </ul>	Yes Replace with the appropriate

			<p>standard fuse.</p> <p>If the fuse is melted, inspect the wiring harness for a short to ground. Repair or replace the wiring harness, then replace the fuse.</p>
		No	<p>Go to the next step. (power retractable hardtop model with exterior open function.)</p> <p>Replace the power window main switch.</p> <p>(See <b>POWER WINDOW MAIN SWITCH REMOVAL/INSTALLATION.</b>)</p> <p>(power retractable hardtop model without exterior open function/soft-top model.)</p>
4	<ul style="list-style-type: none"> <li>Measure the voltage at the power window main switch terminal 1A.</li> <li>Is the voltage <b>B+</b>?</li> </ul>	Yes	<p>Replace the power window main switch.</p> <p>(See <b>POWER WINDOW MAIN SWITCH REMOVAL/INSTALLATION.</b>)</p>
		No	<p>Inspect for an open or short circuit in the power window main switch wiring harness (battery power supply).</p> <p>Inspect the power window main switch connector connection. (damage/pulled-out pins, corrosion)</p> <p>Repair or replace if necessary.</p>
5	<ul style="list-style-type: none"> <li>Operate the power window using the power window main switch</li> <li>Does the power window motor operate (rotate)?</li> </ul> <p><b>CAUTION:</b></p> <ul style="list-style-type: none"> <li>If the power window motor temperature is high, the motor may not rotate due to the motor internal bimetal function. Leave it untouched for about 3 min to cool it down, then reinspect.</li> </ul>	Yes	<p>Go to the next step.</p>
		No	<p>Replace the power window motor.</p> <p>(See <b>POWER WINDOW REGULATOR REMOVAL/INSTALLATION.</b>)</p>
6	<ul style="list-style-type: none"> <li>Remove the door glass from the carrier plate.</li> <li>Make sure that the door glass moves</li> </ul>	Yes	<p>Replace the power window regulator guide.</p>
		No	<p>Inspect for a bent regulator guide or</p>

	<p>smoothly using your hand.</p> <ul style="list-style-type: none"> <li>Does the door glass move smoothly?</li> </ul>		<p>other possible malfunction. If normal, replace the glass run channel</p>
7	<p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>Do not operate the power window main switch during the following inspection.</li> <li>Inspect the continuity between power window main switch terminal (up-side 1I, 1D (power retractable hardtop model)/G, A (soft-top model) and ground.</li> <li>Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	<p>Replace the power window main switch.</p> <p>(See <b>POWER WINDOW MAIN SWITCH REMOVAL/INSTALLATION.</b>)</p>
8	<p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>Do not operate the power window main switch during the following inspection.</li> <li>Inspect the continuity between power window main switch terminal (down-side 1J, 1F (power retractable hardtop model)/B, D (soft-top model) and ground.</li> <li>Is there continuity?</li> </ul>	Yes	<p>Inspect the power window main switch connector connections. (damage/pulled-out pins, corrosion)</p> <p>Repair or replace if necessary.</p>
		No	<p>Replace the power window main switch.</p> <p>(See <b>POWER WINDOW MAIN SWITCH REMOVAL/INSTALLATION.</b>)</p>

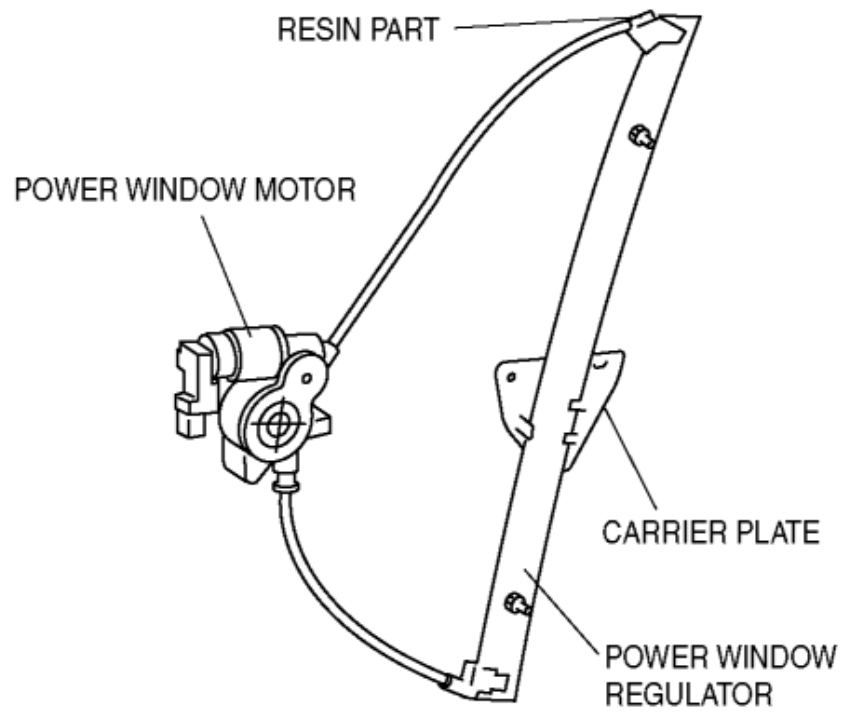
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No.5 ABNORMAL NOISE WHILE THE DOOR GLASS IS OPENIGN OR CLOSING [POWER WINDOW SYSTEM]

5	Abnormal noise while the door glass is opening or closing
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Installation screw is loose between the door glass and carrier plate.</li><li>• Deformity in the power window regulator plastic part due to use.<ul style="list-style-type: none"><li>▪ Scratching, wear marks to the power window regulator resin part due to twisting of the cable.</li><li>▪ Gear deformity in the power window motor.</li></ul></li></ul> <p>NOTE:</p> <ul style="list-style-type: none"><li>• Identify the location of the noise using a stethoscope or similar device.</li></ul>

Diagnostic procedure

Noise type	Time of occurrence	Possible cause	Location of noise	Action
Clanking noise	Door glass begins to move	Insufficiently tightened installation screw between the door glass and carrier plate.	Between door glass lower edge and carrier plate.	Securely tighten the installation screw.
Groaning noise (Sound increases due to use)	While door glass is operating	Vibration caused by wear on the resin part from cable twisting due to use of the power window regulator.  NOTE: <ul style="list-style-type: none"><li>• Noise does not occur if a roller is equipped to power window regulator resin part.</li></ul>	Power window regulator	Replace the power window regulator  (See <a href="#">POWER WINDOW REGULATOR REMOVAL/INSTALLATION.</a> )
Whining noise		Gear inside power window motor is deformed due to use.	Gear in power window motor	Replace the power window motor  (See <a href="#">POWER WINDOW REGULATOR REMOVAL/INSTALLATION.</a> )
Clicking noise (Periodic noise)				

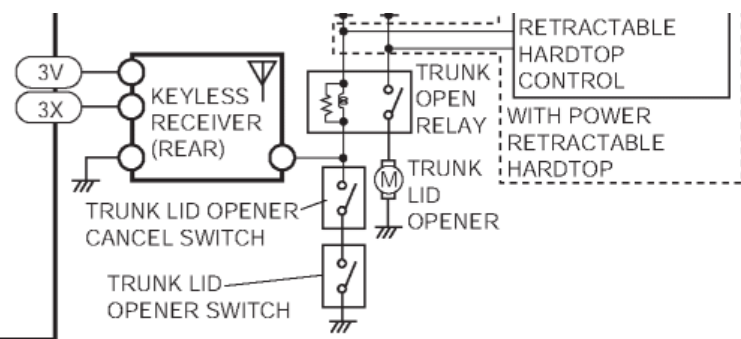
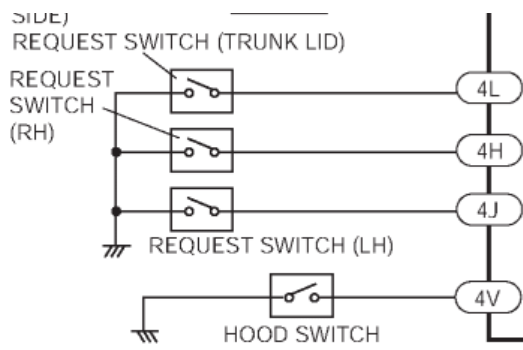


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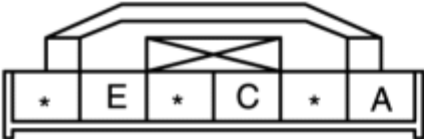
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NO.1 DOOR CANNOT BE LOCKED/UNLOCKED BY TRANSMITTER (CARD KEY) [ADVANCED KEYLESS SYSTEM]

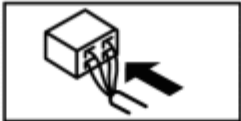
1	Door cannot be locked/unlocked by transmitter (card key)
POSSIBLE CAUSE	• Malfunction in transmitter (card key) battery or transmitter (card key)
	• Malfunction in keyless control module
	• Malfunction in keyless receiver
	• Wrong usage
	• The after-market electrical parts are interfering with the keyless entry system

KEYLESS RECEIVER  
WIRING HARNESS-SIDE CONNECTOR



KEYLESS CONTROL MODULE  
WIRING HARNESS-SIDE CONNECTOR

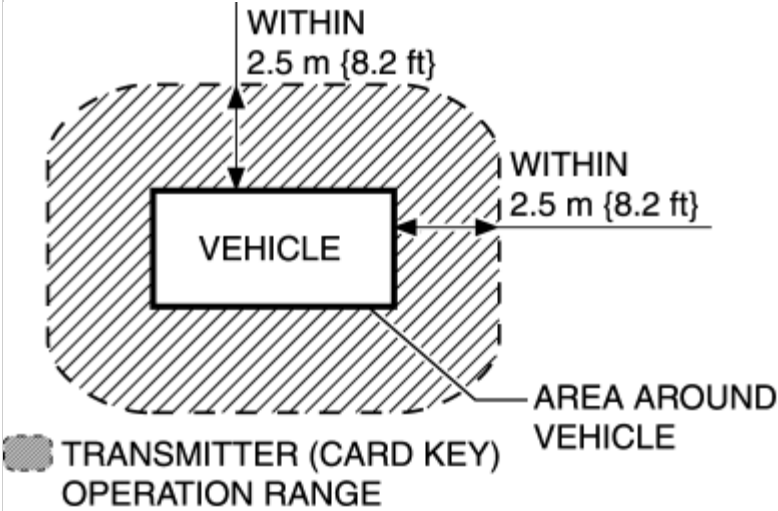
*	3Y	3V	3S	3P	*	*	3G	*	*
*	3Z	*	*	*	3N	3K	3H	*	3B
*	3AA	3X	3U	3R	3O	*	3I	3F	3C



Diagnostic procedure

STEP	INSPECTION	ACTION
1	<div><div>• Attempt to lock/unlock the door with the transmitter (card key).</div><div>• Does the operation indicator light (LED) illuminate?</div></div>	YesGo to the next step.
		NoGo to step 7.
2	<div>• Did the customer activate the transmitter (card key) within</div>	YesGo to the next step.



	operative area (Within <b>2.5 m {8.2 ft}</b> from area around vehicle)?		
		No The system is normal.  Explain to the customer that the system does not work without the system operative area.	
3	<ul style="list-style-type: none"> <li>Did the customer use the keyless entry system in particular area, such as being near TV towers, power plants, power lines, or factories?</li> </ul>	Yes The system is normal.  Area of operation is subject.  Explain effect of outside interference on the transmitter (card key) to the customer.	
		No Go to the next step.	
4	<ul style="list-style-type: none"> <li>Did the customer activate the keyless entry system with all following conditions satisfied?             <ul style="list-style-type: none"> <li>All doors closed</li> <li>Mechanical key is not in steering lock unit.</li> <li>Start knob is at LOCK position.</li> <li>Start knob is not pressed.</li> </ul> </li> </ul>	Yes Go to the next step.	
		No The system is normal.  Explain to the customer that the system does not work without these conditions satisfied.	
5	<ul style="list-style-type: none"> <li>Are any of the following after-market electrical parts on the vehicle?             <ul style="list-style-type: none"> <li>Cellular phone</li> <li>Radio-wave equipment</li> <li>Remote engine starter</li> <li>TV</li> </ul> </li> </ul>	Yes Go to the next step.	
		No Go to step 7.	

	Other		
6	<ul style="list-style-type: none"> <li>Disconnect the after-market electrical parts connectors and attempt to lock/unlock the doors with the transmitter (card key).</li> <li>Does the keyless entry system work?</li> </ul>	Yes	The system is normal. The after-market electrical parts are interfering with the keyless entry system.
		No	Go to the next step.
7	<ul style="list-style-type: none"> <li>Is there repair record of the customer's keyless entry system?</li> </ul>	Yes	Go to the next step.
		No	Go to Step 10.
8	<ul style="list-style-type: none"> <li>Does the malfunction occur after the repair?</li> </ul>	Yes	Go to the next step.
		No	Go to Step 10.
9	<ul style="list-style-type: none"> <li>Is the malfunction corrected when the ID numbers for all the customer's transmitters (card key) are updated?</li> </ul> <p>(See <b>CARD KEY ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</b>.)</p>	Yes	System is normal. (Explain to the customer that the malfunction occurred because all the transmitter (card key) ID numbers were not updated even though the body control module or a transmitter (card key) was replaced in the previous servicing.)
		No	Go to the next step.
10	<ul style="list-style-type: none"> <li>Visually inspect the transmitter (card key) battery for the following:</li> </ul> <p>(See <b>CARD KEY BATTERY REPLACEMENT [ADVANCED KEYLESS SYSTEM]</b>.)</p> <ul style="list-style-type: none"> <li>Battery insertion direction (correct polarity)</li> <li>Battery type (<b>CR2025</b>)</li> <li>Corrosion, soiling, deformation of battery terminals (plus/minus terminals)</li> <li>Contact malfunction between the battery terminal and battery when battery is inserted</li> </ul> <ul style="list-style-type: none"> <li>Is there any malfunction?</li> </ul>	Yes	<p><b>Battery insertion direction, battery type problem:</b></p> <ul style="list-style-type: none"> <li>Properly install the battery or replace the battery with a specified one (<b>CR2025</b>), then go to the next step.</li> </ul> <p><b>Malfunction with the battery terminals:</b></p> <ul style="list-style-type: none"> <li>Clean corrosion and soiling or repair the terminal, then go to the next step.</li> </ul>
		No	Go to the next step.

11	<p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• Use a new monitor battery (normal battery) or one from another vehicle which operates normally.</li> <li>• Replace the battery in all the transmitters (card key) with a monitor-use battery (normal battery).</li> </ul> <p>(See <b>CARD KEY BATTERY REPLACEMENT [ADVANCED KEYLESS SYSTEM]</b>.)</p> <ul style="list-style-type: none"> <li>• For each transmitter (card key), verify that the transmitter operation indicator light (LED) illuminates when a button is operated.</li> <li>• Does operation indicator light (LED) for each transmitter (card key) operate?</li> </ul>	Yes	Go to the next step.
12	<p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• Inspect for all transmitters (card key).</li> <li>• Inspect while the batteries for all of the transmitters (card key) are replaced with monitor-use batteries (normal battery).</li> <li>• Verify the operation of keyless entry system using all of the transmitters (card key).</li> <li>• Does the keyless entry system operate properly?</li> </ul>	Yes	<p>Replace the transmitter (card key) battery, and then go to Step 24.</p> <p>(See <b>CARD KEY BATTERY REPLACEMENT [ADVANCED KEYLESS SYSTEM]</b>.)</p>
13	<ul style="list-style-type: none"> <li>• Replace with a transmitter (card key) battery known to be good.</li> <li>• Does the keyless entry system operate properly?</li> </ul>	Yes	Replace the transmitter (card key) battery, and then go to step 24.
14	<ul style="list-style-type: none"> <li>• Inspect for the keyless receiver installation.</li> <li>• Is the bracket securely installed on the keyless receiver?</li> </ul>	Yes	Go to the next step.
15	<ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Measure the voltage at keyless</li> </ul>	Yes	Go to the next step.
		No	<ul style="list-style-type: none"> <li>• Inspect ROOM 15 A fuse.</li> </ul>

	<p>receiver terminal A?</p> <ul style="list-style-type: none"><li>• Is the voltage <b>B+</b>?</li></ul>		<ul style="list-style-type: none"><li>• Inspect and repair the wiring harness between the fuse block and the keyless receiver as necessary.</li></ul>
16	<ul style="list-style-type: none"><li>• Measure the voltage at keyless receiver terminal E?</li><li>• Is the voltage <b>0 V</b>?</li></ul>	Yes	Go to the next step.
		No	<ul style="list-style-type: none"><li>• Inspect and repair the wiring harness between the ground wire and the keyless receiver as necessary.</li><li>• Re-tighten the ground wire as necessary.</li></ul>
17	<ul style="list-style-type: none"><li>• Disconnect the keyless receiver connector (6-pin) and keyless control module connector (75-pin).</li><li>• Is there continuity between the following terminals?<ul style="list-style-type: none"><li>▪ Keyless receiver connector terminal A —keyless control module connector terminal 3S</li><li>▪ Keyless receiver connector terminal C —keyless control module connector terminal 3U</li></ul></li></ul>	Yes	Go to the next step.
		No	<ul style="list-style-type: none"><li>• Inspect and repair the wiring harness between the keyless control module and the keyless receiver, then go to the next step.</li></ul>
18	<ul style="list-style-type: none"><li>• Remove the key from steering lock.</li><li>• Measure the pulse profile using an oscilloscope at the keyless control module terminal 3U while operating the transmitter (card key).</li><li>• Is the pulse profile become long at moment of transmitter operation?</li></ul>	Yes	Go to the next step.
		No	Replace the keyless receiver, and then go to the next step.
19	<ul style="list-style-type: none"><li>• Measure the signal wave pattern of keyless control module terminal 3U using an oscilloscope while the transmitter (card key) is operated with the auxiliary key removed from the ignition key cylinder.</li><li>• Does the wave pattern change when the transmitter (card key) is</li></ul>	Yes	Go to the next step.
		No	Replace the keyless receiver, and then go to Step 24.

	<p>operated?</p> <p><b>NOTE:</b></p> <ul style="list-style-type: none"><li>Perform the oscilloscope setting using 0.5 V/DIV (Y), 100 ms/DIV (X), DC range.</li></ul>		
20	<ul style="list-style-type: none"><li>Measure the voltage at the keyless control module terminals 3B, 3I, 1E and 1F.<ul style="list-style-type: none"><li>Terminal 3B: <b>IG1 voltage</b></li><li>Terminal 1E, 1F: <b>B+</b></li><li>Terminal 3I: <b>ACC voltage</b></li></ul></li><li>Is the voltage as above?</li></ul>	Yes	Go to the next step.
		No	<ul style="list-style-type: none"><li>Inspect for fuse.</li><li>Inspect and repair the wiring harness between the keyless control module and the fuse block as necessary.</li><li>Then go to the next step.</li></ul>
21	<ul style="list-style-type: none"><li>Measure the voltage at keyless control module terminal 3C?</li><li>Is the voltage <b>0 V</b>?</li></ul>	Yes	Go to the next step.
		No	<ul style="list-style-type: none"><li>Inspect and repair the wiring harness between the ground wire and the keyless control module as necessary.</li><li>Re-tighten the ground wire as necessary.</li><li>Then go to the next step.</li></ul>
22	<ul style="list-style-type: none"><li>Turn the start knob to LOCK position with mechanical key is not in ignition switch, and the start knob is not pushed.</li><li>Measure the voltage following keyless control module connector.<ul style="list-style-type: none"><li>Terminal 3O (keyless switch): <b>below 1.0 V</b></li><li>Terminal 3N (start knob (push switch)) : <b>below 1.0 V</b></li><li>Terminal 3I (ACC voltage): <b>below 1.0 V</b></li><li>Terminal 3B (IG1 voltage): <b>below 1.0</b></li></ul></li></ul>	Yes	Go to the next step.
		No	<ul style="list-style-type: none"><li>Inspect for key reminder switch.</li><li>Inspect and repair the wiring harness between the steering lock unit (key reminder switch) and the keyless control module.</li><li>Then go to the next step.</li></ul>

	<p><b>V</b></p> <ul style="list-style-type: none"> <li>Is the signal voltage normal?</li> </ul>		
23	<ul style="list-style-type: none"> <li>Measure voltage at the keyless control module terminal 4Q. <ul style="list-style-type: none"> <li>All doors closed: <b>B+</b></li> <li>Any door opened: <b>below 1.0 V</b></li> </ul> </li> <li>Is the voltage normal?</li> </ul>	Yes	Go to the next step.
		No	Inspect the door switch.  If normal, inspect for open or short at the door switch related harness.
24	<ul style="list-style-type: none"> <li>Measure the voltage at the keyless control module terminals 1C and 1A while operating the transmitter. <ul style="list-style-type: none"> <li>All doors locked: <b>1.0 V or less→B+→1.0 V or less</b> (terminal 1C)</li> <li>Any door unlocked: <b>1.0 V or less→B+→1.0 V or less</b> (terminal 1A)</li> </ul> </li> <li>Is the voltage as above?</li> </ul>	Yes	Replace the keyless control module.
		No	Inspect and repair the wiring harness between the keyless control module and door lock actuator.  If the wiring harness is normal, inspect the door lock actuator.
25	<ul style="list-style-type: none"> <li>Does the keyless entry system operate properly?</li> </ul>	Yes	Troubleshooting completed. Explain repairs to the customers
		No	Re-inspect the malfunction symptoms, then repeat from step 1 if malfunction recurs.

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### NO.2 BLINK KEYLESS INDICATOR LIGHT [ADVANCED KEYLESS SYSTEM]

2	Blink keyless indicator light
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Low transmitter (card key) battery voltage.</li></ul>

#### Diagnostic procedure

STEP	ACTION
1	<ul style="list-style-type: none"><li>• Replace wit new transmitter (card key) battery.</li></ul>

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NO.3 ADVANCED KEYLESS ENTRY FUNCTION INOPERATIVE [ADVANCED KEYLESS SYSTEM]

3	<b>Advanced keyless entry function inoperative</b>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"><li>• Malfunction in the transmitter (card key).</li><li>• Malfunction in the keyless control module.</li><li>• Malfunction in the keyless receiver.</li><li>• Malfunction in the keyless antenna.</li><li>• Wrong usage.</li></ul>

KEYLESS CONTROL MODULE WIRING HARNESS SIDE CONNECTOR

The diagram illustrates the wiring harness side connector for the Keyless Control Module. It consists of four main connector blocks. The first block (leftmost) has pins 4Y, 4Z, 4AA, 4J, 4Q, 4N, 4K, 4H, 4E, 4B, 4L, 4I, 4C. The second block has pins 3Y, 3Z, 3AA, 3V, 3X, 3S, 3U, 3P, 3R, 3O, 3N, 3K, 3H, 3I, 3F, 3C. The third block has pins 2K, 2L, 2J, 2I, 2H, 2G, 2F, 2E, 2D, 2C, 2B, 2A. The fourth block (rightmost) has pins 1E, 1F, 1C, 1D, 1A, 1B. A small inset diagram shows a connector with a red arrow pointing to it.

Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"><li>• Retrieve the advanced keyless system DTC using the M-MDS.</li><li>• Are there DTC displayed?</li></ul>	YesPerform the applicable DTC diagnostic procedures.
		NoGo to the next step.
2	<ul style="list-style-type: none"><li>• Did the customer attempt to operate each front doors and trunk rid using the request switch?</li></ul>	YesGo to the next step.
		NoInspect the advanced keyless system operations using the request switch. If the advanced keyless system is inoperative, then go to the next step.
3	<ul style="list-style-type: none"><li>• Prepare the followings:<ul style="list-style-type: none"><li>▪ Make sure that there is no transmitter (card key) inside the passenger compartment.</li><li>▪ Close all doors including trunk rid.</li><li>▪ Remove the key from the steering lock.</li><li>▪ Make sure that start knob is to the LOCK position. (Do not Press the knob)</li><li>▪ Make sure that the transmitter (card key) is within the advanced keyless</li></ul></li></ul>	YesThe system is normal. Explain the advanced keyless system operation.
		NoGo to the next step.



	<p>system operative area (<b>within 80 cm {2.6 ft}</b> from front door)</p> <ul style="list-style-type: none"> <li>Does the advanced keyless system operate properly?</li> </ul>		
4	<ul style="list-style-type: none"> <li>Replace with a transmitter (card key) battery known to be good.</li> <li>Operate the transmitter (card key).</li> <li>Does the keyless entry system operate properly?</li> </ul>	Yes	Replace the transmitter (card key). Then go to the next step.
		No	Go to the next step.
5	<ul style="list-style-type: none"> <li>Measure the voltage at the keyless control module terminals 4H, 4J and 4L while operating the request switch. <ul style="list-style-type: none"> <li>Operate driver's side front door request switch (4J): <b>5.0 V→1.0 V or less</b></li> <li>Operate passenger's side front door request switch (4H): <b>5.0 V→1.0 V or less</b></li> <li>Operate trunk lid request switch (4L): <b>5.0 V→1.0 V or less</b></li> </ul> </li> <li>Is the voltage as above?</li> </ul>	Yes	Go to the next step.
		No	Inspect and repair the applicable wiring harness as necessary, then go to the next step.
6	<ul style="list-style-type: none"> <li>Turn the start knob to LOCK position with mechanical key is not in ignition switch, and the start knob is not pushed.</li> <li>Measure the voltage following keyless control module connector. <ul style="list-style-type: none"> <li>Terminal 3O (keyless switch): <b>below 1.0 V</b></li> <li>Terminal 3N (start knob (push switch)): <b>below 1.0 V</b></li> <li>Terminal 3I (ACC voltage): <b>below 1.0 V</b></li> <li>Terminal 3B (IG1 voltage): <b>below 1.0 V</b></li> </ul> </li> <li>Is the signal voltage normal?</li> </ul>	Yes	Go to the next step.
		No	Inspect and repair for open or short circuit in wiring between the suspect switch and keyless control module, then go to the next step.
7	<ul style="list-style-type: none"> <li>Simulate the following keyless antenna using the M-MDS: <ul style="list-style-type: none"> <li>ANT_RF# (exterior, RF keyless antenna: terminals 2A and 2B)</li> <li>ANT_LF# (exterior, LF keyless antenna: terminals 2C and 2D)</li> <li>ANT_BK# (exterior, rear keyless antenna: terminals 2E and 2F)</li> <li>ANT_INN1# (interior, trunk keyless antenna: terminals 2G and 2H)</li> <li>ANT_INN2# (interior, rear keyless antenna: terminals 2I and 2J)</li> <li>ANT_INN3# (interior, middle keyless antenna: terminals 2K and 2L)</li> <li>ANT_INN4# (interior, front keyless antenna: terminals 3G and 3H)</li> </ul> </li> <li>Does each antenna operate properly (ON/OFF)?</li> </ul>	Yes	Go to the next step.
		No	<ul style="list-style-type: none"> <li>Inspect for open or short circuit between suspect keyless antenna and keyless control module. <ul style="list-style-type: none"> <li>If the wiring harness normal, replace suspect keyless antenna, then go to the next step.</li> <li>If the wiring harness is not normal, repair or replace for open or short circuit, then go to the next step.</li> </ul> </li> </ul>

8	<ul style="list-style-type: none"> <li>• Measure the pulse profile using an oscilloscope at the keyless control module terminal 3U while operating the transmitter (card key).</li> <li>• Is the pulse profile become long at moment of transmitter operation?</li> </ul>	Yes	Go to the next step.
		No	<ul style="list-style-type: none"> <li>• Inspect the wiring harness between the keyless receiver and the keyless control module. <ul style="list-style-type: none"> <li>▪ If the harness is normal, replace the keyless receiver.</li> <li>▪ If the harness is malfunctioning, repair the wiring harness.</li> </ul> </li> <li>• Go to the next step.</li> </ul>
9	<ul style="list-style-type: none"> <li>• Measure the voltage at the keyless control module terminal 1A while operating the request switch. <ul style="list-style-type: none"> <li>▪ Unlock: <b>1.0 V or less</b>→<b>B+</b>→<b>1.0 V or less</b></li> </ul> </li> <li>• Is the voltage as above?</li> </ul>	Yes	Inspect the keyless control module and replace as necessary.
		No	<p>Inspect and repair the wiring harness between keyless control module and door lock actuator.</p> <p>If the wiring harness is normal, inspect the door lock actuator.</p>
10	<ul style="list-style-type: none"> <li>• Does the keyless entry system operate properly?</li> </ul>	Yes	Troubleshooting completed. Explain repairs to the customers
		No	Re-inspect the malfunction symptoms, then repeat form Step 1 if malfunction recurs.

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NO.4 ADVANCED KEYLESS START FUNCTION INOPERATIVE [ADVANCED KEYLESS SYSTEM]

4	<b>Advanced keyless start function inoperative</b>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"><li>• Malfunction in the transmitter (card key).</li><li>• Malfunction in the keyless control module.</li><li>• Malfunction in the keyless receiver.</li><li>• Malfunction in the keyless antenna.</li><li>• Malfunction in the PCM.</li></ul>

KEYLESS CONTROL MODULE WIRING HARNESS SIDE CONNECTOR

4Y \* \* \* \* 4J 4G \* 4A  
4Z \* 4T 4Q 4N 4K 4H 4E 4B  
4AA \* \* \* \* 4L 4I \* 4C

\* 3Y 3V 3S 3P \* \* 3G \* \*  
\* 3Z \* \* \* 3N 3K 3H \* 3B  
\* 3AA 3X 3U 3R 3O \* 3I 3F 3C

2K 2I 2G 2E 2C 2A  
2L 2J 2H 2F 2D 2B

1E 1C 1A  
1F 1D 1B

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<ul style="list-style-type: none"><li>• Retrieve the advanced keyless system DTC using the M-MDS.</li><li>• Are there DTC displayed?</li></ul>	Yes	Perform the applicable DTC diagnostic procedures.
		No	Go to the next step.
2	<ul style="list-style-type: none"><li>• Attempt to start the engine using the key.</li><li>• Does engine start?</li></ul>	Yes	Go to the next step.
		No	Go to symptom troubleshooting flow No.3 in 01-03 section.
3	<ul style="list-style-type: none"><li>• Does the keyless indicator light (green) turn ON when pressing the start knob?</li></ul>	Yes	Go to step 11.
		No	<p><b>If the keyless indicator light (green) does not illuminate:</b></p> <ul style="list-style-type: none"><li>• Go to the next step.</li></ul> <p><b>If the keyless warning light (red) is flashing:</b></p> <ul style="list-style-type: none"><li>• Go to Step 6.</li></ul> <p><b>If the keyless warning light (red) illuminates:</b></p> <ul style="list-style-type: none"><li>• Go to Step 9.</li></ul>
4	<ul style="list-style-type: none"><li>• Bring the transmitter (card key) inside the</li></ul>	Yes	Go to the next step.

	<p>passenger compartment.</p> <ul style="list-style-type: none"> <li>• Measure the voltage at the keyless control module terminal 3N (push switch) while pushing the start knob.</li> <li>• Is the voltage <b>B+</b>?</li> </ul>	No	<ul style="list-style-type: none"> <li>• Inspect the wiring harness between the steering lock unit and keyless control. <ul style="list-style-type: none"> <li>▪ If the harness is normal, replace the steering lock unit.</li> <li>▪ If the harness is malfunctioning, repair the wiring harness.</li> </ul> </li> <li>• Go to the next step.</li> </ul>
5	<ul style="list-style-type: none"> <li>• Replace with a transmitter (card key) battery known to be good.</li> <li>• Bring the transmitter (card key) inside the passenger compartment.</li> <li>• Does the keyless entry system operate properly?</li> </ul>	Yes	Replace the transmitter (card key). Then go to the next step.
		No	Go to the next step.
6	<ul style="list-style-type: none"> <li>• Simulate the following keyless antenna using the M-MDS: . <ul style="list-style-type: none"> <li>▪ ANT_RF# (exterior, RF keyless antenna: terminals 2A and 2B)</li> <li>▪ ANT_LF# (exterior, LF keyless antenna: terminals 2C and 2D)</li> <li>▪ ANT_BK# (exterior, rear keyless antenna: terminals 2E and 2F)</li> <li>▪ ANT_INN1# (interior, trunk keyless antenna: terminals 2G and 2H)</li> <li>▪ ANT_INN2# (interior, rear keyless antenna: terminals 2I and 2J)</li> <li>▪ ANT_INN3# (interior, middle keyless antenna: terminals 2K and 2L)</li> <li>▪ ANT_INN4# (interior, front keyless antenna: terminals 3G and 3H)</li> </ul> </li> <li>• Does each antenna operate properly (ON/OFF)?</li> </ul>	Yes	Go to the next step.
		No	<ul style="list-style-type: none"> <li>• Inspect for open or short circuit between suspect keyless antenna and keyless control module. <ul style="list-style-type: none"> <li>▪ If the wiring harness normal, replace suspect keyless antenna, then go to the next step.</li> <li>▪ If the wiring harness is not normal, repair or replace for open or short circuit, then go to the next step.</li> </ul> </li> </ul>
7	<ul style="list-style-type: none"> <li>• Measure the pulse profile using an oscilloscope at the keyless control module terminal 3U while operating the transmitter (card key).</li> <li>• Is the pulse profile become long at moment of transmitter operation?</li> </ul>	Yes	Go to the next step.
		No	<ul style="list-style-type: none"> <li>• Inspect the wiring harness between the keyless receiver and the keyless control module. <ul style="list-style-type: none"> <li>▪ If the harness is normal, replace the keyless receiver.</li> <li>▪ If the harness is malfunctioning, repair the wiring harness.</li> </ul> </li> <li>• Go to the next step.</li> </ul>
8	<ul style="list-style-type: none"> <li>• Inspect the keyless receiver.</li> <li>(See <b>KEYLESS RECEIVER INSPECTION [ADVANCED KEYLESS SYSTEM]</b>.)</li> <li>• Is the keyless receiver normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace malfunctioning part according to inspection result.
9	<ul style="list-style-type: none"> <li>• Measure the keyless control module terminal 3P</li> </ul>	Yes	Go to the next step.

	<p>voltage.</p> <ul style="list-style-type: none"> <li>Is the voltage <b>approx. 5.0 V</b>?</li> </ul>	<p>No Inspect for open or short circuit between keyless control module terminal 3P (75-pin) and keyless receiver unit terminal C (6-pin).</p> <p>Is the wiring harness is not normal, repair or replace for open or short circuit, then go to the next step.</p> <p>If the wiring harness is normal, go to the next step.</p>
10	<ul style="list-style-type: none"> <li>Replace steering lock unit.</li> <li>Turn the start knob to START position.</li> <li>Does the advanced keyless start operate properly?</li> </ul>	<p>Yes Troubleshooting completed.</p> <p>Explain repairs to the customers.</p>
		<p>No Replace the keyless control module.</p> <p>(See <b>KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</b>.)</p> <p>Then go to the next step.</p>
11	<ul style="list-style-type: none"> <li>Does the keyless entry system operate properly?</li> </ul>	<p>Yes Troubleshooting completed. Explain repairs to the customers.</p>
		<p>No Re-inspect the malfunction symptoms, then repeat form step 1 if malfunction recurs.</p>

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### SYMPTOM TROUBLESHOOTING CHART [ADVANCED KEYLESS SYSTEM]

#### NOTE:

- The KEY indicator light (green) flashes for approximately **30 s** to indicate that the remaining battery power of the transmitter is low. Replace with a new battery before the transmitter becomes unusable.
- In the following cases, the KEY warning light (red) illuminates and the engine will not start.
  - The transmitter battery is dead.
  - The transmitter not within operational range.
  - The transmitter is placed in areas where it is difficult for the system to detect the signal.
  - A key from another manufacturer similar to the transmitter is in the operational range.

No.	Troubleshooting item	Page
1	Door cannot be locked/unlocked by transmitter (card key)	See <b>NO.1 DOOR CANNOT BE LOCKED/UNLOCKED BY TRANSMITTER (CARD KEY) [ADVANCED KEYLESS SYSTEM]</b>
2	Blink keyless indicator light	See <b>NO.2 BLINK KEYLESS INDICATOR LIGHT [ADVANCED KEYLESS SYSTEM]</b>
3	Advanced keyless entry function inoperative	See <b>NO.3 ADVANCED KEYLESS ENTRY FUNCTION INOPERATIVE [ADVANCED KEYLESS SYSTEM]</b>
4	Advanced keyless start function inoperative	See <b>NO.4 ADVANCED KEYLESS START FUNCTION INOPERATIVE [ADVANCED KEYLESS SYSTEM]</b>

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### FOREWORD [ADVANCED KEYLESS SYSTEM]

- The advanced keyless system is controlled by the keyless control module.
- “All locks” includes the trunk lid.

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## 2008 - MX-5 - Body and Accessories

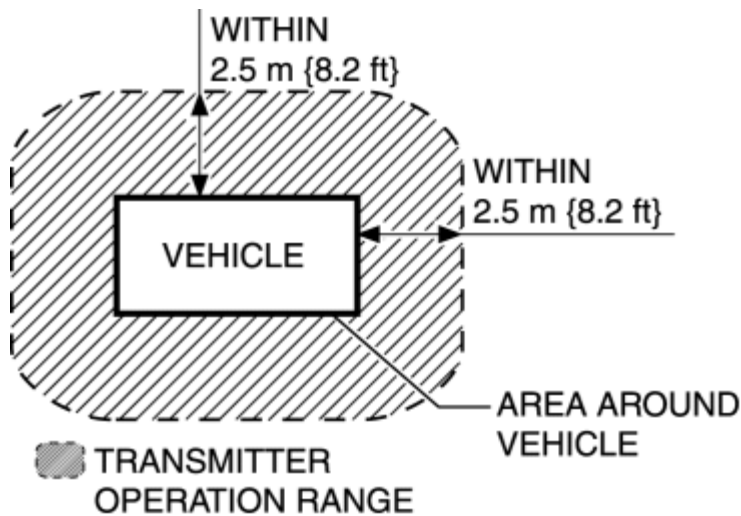
### KEYLESS ENTRY SYSTEM PRELIMINARY INSPECTION [KEYLESS ENTRY SYSTEM]

- Perform the following preliminary inspection before troubleshooting.

STEP	INSPECTION	ACTION	
1	<ul style="list-style-type: none"> <li>• Is an after-market system installed?</li> </ul>	Yes	Perform troubleshooting according to the after-market keyless entry system manual.
		No	Go to the next step.
2	<ul style="list-style-type: none"> <li>• Did the customer activate the keyless entry system with the key inserted into the steering lock?</li> </ul>	Yes	<ul style="list-style-type: none"> <li>• Explain to the customer that the system does not work with the key inserted into the steering lock.</li> <li>• Go to the next step.</li> </ul>
		No	Go to the next step.
3	<ul style="list-style-type: none"> <li>• The transmitter operation indicator light (LED) illuminates when any operation using the transmitter is performed.</li> </ul>	Yes	Go to Step 8.
		No	Go to the next step.
4	<ul style="list-style-type: none"> <li>• Visually inspect the transmitter battery for the following: (See <b>TRANSMITTER BATTERY REPLACEMENT [KEYLESS ENTRY SYSTEM]</b>.) <ul style="list-style-type: none"> <li>▪ Battery direction (polarity)</li> <li>▪ Battery type (CR1620)</li> <li>▪ Corrosion, soiling, deformation of battery terminals (plus/minus terminals)</li> </ul> </li> </ul>	Yes	<p><b>Battery insertion direction, battery type problem:</b></p> <ul style="list-style-type: none"> <li>• Properly install the battery or replace the battery with a specified one (CR1620), then go to the next step.</li> </ul> <p><b>Battery terminal malfunction:</b></p> <ul style="list-style-type: none"> <li>• Clean corrosion and soiling or repair the terminal, then go to the next step.</li> </ul>



	<ul style="list-style-type: none"> <li>▪ Contact malfunction between the battery terminal and battery when battery is inserted</li> </ul>		
	<ul style="list-style-type: none"> <li>• Is there any malfunction?</li> </ul>	No	Go to Step 6.
5	<ul style="list-style-type: none"> <li>• Does the keyless entry system operate properly?</li> </ul>	Yes	Go to Step 8.
		No	Go to the next step.
6	<p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• Use a new monitor battery (normal battery) or one from another vehicle which operates normally.</li> <li>• Replace the battery in all the transmitters with a monitor-use battery (normal battery).</li> </ul> <p>(See <b>TRANSMITTER BATTERY REPLACEMENT [KEYLESS ENTRY SYSTEM]</b>.)</p> <ul style="list-style-type: none"> <li>• For each transmitter, verify that the transmitter operation indicator light (LED) illuminates when a button is operated.</li> <li>• Does operation indicator light (LED) for each transmitter operate?</li> </ul>	Yes	Go to the next step.
		No	If the operation indicator light (LED) does not illuminate, replace the transmitter, then go to Step 11.
7	<p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• Inspect for all transmitters.</li> <li>• Inspect while the batteries for all of the transmitters are replaced with monitor-use batteries (normal battery).</li> <li>• Verify the operation of keyless entry system using all of the transmitters.</li> <li>• Does the keyless entry system operate normally?</li> </ul>	Yes	Replace the battery, then go to Step 11.  (See <b>TRANSMITTER BATTERY REPLACEMENT [KEYLESS ENTRY SYSTEM]</b> .)
		No	Go to the next step.
8	<ul style="list-style-type: none"> <li>• Did the customer activate the transmitter within operative area (Within 2.5 m {8.2 ft} from area around vehicle)?</li> </ul>	Yes	Go to the next step.
		No	The system is normal.



Explain to the customer that the system does not work without the system operative area.

- 9
- Did the customer use the keyless entry system in particular area, such as being near TV towers, power plants, power lines, or factories?

Yes Attempt to lock/unlock the doors with the transmitter in a non-interference area.

**If system operates:**

- Area of operation is suspect. Explain effect of outside interference on the transmitter to the customer.

**If system does not operate:**

- Go to the next step.

No Go to the next step.

- 10
- Are any of the following after-market electrical parts on the vehicle?
    - Cellular phone
    - Radio-wave equipment
    - Remote engine starter
    - TV

Yes Disconnect the after-market electrical part connectors and attempt to lock/unlock the doors with the transmitter.

**If system operates:**

- The after-market electrical parts are interfering with the keyless entry system.

**If system does not operate:**

- Go to the next step.

No Go to the next step.

- 11
- Perform the on-board diagnostic function.
- (See **KEYLESS ENTRY SYSTEM ON-**

Yes Go to the next step.

No • Go to step 1 of

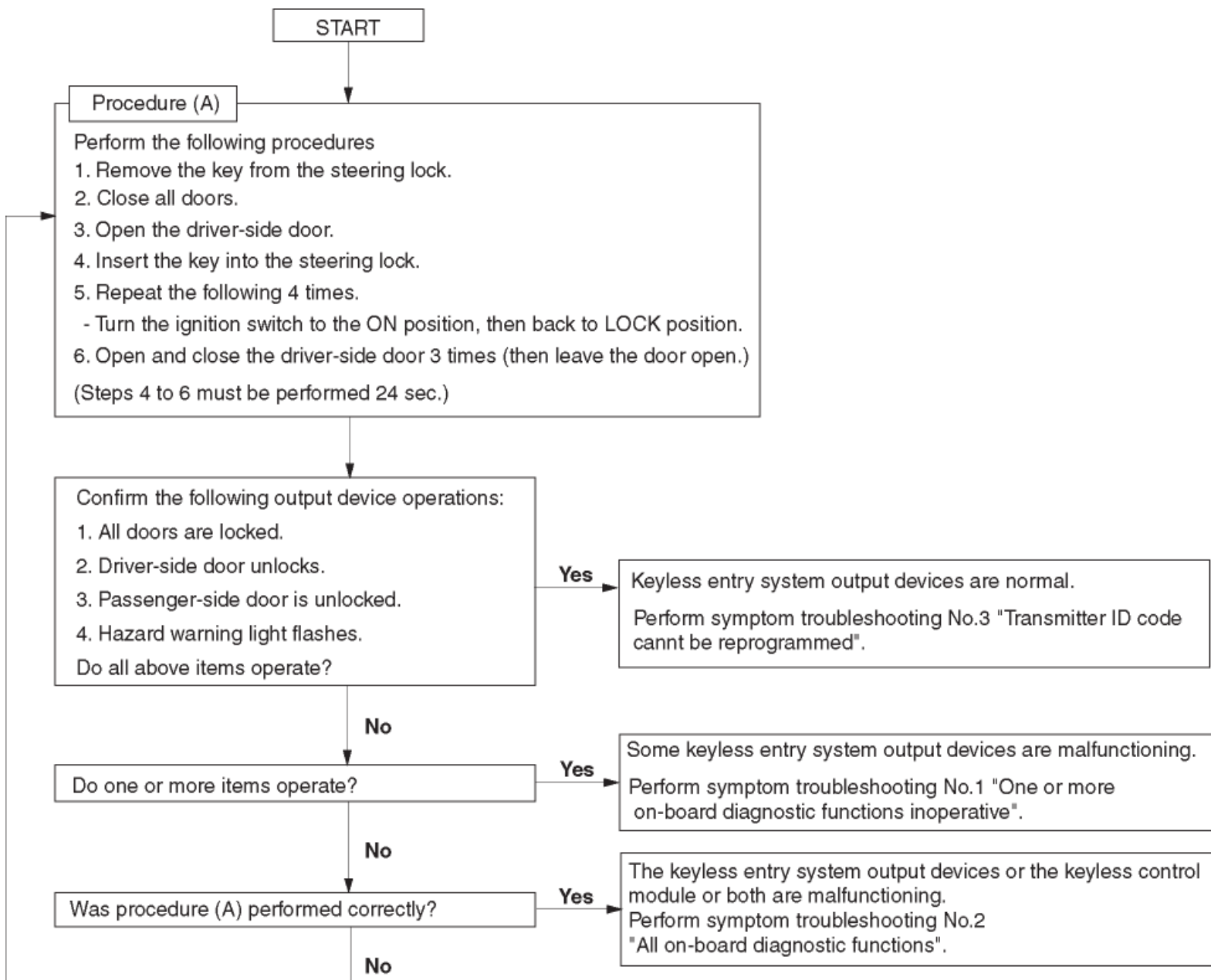
	<p><b>BOARD DIAGNOSIS [KEYLESS ENTRY SYSTEM].)</b></p> <ul style="list-style-type: none"> <li>Does the on-board diagnostic function work?</li> </ul>		<p>troubleshooting NO. 1.</p> <p>(See <b>NO.1 ONE OR MORE ON-BOARD DIAGNOSTIC FUNCTIONS INOPERATIVE [KEYLESS ENTRY SYSTEM].)</b></p> <ul style="list-style-type: none"> <li>Go to step 1 of troubleshooting NO. 2.</li> </ul> <p>(See <b>NO.2 ALL ON-BOARD DIAGNOSTIC FUNCTIONS INOPERATIVE [KEYLESS ENTRY SYSTEM].)</b></p>
12	<ul style="list-style-type: none"> <li>Attempt to reprogram the transmitter ID code.</li> <li>Can the transmitter ID code be reprogrammed?</li> </ul>	Yes	The system is normal.
		No	<p>Go to step 1 of troubleshooting NO. 3.</p> <p>(See <b>NO.3 TRANSMITTER ID CODE CANNOT BE REPROGRAMMED [KEYLESS ENTRY SYSTEM].)</b></p>

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### KEYLESS ENTRY SYSTEM ON-BOARD DIAGNOSIS [KEYLESS ENTRY SYSTEM]

#### NOTE:

- When the trunk lid opener cancel switch is at the ON position, the trunk lid does not unlock even when the trunk lid button is pressed. Verify that the trunk lid cancel switch is at the OFF position when performing the on-board diagnostic test.
- The trunk lid opener cancel switch is located in the trunk compartment.
- "All doors" includes the trunk lid.



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### NO.1 ONE OR MORE ON-BOARD DIAGNOSTIC FUNCTIONS INOPERATIVE [KEYLESS ENTRY SYSTEM]

- When performing an asterisked (\*) troubleshooting inspection, slightly shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, verify that the connectors, terminals and wiring harnesses are connected correctly and undamaged.

<b>1</b>	<b>One or more on-board diagnostic functions inoperative</b>
<b>DESCRIPTION</b>	<ul style="list-style-type: none"> <li>• Malfunction in trunk lid opener system, horn system, hazard warning light system, or door lock linkage system</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Malfunction in trunk lid opener system <ul style="list-style-type: none"> <li>▪ Trunk lid opener relay circuit malfunction</li> <li>▪ Keyless control module malfunction</li> </ul> </li> <li>• Malfunction in horn system <ul style="list-style-type: none"> <li>▪ Horn circuit malfunction</li> <li>▪ Keyless control module malfunction</li> <li>▪ Malfunction in wiring harness between keyless control module and horn relay</li> </ul> </li> <li>• Malfunction in hazard warning light system <ul style="list-style-type: none"> <li>▪ Hazard warning light circuit</li> <li>▪ Keyless control module malfunction</li> <li>▪ Malfunction in wiring harness between keyless control module and hazard warning lights</li> <li>▪ Malfunction in wiring harness between keyless control module and flasher control module</li> </ul> </li> <li>• Malfunction in door lock linkage</li> <li>• Malfunction in keyless control module door lock/unlock signal circuit <ul style="list-style-type: none"> <li>▪ Keyless control module malfunction</li> </ul> </li> </ul>

## Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>INSPECT HORN AND HAZARD WARNING LIGHT OPERATION DURING ON-BOARD DIAGNOSIS</b> <ul style="list-style-type: none"> <li>Do all of the following items work during on-board diagnostic function operation? <ul style="list-style-type: none"> <li>Hazard warning lights flash.</li> <li>Horns sounds intermittently.</li> <li>Trunk lid opens.</li> </ul> </li> </ul>	Yes	Go to step 11.
		No	Go to the next step.
2	<b>INSPECT HAZARD WARNING LIGHT OPERATION DURING ON-BOARD DIAGNOSIS</b> <ul style="list-style-type: none"> <li>Do the hazard warning lights flash during on-board diagnostic function operation?</li> </ul>	Yes	Go to step 5.
		No	Go to the next step.
3	<b>INSPECT HAZARD WARNING LIGHT CIRCUIT</b> <ul style="list-style-type: none"> <li>Do the hazard warning lights flash when hazard warning switch is on?</li> </ul>	Yes	Go to the next step.
		No	Inspect the hazard warning light circuit.
*4	<b>INSPECT IF MALFUNCTION IS IN WIRING HARNESS (BETWEEN KEYLESS CONTROL MODULE AND FLASHER CONTROL MODULE) OR KEYLESS CONTROL MODULE</b> <ul style="list-style-type: none"> <li>Measure the voltage at keyless control module connector terminal 3N during on-board diagnostic function operation. <ul style="list-style-type: none"> <li>When hazard warning lights flashed: <b>Alternates between B+ and below 1.0 V</b></li> </ul> </li> <li>Is the voltage as above?</li> </ul>	Yes	Reinspect the malfunction symptoms, then repeat from step 1 if malfunction recurs.
		No	<ul style="list-style-type: none"> <li>Inspect the wiring harness between the keyless control module and flasher control module. <ul style="list-style-type: none"> <li>If the wiring harness is normal, replace the keyless control module and reprogram the transmitter ID code, then go to step 14.</li> <li>If the wiring</li> </ul> </li> </ul>

			harness is malfunctioning, repair the wiring harness, then go to step 14.
5	<b>INSPECT HORN OPERATION DURING ON-BOARD DIAGNOSIS</b> <ul style="list-style-type: none"> <li>• Does horn sound intermittently during on-board diagnostic function operation?</li> </ul>	Yes	Go to step 8.
		No	Go to the next step.
6	<b>INSPECT HORN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Does horn sound when the horn switch on the vehicle is pressed?</li> </ul>	Yes	Go to the next step.
		No	Inspect the horn circuit.
*7	<b>INSPECT IF MALFUNCTION IS IN WIRING HARNESS (NO CONTINUITY BETWEEN KEYLESS CONTROL MODULE AND HORN RELAY) OR KEYLESS CONTROL MODULE</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Disconnect the keyless control module connector and horn relay connector.</li> <li>• Is there continuity between keyless control module connector terminal 4U and horn relay connector?</li> </ul>	Yes	Replace the keyless control module and reprogram the keyless control module ID code, then go to step 14.
		No	Repair the wiring harness between the keyless control module and horn relay, then go to step 14.
8	<b>CHECK TRUNK LID OPERATION DURING ON-BOARD DIAGNOSIS</b> <ul style="list-style-type: none"> <li>• Does the trunk lid open during on-board diagnostic function operation?</li> </ul>	Yes	Go to step 11.
		No	Go to the next step.
9	<b>INSPECT TRUNK LID OPENER SYSTEM</b> <ul style="list-style-type: none"> <li>• Does the trunk lid open by the trunk lid opener switch?</li> </ul>	Yes	Go to the next step.
		No	Inspect the trunk lid opener system.
*10	<b>INSPECT IF MALFUNCTION IS IN TRUNK LID OPENER RELAY CIRCUIT OR KEYLESS CONTROL MODULE</b> <ul style="list-style-type: none"> <li>• Disconnect the keyless control module connector.</li> </ul>	Yes	Replace the keyless control module and the reprogram transmitter ID code, then go to step 14.
		No	Inspect the trunk lid opener relay circuit.

	<p>Measure the voltage at keyless control module connector terminal 4P.</p> <ul style="list-style-type: none"> <li>Is the voltage <b>approx. 12 V</b>?</li> </ul>		
11	<p><b>VERIFY THAT ALL DOORS LOCK AND UNLOCK DURING ON-BOARD DIAGNOSIS</b></p> <ul style="list-style-type: none"> <li>Do all doors unlock and lock during on-board diagnostic function operation?</li> </ul>	Yes	Reinspect the malfunction symptoms, then repeat from step 1 if the malfunction recurs.
		No	Go to the next step.
12	<p><b>INSPECT DOOR LOCK LINKAGE</b></p> <ul style="list-style-type: none"> <li>Operate the door lock knob and verify the door locks and unlocks manually.</li> <li>Does every door lock system work?</li> </ul>	Yes	Go to the next step.
		No	Inspect the door lock linkage.
*13	<p><b>INSPECT IF MALFUNCTION IS IN DOOR LOCK ACTUATOR, KEYLESS CONTROL MODULE GROUND CIRCUIT OR ELSEWHERE</b></p> <ul style="list-style-type: none"> <li>Measure the voltage at keyless control module connector terminals 1C and 1A. <ul style="list-style-type: none"> <li>All doors locked: <b>Cycles 1.0 V or less →B+→1.0 V or less</b> (terminal 1C)</li> <li>All doors unlocked: <b>Cycles B+→1.0 V or less→B+</b> (terminal 1A)</li> </ul> </li> <li>Is the voltage as above?</li> </ul>	Yes	Reinspect the malfunction symptoms, then repeat from step 1 if the malfunction recurs.
		No	<ul style="list-style-type: none"> <li>Inspect the keyless control module the connector.</li> <li>Inspect the wiring harness between the keyless control module and door lock actuator. <ul style="list-style-type: none"> <li>If the above parts are normal, go to the next step.</li> <li>If any of above parts are malfunctioning, repair the malfunctioning part.</li> </ul> </li> </ul>
14	<p><b>REINSPECT MALFUNCTION SYMPTOM AFTER REPAIR</b></p> <ul style="list-style-type: none"> <li>Does the keyless entry system operate properly?</li> </ul>	Yes	<p>Troubleshooting completed.</p> <p>Explain repairs to customer.</p>
		No	Reinspect the malfunction symptoms, then repeat from step 1 if malfunction recurs.





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### NO.2 ALL ON-BOARD DIAGNOSTIC FUNCTIONS INOPERATIVE [KEYLESS ENTRY SYSTEM]

- When performing an asterisked (\*) troubleshooting inspection, slightly shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, verify that the connectors, terminals and wiring harnesses are connected correctly and undamaged.

<b>2</b>	<b>All on-board diagnostic functions inoperative</b>
<b>DESCRIPTION</b>	<ul style="list-style-type: none"> <li>• Malfunction in keyless control module power supply circuit, door switch circuit, trunk lid compartment light circuit, keyless control module ground circuit, or keyless receiver.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Malfunction in IG1 or B+ signal circuit of keyless control module <ul style="list-style-type: none"> <li>▪ Keyless control module power supply fuse malfunction</li> <li>▪ Malfunction in wiring harness between keyless control module power supply fuses and keyless control module</li> </ul> </li> <li>• Malfunction in door open/closed signal circuit of keyless control module <ul style="list-style-type: none"> <li>▪ Door switch system malfunction</li> <li>▪ Keyless control module malfunction</li> <li>▪ Malfunction in wiring harness between keyless control module and door switch</li> </ul> </li> <li>• Malfunction in trunk lid open signal circuit of keyless control module <ul style="list-style-type: none"> <li>▪ Trunk lid compartment light switch system malfunction</li> <li>▪ Keyless control module malfunction</li> <li>▪ Malfunction in wiring harness between keyless control module and trunk lid compartment light switch</li> </ul> </li> <li>• Malfunction in keyless control module GND signal circuit <ul style="list-style-type: none"> <li>▪ Malfunction in wiring harness between keyless control module and ground</li> </ul> </li> <li>• Malfunction in keyless receiver <ul style="list-style-type: none"> <li>▪ Keyless receiver malfunction</li> <li>▪ Malfunction in wiring harness between keyless control module and keyless receiver</li> </ul> </li> </ul>

## Diagnostic procedure

STEP	INSPECTION		ACTION
1	<b>INSPECT KEYLESS CONTROL MODULE POWER SUPPLY FUSES</b> <ul style="list-style-type: none"> <li>Are the keyless control module power supply fuses normal?</li> </ul>	Yes	Go to the next step.
		No	Inspect for a short to ground in circuit of blown fuse. Repair or replace if necessary.  Install an appropriate amperage fuse.
2	<b>INSPECT DOOR SWITCH INSTALLATION</b> <ul style="list-style-type: none"> <li>Are the door switches installed securely?</li> </ul>	Yes	Go to the next step.
		No	Install the door switches securely, then go back to step 5 of KEYLESS ENTRY SYSTEM PRELIMINARY INSPECTION.
*3	<b>INSPECT IF MALFUNCTION IS IN WIRING HARNESS (NO CONTINUITY BETWEEN FUSE BLOCK AND KEYLESS CONTROL MODULE) OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position.</li> <li>Measure the voltage at the following keyless control module connector terminals:               <ul style="list-style-type: none"> <li>IG1 signal (terminal 3B)</li> <li>B+ signal (terminal 1F)</li> </ul> </li> <li>Is the voltage <b>B+</b>?</li> </ul>	Yes	Go to the next step.
		No	Repair the wiring harness between the fuse block and keyless control module, then go to step 12.
*4	<b>INSPECT IF MALFUNCTION IS IN WIRING HARNESS (SHORT TO B+ BETWEEN FUSE BLOCK AND KEYLESS CONTROL MODULE, OR BETWEEN KEYLESS CONTROL MODULE AND GROUND) OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the keyless control module connector.</li> <li>Measure the voltage at the following keyless control module connector terminal:               <ul style="list-style-type: none"> <li>IG1 signal (terminal 3B)</li> </ul> </li> <li>Is the voltage <b>B+</b>?</li> </ul>	Yes	Repair the malfunctioning wiring harness, then go to step 12.
		No	Go to the next step.

*5	<b>INSPECT IF MALFUNCTION IS IN WIRING HARNESS (NO CONTINUITY BETWEEN KEYLESS CONTROL MODULE AND GROUND) OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>Is there continuity between keyless control module connector terminal 3C and ground?</li> </ul>	Yes	Go to the next step.
		No	Repair the wiring harness between the keyless control module and ground, then go to step 12.
6	<b>INSPECT FOR CHECK CODE 04 IN INSTRUMENT CLUSTER</b> <ul style="list-style-type: none"> <li>Inspect the door switch using the instrument cluster input/output check mode.  (See <b>INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE</b>.)</li> <li>Is DTC 04 displayed?</li> </ul>	Yes	Go to the next step.
		No	Repair the door switch system using the DTC 04 inspection procedure, then go to step 12.
7	<b>INSPECT KEYLESS CONTROL MODULE OR WIRING HARNESS (BETWEEN KEYLESS CONTROL MODULE AND DOOR SWITCHES, TRUNK LID COMPARTMENT LIGHT SWITCH FOR CONTINUITY)</b> <ul style="list-style-type: none"> <li>Open the driver-side door.</li> <li>Is there continuity between keyless control module connector terminal 4T, 4Q, 3Z and ground?</li> </ul>	Yes	Replace the keyless control module and reprogram the keyless control module ID code, then go to the next step.
		No	Repair the wiring harness between the keyless control module, door switches, and trunk lid compartment light switch, then go to the next step.
8	<b>INSPECT IF MALFUNCTION IS IN WIRING HARNESS (NO CONTINUITY BETWEEN FUSE BLOCK AND KEYLESS RECEIVER) OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position.</li> <li>Measure the voltage at the following keyless receiver terminal: <ul style="list-style-type: none"> <li>RF receiver power (terminal 1A)</li> </ul> </li> <li>Is the voltage <b>B+</b>?</li> </ul>	Yes	Go to the next step.
		No	Repair the wiring harness between the fuse block and keyless receiver, then go to step 12.
9	<b>INSPECT IF MALFUNCTION IS IN WIRING HARNESS (NO CONTINUITY BETWEEN KEYLESS RECEIVER AND GROUND) OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>Is there continuity between keyless receiver connector terminal 1E and ground?</li> </ul>	Yes	Go to the next step.
		No	Repair the wiring harness between the keyless receiver and ground, then go to step 12.
10	<b>INSPECT IF MALFUNCTION IS IN WIRING HARNESS (NO CONTINUITY BETWEEN KEYLESS RECEIVER AND KEYLESS CONTROL MODULE) OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position.</li> </ul>	Yes	Go to the next step.
		No	Repair the wiring harness between the keyless receiver and keyless

	<ul style="list-style-type: none"> <li>• Disconnect the keyless receiver connector and keyless control module.</li> <li>• Is there continuity between the following terminals? <ul style="list-style-type: none"> <li>▪ Terminal 1A—terminal 3S</li> <li>▪ Terminal 1C—terminal 3U</li> </ul> </li> </ul>		control module, then go to step 12.
11	<b>INSPECT IF MALFUNCTION IS IN WIRING HARNESS (NO CONTINUITY BETWEEN KEYLESS RECEIVER AND KEYLESS CONTROL MODULE) OR KEYLESS CONTROL MODULE</b> <ul style="list-style-type: none"> <li>• Measure the signal wave pattern for keyless receiver terminal 1C using an oscilloscope when the transmitter is operated with the key not inserted into the ignition key cylinder.</li> <li>• Does the wave pattern change when the transmitter is operated?</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• Perform the oscilloscope setting using 0.5V/DIV (Y), 100ms/DIV (X), DC range.</li> </ul>	Yes	Replace the keyless control module, then go to the next step.  (See <a href="#">KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [KEYLESS ENTRY SYSTEM]</a> .)
		No	Replace the keyless receiver, then go to the next step.  (See <a href="#">KEYLESS RECEIVER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> .)
12	<b>REINSPECT MALFUNCTION SYMPTOM AFTER REPAIR</b> <ul style="list-style-type: none"> <li>• Does the keyless entry system operate properly?</li> </ul>	Yes	Troubleshooting completed.  Explain repairs to the customer.
		No	Reinspect the malfunction symptoms, then repeat from step 1 if the malfunction recurs.

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### NO.3 TRANSMITTER ID CODE CANNOT BE REPROGRAMMED [KEYLESS ENTRY SYSTEM]

<b>3</b>	<b>Transmitter ID code cannot be reprogrammed</b>
<b>DESCRIPTION</b>	<ul style="list-style-type: none"> <li>• Malfunction in keyless receiver or keyless control module circuit.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Malfunction in keyless receiver related part <ul style="list-style-type: none"> <li>▪ Keyless receiver malfunction</li> <li>▪ Keyless receiver power supply fuse malfunction</li> <li>▪ Malfunction in wiring harness between keyless receiver and ground</li> <li>▪ Malfunction in wiring harness between keyless receiver power supply fuses and keyless receiver</li> <li>▪ Malfunction in wiring harness between keyless receiver and keyless control module</li> </ul> </li> <li>• Malfunction in keyless control module <ul style="list-style-type: none"> <li>▪ Malfunction in wiring harness between keyless receiver and keyless control module</li> <li>▪ Keyless control module malfunction</li> </ul> </li> </ul>

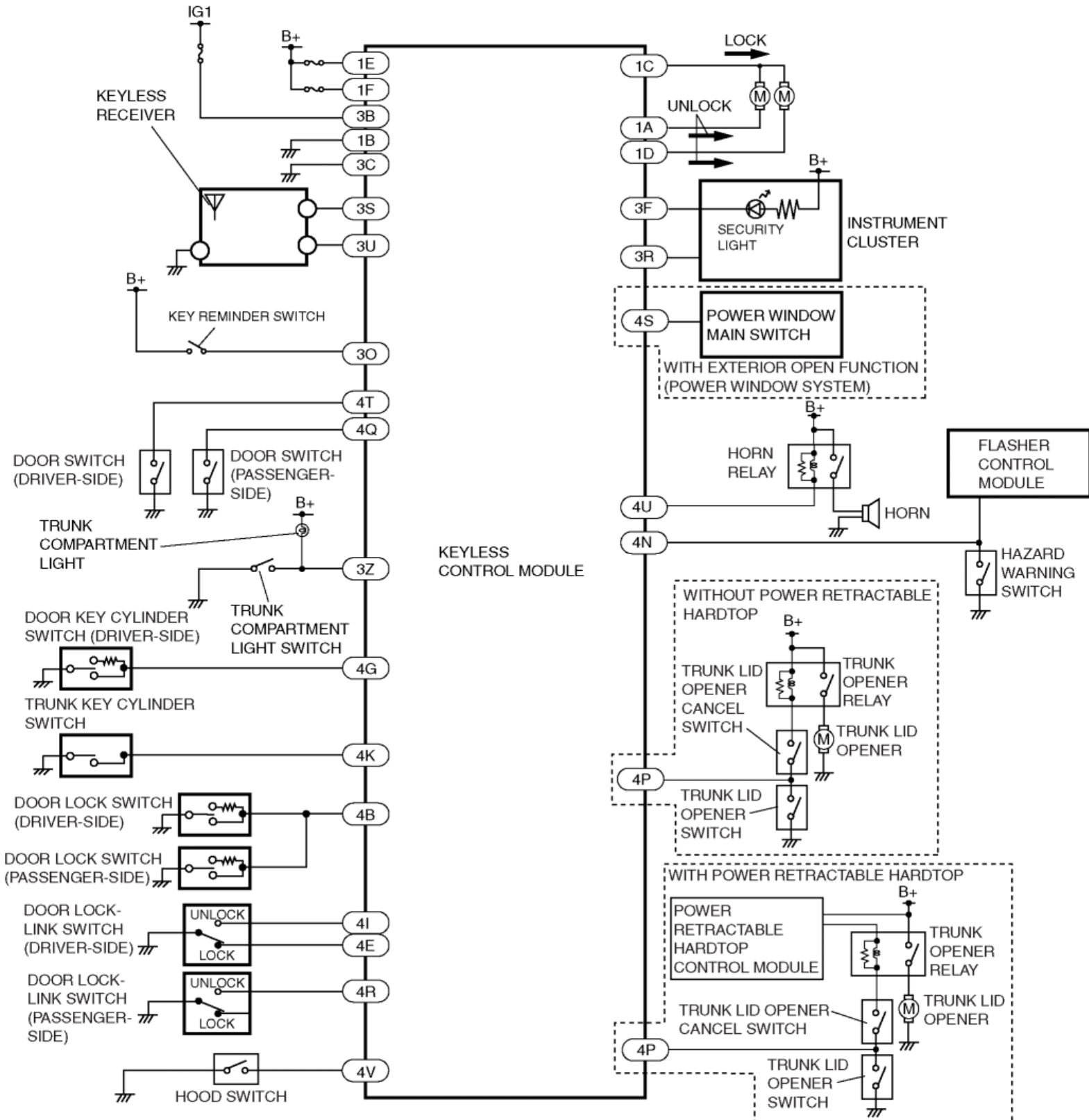
#### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT POWER SUPPLY FUSE</b> <ul style="list-style-type: none"> <li>• Is the keyless receiver power supply fuse normal?</li> </ul>	Yes Go to the next step.
		No Install an appropriate amperage fuse, then go to Step 6.
2	<b>INSPECT IF MALFUNCTION IS IN WIRING HARNESS (NO CONTINUITY BETWEEN FUSE BLOCK AND KEYLESS RECEIVER) OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>• Measure the voltage at the following keyless receiver terminal:</li> </ul>	Yes Go to the next step.
		No Repair the wiring harness between the fuse block and keyless receiver, then go to step 6.

	<ul style="list-style-type: none"> <li>▪ Power supply signal (terminal 1A)</li> </ul> <ul style="list-style-type: none"> <li>• Is the voltage <b>B+</b>?</li> </ul>		
3	<b>INSPECT IF MALFUNCTION IS IN WIRING HARNESS (NO CONTINUITY BETWEEN KEYLESS RECEIVER AND GROUND) OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>• Is there continuity between keyless receiver connector terminal 1E and ground?</li> </ul>	Yes	Go to the next step.
		No	Repair the wiring harness between the keyless receiver and ground, then go to step 6.
4	<b>INSPECT IF MALFUNCTION IS IN WIRING HARNESS (NO CONTINUITY BETWEEN KEYLESS RECEIVER AND KEYLESS CONTROL MODULE) OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>• Disconnect the keyless receiver connector and keyless control module.</li> <li>• Is there continuity between the following terminals? <ul style="list-style-type: none"> <li>▪ Terminal 1A—terminal 3S</li> <li>▪ Terminal 1C—terminal 3U</li> </ul> </li> </ul>	Yes	Go to the next step.
		No	Repair the wiring harness between the keyless receiver and keyless control module, then go to step 6.
5	<b>INSPECT IF MALFUNCTION IS IN WIRING HARNESS (NO CONTINUITY BETWEEN KEYLESS RECEIVER AND KEYLESS CONTROL MODULE) OR KEYLESS CONTROL MODULE</b> <ul style="list-style-type: none"> <li>• Measure the signal wave pattern for keyless receiver terminal 1C using an oscilloscope when the transmitter is operated with the key not inserted into the ignition key cylinder.</li> <li>• Does the wave pattern change when the transmitter is operated?</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• Perform the oscilloscope setting using 0.5V/DIV (Y), 100ms/DIV (X), DC range.</li> </ul>	Yes	Replace the keyless control module, then go to the next step.  (See <a href="#">KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [KEYLESS ENTRY SYSTEM]</a> .)
		No	Replace the keyless receiver, then go to the next step.  (See <a href="#">KEYLESS RECEIVER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> .)
6	<b>REINSPECT MALFUNCTION SYMPTOM AFTER REPAIR</b> <ul style="list-style-type: none"> <li>• Does the keyless entry system operate properly?</li> </ul>	Yes	Troubleshooting completed.  Explain repairs to the customer.
		No	Reinspect the malfunction symptoms, then repeat from step 1 if the malfunction recurs.

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### KEYLESS ENTRY SYSTEM WIRING DIAGRAM [KEYLESS ENTRY SYSTEM]







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## 2008 - MX-5 - Body and Accessories

### SYMPTOM TROUBLESHOOTING CHART [KEYLESS ENTRY SYSTEM]

No.	Troubleshooting item	Description
1	One or more on-board diagnostic functions inoperative	<ul style="list-style-type: none"><li>• Malfunction in trunk lid opener system, horn system, hazard warning light system, or door lock linkage system</li></ul>
2	All on-board diagnostic functions inoperative	<ul style="list-style-type: none"><li>• Malfunction in keyless control module power supply circuit, door switch circuit, keyless control module ground circuit</li></ul>
3	Transmitter ID code cannot be reprogrammed	<ul style="list-style-type: none"><li>• Malfunction in keyless receiver or keyless control module circuit.</li></ul>

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## 2008 - MX-5 - Body and Accessories

### SYMPTOM TROUBLESHOOTING [INSTRUMENT CLUSTER]

No.	TROUBLESHOOTING ITEM	PAGE
1	Fuel gauge needle position incorrect	(See <b>NO. 1 FUEL GAUGE NEEDLE POSITION INCORRECT [INSTRUMENT CLUSTER].</b> )
2	All meters and gauges do not operate	(See <b>NO. 2 ALL METERS AND GAUGES DO NOT OPERATE [INSTRUMENT CLUSTER].</b> )
3	ABS warning light illuminates	(See <b>NO. 3 ABS WARNING LIGHT ILLUMINATES [INSTRUMENT CLUSTER].</b> )
4	MIL illuminates	(See <b>NO. 4 MIL ILLUMINATES [INSTRUMENT CLUSTER].</b> )
5	Brake system warning light illuminates	(See <b>NO. 5 BRAKE SYSTEM WARNING LIGHT ILLUMINATES [INSTRUMENT CLUSTER].</b> )
6	Instrument cluster illumination does not illuminate	(See <b>NO. 6 INSTRUMENT CLUSTER ILLUMINATION DOES NOT ILLUMINATE [INSTRUMENT CLUSTER].</b> )
7	Speedometer indication is defective	(See <b>NO. 7 SPEEDOMETER INDICATION IS DEFECTIVE [INSTRUMENT CLUSTER].</b> )
8	Tachometer indication is defective	(See <b>NO. 8 TACHOMETER INDICATION IS DEFECTIVE [INSTRUMENT CLUSTER].</b> )
9	Water temperature gauge indication is defective	(See <b>NO. 9 WATER TEMPERATURE GAUGE INDICATION IS DEFECTIVE [INSTRUMENT CLUSTER].</b> )
10	Oil pressure gauge indication is defective (oil pressure gauge needle does not move from the L position or less)	(See <b>NO. 10 OIL PRESSURE GAUGE INDICATION IS DEFECTIVE (OIL PRESSURE GAUGE NEEDLE DOES NOT MOVE FROM THE L POSITION OR LESS) [INSTRUMENT CLUSTER].</b> )

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### QUICK DIAGNOSTIC CHART [INSTRUMENT CLUSTER]

X: Applicable

Troubleshooting item		Possible factor																								
No.		Poor connection of fuel gauge sender unit connector, terminal damage	Poor connection of instrument cluster connector, terminal damage	Fuel gauge sender unit	Instrument cluster	Fuel gauge sender unit is improperly installed	Open or short circuit in wiring harness between instrument cluster and GND	Open or short circuit in wiring harness between instrument cluster and fuel gauge sender unit	Fuse malfunction (METER)	Open or short circuit in power supply (IG1) wiring harness	Open or short circuit in GND wiring harness ABS HU/CM or DSC HU/CM	Poor connection of ABS HU/CM or DSC HU/CM connector, terminal damage	ABS HU/CM or DSC HU/CM	Short circuit in wiring harness between CAN-L, CAN-H and GND	Open circuit in CAN wiring harness (CAN-L, CAN-H)	CAN wiring harness (CAN-L, CAN-H) short each other	Poor connection of PCM connector, terminal damage	PCM	Poor connection of brake fluid level sensor connector, terminal damage	Brake fluid level sensor	Poor connection of Parking brake switch connector, terminal damage	Parking brake switch	Fuse malfunction (ROOM, ILLUMI)	Poor connection of oil pressure switch connector, terminal damage	Oil pressure switch	
1	Fuel gauge needle position incorrect	X	X	X	X	X	X	X																		
2	All meters and gauges do not operate		X		X				X	X	X															
3	ABS warning light illuminates		X		X							X	X	X	X	X										
4	MIL illuminates		X		X									X	X	X	X	X								
5	Brake system warning light illuminates		X		X							X	X	X	X	X			X	X	X	X				
6	Instrument cluster illumination does not illuminate		X		X																			X		
7	Speedometer indication is defective		X		X							X	X	X	X	X	X	X								
8	Tachometer indication is defective		X		X									X	X	X	X	X								
9	Water temperature gauge indication is defective		X		X									X	X	X	X	X								
10	Oil pressure gauge indication is defective (oil pressure gauge needle does not move from the L position or less)		X		X									X	X	X	X	X						X	X	



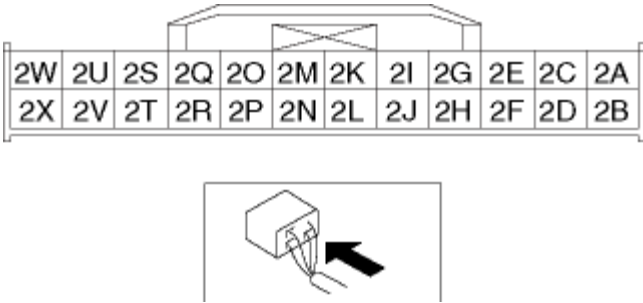
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### NO. 1 FUEL GAUGE NEEDLE POSITION INCORRECT [INSTRUMENT CLUSTER]

1	Fuel gauge needle position incorrect
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Fuel gauge sender unit malfunction</li> <li>Instrument cluster malfunction</li> <li>Connector or pin malfunction</li> <li>Fuel gauge sender unit is improperly installed</li> <li>Open or short circuit in wiring harness between instrument cluster and GND</li> <li>Open or short circuit in wiring harness between instrument cluster and fuel gauge sender unit</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position.</li> <li>Verify that the fuel gauge needle does not move after ignition switch is turned off, or the display does not indicate F even though fuel tank is full.</li> <li>Is the fuel gauge normal?</li> </ul>	Yes Troubleshooting completed.
		No Go to the next step.
2	<ul style="list-style-type: none"> <li>Start the instrument cluster input/output check mode.</li> <li>Select the check code 22.</li> <li>Display value is <b>7—206</b>?</li> </ul>	Yes Go to the next step.
		No Go to Step 4.
3	<ul style="list-style-type: none"> <li>Perform the check code 23 inspection.</li> <li>Is there any malfunction?</li> </ul>	Yes Replace the instrument cluster.
		No Go to the next step.
4	<ul style="list-style-type: none"> <li>Perform the check code 22 inspection.</li> </ul>	Yes Go to the next step.

	<ul style="list-style-type: none"><li>Is there any malfunction?</li></ul>	No	Go to Step 6.
5	<ul style="list-style-type: none"><li>Turn the ignition switch off.</li><li>Inspect the instrument cluster connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion).</li><li>Are the terminals normal?</li></ul>	Yes	Replace the instrument cluster.
		No	Repair or replace the terminal.
6	<ul style="list-style-type: none"><li>Turn the ignition switch to LOCK position.</li><li>Remove the instrument cluster.</li><li>Disconnect the instrument cluster connector.</li><li>Inspect for continuity between the following wiring harnesses.<ul style="list-style-type: none"><li>2R terminal—GND</li><li>2T terminal—GND</li></ul></li><li>Is there continuity?</li></ul>	Yes	Repair or replace the wiring harness between the instrument cluster and GND.
		No	Go to the next step.
7	<ul style="list-style-type: none"><li>Turn the ignition switch off.</li><li>Inspect the fuel gauge sender unit connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion).</li><li>Are the terminals normal?</li></ul>	Yes	Go to the next step.
		No	Repair or replace the terminal.
8	<ul style="list-style-type: none"><li>Turn the ignition switch to LOCK position.</li><li>Inspect for continuity following the wiring harness between instrument cluster and fuel gauge sender unit.<ul style="list-style-type: none"><li>2R terminal—C terminal</li><li>2T terminal—A terminal</li></ul></li><li>Is there continuity?</li></ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness between the instrument cluster and the fuel gauge sender unit.
9	<ul style="list-style-type: none"><li>Turn the ignition switch off.</li></ul>	Yes	Inspect the fuel gauge sender unit.

	<ul style="list-style-type: none"><li>• Is the fuel gauge sender unit installed properly?</li></ul>		
			No Reinstall the fuel gauge sender unit.

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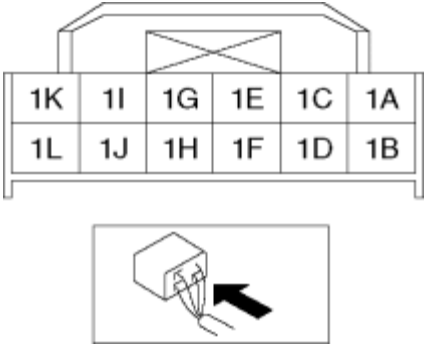
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### NO. 2 ALL METERS AND GAUGES DO NOT OPERATE [INSTRUMENT CLUSTER]

2	All meters and gauges do not operate
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>• Instrument cluster malfunction</li> <li>• Connector or pin malfunction</li> <li>• Fuse malfunction</li> <li>• Open or short circuit in power supply (IG1) wiring harness</li> <li>• Open or short circuit in GND wiring harness</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position.</li> <li>• Inspect the following: <ul style="list-style-type: none"> <li>▪ Does the odometer/tripmeter illuminate?</li> <li>▪ Does the fuel gauge operate?</li> <li>▪ Does the MIL turn off within <b>approx. 3 s</b>?</li> </ul> </li> </ul>	Yes	Troubleshooting completed.
		No	Go to the next step.
2	<ul style="list-style-type: none"> <li>• Inspect the METER fuse.</li> <li>• Is the fuse normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the fuse. <ul style="list-style-type: none"> <li>• If the fuse is melted, inspect the wiring harness for a short to ground. Repair or replace the wiring harness, then replace the fuse.</li> </ul>

3	<ul style="list-style-type: none"> <li>• Turn the ignition switch to LOCK position.</li> <li>• Remove the instrument cluster.</li> <li>• Disconnect the instrument cluster connector.</li> <li>• Inspect the voltage between instrument cluster wiring harness-side connector terminal 1G and terminal 1E.</li> <li>• Turn the ignition switch to the ON position.</li> <li>• Is the voltage <b>B+</b>?</li> </ul>	Yes	Go to the next step.
		No	Inspect the suspect wiring harness, then repair or replace.
4	<ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Inspect the instrument cluster connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion).</li> <li>• Are the terminals normal?</li> </ul>	Yes	Replace the instrument cluster.
		No	Repair or replace the terminal.

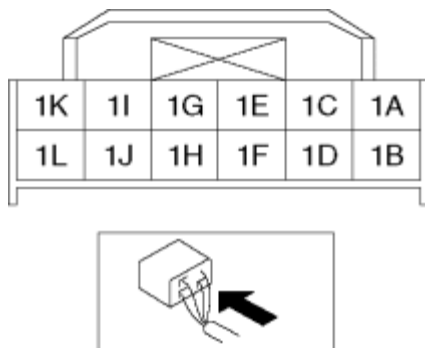
## 2008 - MX-5 - Body and Accessories

### NO. 3 ABS WARNING LIGHT ILLUMINATES [INSTRUMENT CLUSTER]

3	ABS warning light illuminates
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• ABS HU/CM or DSC HU/CM malfunction</li> <li>• Instrument cluster malfunction</li> <li>• Connector or pin malfunction</li> <li>• Short circuit in wiring harness between CAN-L, CAN-H and GND</li> <li>• Open circuit in CAN wiring harness (CAN-L, CAN-H)</li> <li>• CAN wiring harness (CAN-L, CAN-H) short each other</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>• Start the engine.</li> <li>• Does the ABS warning light turn off?</li> </ul>	Yes Troubleshooting completed.
		No Go to the next step.
2	<ul style="list-style-type: none"> <li>• Are there a number of warning lights illuminated?</li> </ul>	Yes Go to Step 4.
		No Go to the next step.
3	<ul style="list-style-type: none"> <li>• Start the instrument cluster input/output check mode.</li> <li>• Does the ABS warning light turn off with a check code other than 26?</li> </ul>	Yes Inspect the ABS HU/CM or DSC HU/CM.
		No Replace the instrument cluster.
4	<ul style="list-style-type: none"> <li>• Disconnect the negative battery cable.</li> <li>• Measure the resistance between the DLC-2 terminals F and E.</li> <li>• Is the resistance <b>54—66 ohms</b>?</li> </ul>	Yes Go to the next step.
		No Go to Step 6.

5	<ul style="list-style-type: none"><li>Inspect the DLC-2 terminals F and E for short to power supply or GND.</li><li>Is there any malfunction?</li></ul>	Yes	Inspect the wiring harness and CAN system-related module.  Repair or replace the malfunctioning part.
		No	Replace the instrument cluster.
6	<ul style="list-style-type: none"><li>Turn the ignition switch off.</li><li>Inspect the instrument cluster connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion).</li><li>Are the terminals normal?</li></ul> <div></div>	Yes	Go to the next step.
		No	Repair or replace the terminal.
7	<ul style="list-style-type: none"><li>Disconnect the negative battery cable.</li><li>Measure the resistance between the instrument cluster connector terminals 1J and 1L.</li><li>Is the resistance <b>114—126 ohms</b>?</li></ul>	Yes	Inspect the wiring harness and CAN system-related module.  Repair or replace the malfunctioning part.
		No	Replace the instrument cluster.

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### NO. 4 MIL ILLUMINATES [INSTRUMENT CLUSTER]

4	MIL illuminates
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>• PCM malfunction</li> <li>• Instrument cluster malfunction</li> <li>• Connector or pin malfunction</li> <li>• Short circuit in wiring harness between CAN-L, CAN-H and GND</li> <li>• Open circuit in CAN wiring harness (CAN-L, CAN-H)</li> <li>• CAN wiring harness (CAN-L, CAN-H) short each other</li> </ul>

### Diagnostic procedure

STEP	INSPECTION		ACTION
1	<ul style="list-style-type: none"> <li>• Start the engine.</li> <li>• Does the MIL turn off?</li> </ul>	Yes	Troubleshooting completed.
		No	Go to the next step.
2	<ul style="list-style-type: none"> <li>• Are there a number of warning lights illuminated?</li> </ul>	Yes	Go to Step 4.
		No	Go to the next step.
3	<ul style="list-style-type: none"> <li>• Start the instrument cluster input/output check mode.</li> <li>• Does the MIL turn off with a check code other than 26?</li> </ul>	Yes	Inspect the PCM.
		No	Replace the instrument cluster.
4	<ul style="list-style-type: none"> <li>• Disconnect the negative battery cable.</li> <li>• Measure the resistance between the DLC-2 terminals F and E.</li> <li>• Is the resistance <b>54—66 ohms</b>?</li> </ul>	Yes	Go to the next step.
		No	Go to Step 6.

5	<p>Inspect the DLC-2 terminals F and E for short to power supply or GND.</p> <ul style="list-style-type: none"> <li>Is there any malfunction?</li> </ul>	Yes	<p>Inspect the wiring harness and CAN system-related module.</p> <p>Repair or replace the malfunctioning part.</p>
		No	Replace the instrument cluster.
6	<ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Inspect the instrument cluster connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion).</li> <li>Are the terminals normal?</li> </ul> <div> </div>	Yes	Go to the next step.
		No	Repair or replace the terminal.
7	<ul style="list-style-type: none"> <li>Disconnect the negative battery cable.</li> <li>Measure the resistance between the instrument cluster connector terminals 1J and 1L.</li> <li>Is the resistance <b>114—126 ohms</b>?</li> </ul>	Yes	<p>Inspect the wiring harness and CAN system-related module.</p> <p>Repair or replace the malfunctioning part.</p>
		No	Replace the instrument cluster.

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### NO. 5 BRAKE SYSTEM WARNING LIGHT ILLUMINATES [INSTRUMENT CLUSTER]

5	Brake system warning light illuminates
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• ABS HU/CM or DSC HU/CM malfunction</li> <li>• Brake fluid level sensor malfunction</li> <li>• Parking brake switch malfunction</li> <li>• Instrument cluster malfunction</li> <li>• Connector or pin malfunction</li> <li>• Short circuit in wiring harness between CAN-L, CAN-H and GND</li> <li>• Open circuit in CAN wiring harness (CAN-L, CAN-H)</li> <li>• CAN wiring harness (CAN-L, CAN-H) short each other</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<ul style="list-style-type: none"> <li>• Start the engine.</li> <li>• Release the parking brake.</li> <li>• Does the brake system warning light turn off?</li> </ul>	Yes	Troubleshooting completed.
		No	Go to the next step.
2	<ul style="list-style-type: none"> <li>• Are there a number of warning lights illuminated?</li> </ul>	Yes	Go to Step 5.
		No	Go to the next step.
3	<ul style="list-style-type: none"> <li>• Does the brake fluid need replenishment?</li> </ul>	Yes	Add brake fluid.
		No	Go to the next step.
4	<ul style="list-style-type: none"> <li>• Start the instrument cluster input/output check mode.</li> <li>• Does the brake system warning light turn</li> </ul>	Yes	Inspect the ABS HU/CM, DSC HU/CM, brake fluid level sensor, parking brake switch or connectors.

	off with a check code other than 26?		No Replace the instrument cluster.
5	<ul style="list-style-type: none"><li>• Disconnect the negative battery cable.</li><li>• Measure the resistance between the DLC-2 terminals F and E.</li><li>• Is the resistance <b>54—66 ohms</b>?</li></ul>	Yes	Go to the next step.
		No	Go to Step 7.
6	<ul style="list-style-type: none"><li>• Disconnect the negative battery cable.</li><li>• Inspect the DLC-2 terminals F and E for short to power supply or GND.</li><li>• Is there any malfunction?</li></ul>	Yes	Inspect the wiring harness and CAN system-related module.  Repair or replace the malfunctioning part.
		No	Replace the instrument cluster.
7	<ul style="list-style-type: none"><li>• Turn the ignition switch off.</li><li>• Inspect the instrument cluster connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion).</li><li>• Are the terminals normal?</li></ul> <div></div>	Yes	Go to the next step.
		No	Repair or replace the terminal.
8	<ul style="list-style-type: none"><li>• Disconnect the negative battery cable.</li><li>• Measure the resistance between the instrument cluster connector terminals 1J and 1L.</li><li>• Is the resistance <b>114—126 ohms</b>?</li></ul>	Yes	Inspect the wiring harness and CAN system-related module.  Repair or replace the malfunctioning part.
		No	Replace the instrument cluster.



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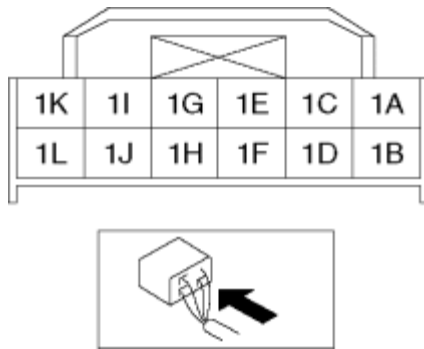
### NO. 6 INSTRUMENT CLUSTER ILLUMINATION DOES NOT ILLUMINATE [INSTRUMENT CLUSTER]

6	Instrument cluster illumination does not illuminate
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Instrument cluster malfunction</li> <li>• Connector or pin malfunction</li> <li>• Fuse malfunction</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<ul style="list-style-type: none"> <li>• Turn the light switch to the TNS position.</li> <li>• Does the instrument cluster illumination turn on?</li> </ul>	Yes	Troubleshooting completed.
		No	Go to the next step.
2	<ul style="list-style-type: none"> <li>• Does the non-illumination include the entire instrument cluster?</li> </ul>	Yes	Go to the next step.
		No	Replace the instrument cluster.
3	<ul style="list-style-type: none"> <li>• Inspect the ROOM and ILLUMI fuse.</li> <li>• Are the fuses normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the fuse. <ul style="list-style-type: none"> <li>• If the fuse is melted, inspect the wiring harness for short to ground. Repair or replace the wiring harness, then replace the fuse.</li> </ul>
4	<ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Inspect the instrument cluster connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion).</li> </ul>	Yes	Replace the instrument cluster.

- Are the terminals normal?



No Repair or replace the terminal.

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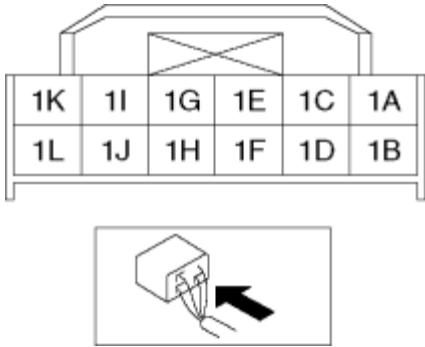
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### NO. 7 SPEEDOMETER INDICATION IS DEFECTIVE [INSTRUMENT CLUSTER]

7	Speedometer indication is defective
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• ABS HU/CM or DSC HU/CM malfunction</li> <li>• PCM malfunction</li> <li>• Instrument cluster malfunction</li> <li>• Connector or pin malfunction</li> <li>• Short circuit in wiring harness between CAN-L, CAN-H and GND</li> <li>• Open circuit in CAN wiring harness (CAN-L, CAN-H)</li> <li>• CAN wiring harness (CAN-L, CAN-H) short each other</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<ul style="list-style-type: none"> <li>• Start the engine, and drive the vehicle. <ul style="list-style-type: none"> <li>▪ Does the speedometer needle move smoothly?</li> <li>▪ Does the speedometer needle indicate correct speed?</li> </ul> </li> </ul>	Yes	Troubleshooting completed.
		No	Go to the next step.
2	<ul style="list-style-type: none"> <li>• Do the tachometer, the water temperature gauge, and the oil pressure gauge operate normally?</li> </ul>	Yes	Go to the next step.
		No	Go to Step 4.
3	<ul style="list-style-type: none"> <li>• Start the instrument cluster input/output check mode.</li> <li>• Inspect the speedometer using the check code 12.</li> <li>• Is the speedometer normal?</li> </ul>	Yes	Inspect the ABS HU/CM, DSC HU/CM, or connectors.
		No	Replace the instrument cluster.
4	<ul style="list-style-type: none"> <li>• Start the engine.</li> </ul>	Yes	Inspect the PCM or connectors.

	Does the ABS warning light turn off?		No Replace the instrument cluster.
5	<ul style="list-style-type: none"><li>• Disconnect the negative battery cable.</li><li>• Measure the resistance between the DLC-2 terminals F and E.</li><li>• Is the resistance <b>54—66 ohms</b>?</li></ul>	Yes	Go to the next step.
		No	Go to Step 7.
6	<ul style="list-style-type: none"><li>• Disconnect the negative battery cable.</li><li>• Inspect the DLC-2 terminals F and E for short to power supply or GND.</li><li>• Is there any malfunction?</li></ul>	Yes	Inspect the wiring harness and CAN system-related module.  Repair or replace the malfunctioning part.
		No	Replace the instrument cluster.
7	<ul style="list-style-type: none"><li>• Turn the ignition switch off.</li><li>• Inspect the instrument cluster connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion).</li><li>• Are the terminals normal?</li></ul> <div></div>	Yes	Go to the next step.
		No	Repair or replace the terminal.
8	<ul style="list-style-type: none"><li>• Disconnect the negative battery cable.</li><li>• Measure the resistance between the instrument cluster connector terminals 1J and 1L.</li><li>• Is the resistance <b>114—126 ohms</b>?</li></ul>	Yes	Inspect the wiring harness and CAN system-related module.  Repair or replace the malfunctioning part.
		No	Replace the instrument cluster.



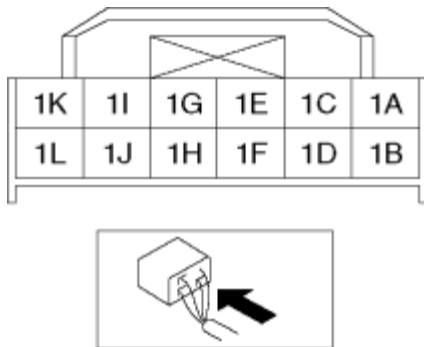
## 2008 - MX-5 - Body and Accessories

### NO. 8 TACHOMETER INDICATION IS DEFECTIVE [INSTRUMENT CLUSTER]

8	Tachometer indication is defective
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>• PCM malfunction</li> <li>• Instrument cluster malfunction</li> <li>• Connector or pin malfunction</li> <li>• Short circuit in wiring harness between CAN-L, CAN-H and GND</li> <li>• Open circuit in CAN wiring harness (CAN-L, CAN-H)</li> <li>• CAN wiring harness (CAN-L, CAN-H) short each other</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION		ACTION
1	<ul style="list-style-type: none"> <li>• Start the engine. <ul style="list-style-type: none"> <li>▪ Does the tachometer needle move smoothly?</li> <li>▪ Does the tachometer needle indicate correct engine speed?</li> </ul> </li> </ul>	Yes	Troubleshooting completed.
		No	Go to the next step.
2	<ul style="list-style-type: none"> <li>• Do the speedometer, the water temperature gauge, and the oil pressure gauge operate normally?</li> </ul>	Yes	Go to the next step.
		No	Go to Step 4.
3	<ul style="list-style-type: none"> <li>• Start the instrument cluster input/output check mode.</li> <li>• Inspect the tachometer using the check code 13.</li> <li>• Is the tachometer normal?</li> </ul>	Yes	Inspect the PCM or connectors.
		No	Replace the instrument cluster.
4	<ul style="list-style-type: none"> <li>• Start the engine.</li> <li>• Does the ABS warning light turn off?</li> </ul>	Yes	Inspect the PCM or connectors.

		No	Replace the instrument cluster.
5	<ul style="list-style-type: none"><li>• Disconnect the negative battery cable.</li><li>• Measure the resistance between the DLC-2 terminals F and E.</li><li>• Is the resistance <b>54—66 ohms</b>?</li></ul>	Yes	Go to the next step.
		No	Go to Step 7.
6	<ul style="list-style-type: none"><li>• Disconnect the negative battery cable.</li><li>• Inspect the DLC-2 terminals F and E for short to power supply or GND.</li><li>• Is there any malfunction?</li></ul>	Yes	Inspect the wiring harness and CAN system-related module.  Repair or replace the malfunctioning part.
		No	Replace the instrument cluster.
7	<ul style="list-style-type: none"><li>• Turn the ignition switch off.</li><li>• Inspect the instrument cluster connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion).</li><li>• Are the terminals normal?</li></ul> <div></div>	Yes	Go to the next step.
		No	Repair or replace the terminal.
8	<ul style="list-style-type: none"><li>• Disconnect the negative battery cable.</li><li>• Measure the resistance between the instrument cluster connector terminals 1J and 1L.</li><li>• Is the resistance <b>114—126 ohms</b>?</li></ul>	Yes	Inspect the wiring harness and CAN system-related module.  Repair or replace the malfunctioning part.
		No	Replace the instrument cluster.





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### NO. 9 WATER TEMPERATURE GAUGE INDICATION IS DEFECTIVE [INSTRUMENT CLUSTER]

9	Water temperature gauge indication is defective
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• PCM malfunction</li> <li>• Instrument cluster malfunction</li> <li>• Connector or pin malfunction</li> <li>• Short circuit in wiring harness between CAN-L, CAN-H and GND</li> <li>• Open circuit in CAN wiring harness (CAN-L, CAN-H)</li> <li>• CAN wiring harness (CAN-L, CAN-H) short each other</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>• Start the engine.</li> <li>• Does the water temperature gauge needle move to medium range gradually and stay there?</li> </ul>	Yes Troubleshooting completed.
		No Go to the next step.
2	<ul style="list-style-type: none"> <li>• Do the speedometer, the tachometer, and the oil pressure gauge operate normally?</li> </ul>	Yes Go to the next step.
		No Go to Step 4.
3	<ul style="list-style-type: none"> <li>• Start the instrument cluster input/output check mode.</li> <li>• Inspect the water temperature gauge using the check code 25.</li> <li>• Is the water temperature gauge normal?</li> </ul>	Yes Inspect the PCM or connectors.
		No Replace the instrument cluster.
4	<ul style="list-style-type: none"> <li>• Start the engine.</li> <li>• Does the ABS warning light turn off?</li> </ul>	Yes Inspect the PCM or connectors.
		No Replace the instrument cluster.

5	<ul style="list-style-type: none"><li>• Disconnect the negative battery cable.</li><li>• Measure the resistance between the DLC-2 terminals F and E.</li><li>• Is the resistance <b>54—66 ohms</b>?</li></ul>	Yes	Go to the next step.
		No	Go to Step 7.
6	<ul style="list-style-type: none"><li>• Disconnect the negative battery cable.</li><li>• Inspect the DLC-2 terminals F and E for short to power supply or GND.</li><li>• Is there any malfunction?</li></ul>	Yes	Inspect the wiring harness and CAN system-related module.  Repair or replace the malfunctioning part.
		No	Replace the instrument cluster.
7	<ul style="list-style-type: none"><li>• Turn the ignition switch off.</li><li>• Inspect the instrument cluster connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion).</li><li>• Are the terminals normal?</li></ul> <div></div>	Yes	Go to the next step.
		No	Repair or replace the terminal.
8	<ul style="list-style-type: none"><li>• Disconnect the negative battery cable.</li><li>• Measure the resistance between the instrument cluster connector terminals 1J and 1L.</li><li>• Is the resistance <b>114—126 ohms</b>?</li></ul>	Yes	Inspect the wiring harness and CAN system-related module.  Repair or replace the malfunctioning part.
		No	Replace the instrument cluster.

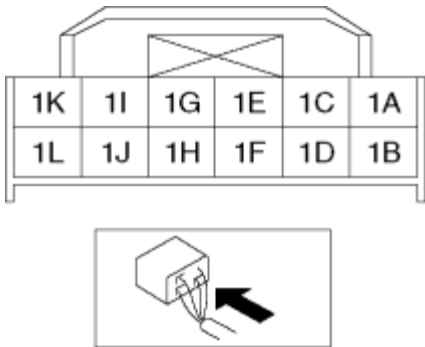
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### NO. 10 OIL PRESSURE GAUGE INDICATION IS DEFECTIVE (OIL PRESSURE GAUGE NEEDLE DOES NOT MOVE FROM THE L POSITION OR LESS) [INSTRUMENT CLUSTER]

10	Oil pressure gauge indication is defective (oil pressure gauge needle does not move from the L position or less)
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• PCM malfunction</li> <li>• Instrument cluster malfunction</li> <li>• Oil pressure switch malfunction</li> <li>• Connector or pin malfunction</li> <li>• Short circuit in wiring harness between CAN-L, CAN-H and GND</li> <li>• Open circuit in CAN wiring harness (CAN-L, CAN-H)</li> <li>• CAN wiring harness (CAN-L, CAN-H) short each other</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>• Start the engine.</li> <li>• Does the oil pressure gauge needle indicate L position or more?</li> </ul>	Yes Troubleshooting completed.
		No Go to the next step.
2	<ul style="list-style-type: none"> <li>• Do the speedometer, the tachometer, and the water temperature gauge operate normally?</li> </ul>	Yes Go to the next step.
		No Go to Step 5.
3	<ul style="list-style-type: none"> <li>• Does the engine oil need replenishment?</li> </ul>	Yes Add the engine oil.
		No Go to the next step.
4	<ul style="list-style-type: none"> <li>• Start the instrument cluster input/output check mode.</li> <li>• Inspect the oil pressure gauge using the check code 28.</li> </ul>	Yes Inspect the PCM, oil pressure switch, or connectors.

	<ul style="list-style-type: none"><li>Is the oil pressure gauge normal?</li></ul>	No	Replace the instrument cluster.
5	<ul style="list-style-type: none"><li>Start the engine.</li><li>Does the ABS warning light turn off?</li></ul>	Yes	Inspect the PCM or connectors.
		No	Go to the next step.
6	<ul style="list-style-type: none"><li>Disconnect the negative battery cable.</li><li>Measure the resistance between the DLC-2 terminals F and E.</li><li>Is the resistance <b>54—66 ohms</b>?</li></ul>	Yes	Go to the next step.
		No	Go to Step 8.
7	<ul style="list-style-type: none"><li>Disconnect the negative battery cable.</li><li>Inspect the DLC-2 terminals F and E for short to power supply or GND.</li><li>Is there any malfunction?</li></ul>	Yes	Inspect the wiring harness and CAN system-related module.  Repair or replace the malfunctioning part.
		No	Replace the instrument cluster.
8	<ul style="list-style-type: none"><li>Turn the ignition switch off.</li><li>Inspect the instrument cluster connector terminals for poor connection (such as damaged/pulled-out pins, and corrosion).</li><li>Are the terminals normal?</li></ul> <div></div>	Yes	Go to the next step.
		No	Repair or replace the terminal.
9	<ul style="list-style-type: none"><li>Disconnect the negative battery cable.</li><li>Measure the resistance between the instrument cluster connector terminals 1J and 1L.</li><li>Is the resistance <b>114—126 ohms</b>?</li></ul>	Yes	Inspect the wiring harness and CAN system-related module.  Repair or replace the malfunctioning part.
		No	Replace the instrument cluster.



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FOREWORD [AUDIO]

NOTE:

- Note down all radio programs set by the customer prior to the repairs. Reset all radio programs and adjust the time after the repairs.

Troubleshooting Index

No.	Symptom	Possible DTC
1	AF noise or POP noise at all sources (Radio, CD)	09:Er20, 09:Er21
2	No power to the entire audio system	09:Er20
3	No sound from all the speakers	03:Er07, 03:Er10, 06:Er07, 06:Er10, 09:Er20, 09:Er21, 10:Er10, 22:Er07, 22:Er10
4	No sound from some speakers	—
5	Sound break-up or poor sound quality	09:Er21
6	Volume increases/decreases while driving the vehicle	—
7	ALC function is inoperative	—
8	AudioPilot function is inoperative	—
9	No audio system illumination	09:Er20, 21:Er19

Quick Diagnostic Chart (Entire Audio System)

X: Applicable

Troubleshooting item	1	2	3	4	5	6	7	8	9
	all sources (Radio, CD)	io system	ikers	kers	und quality	es while driving the vehicle		irative	on

Possible factor	AF noise or POP noise at ε	No power to the entire audi	No sound from all the spea	No sound from some speal	Sound break-up or poor so	Volume increases/decreas	ALC function is inoperative	AudioPilot function is inope	No audio system illuminatic
Low vehicle battery voltage	X								
Jammed radio signals from after market equipment	X								
Speaker malfunction (e. g., foreign material penetration, damage)	X		X	X	X				
Improper speaker installation	X				X				
Poor connection of audio unit connector, terminal damage	X	X		X					X
Antenna malfunction (e.g., poor ground)	X								
Audio unit malfunction	X	X	X	X	X	X	X		X
Audio amplifier malfunction (with Bose)	X		X	X	X	X		X	
Open or short circuit in wiring harness between audio amplifier and ground (with Bose)	X								
Burnt fuse (B+)		X							
Burnt fuse (ACC)		X							
Open or short circuit in power supply (B+) wiring harness		X							
Open or short circuit in power supply (ACC) wiring harness		X							
Short circuit in wiring harness between audio unit and speaker (without Bose)			X	X					
Open circuit in wiring harness between audio unit and speaker (without Bose)				X					
Open or short circuit in wiring harness between audio amplifier and speaker (with Bose)			X	X					
Open or short circuit in wiring harness between audio amplifier and audio unit (with Bose)			X	X					
Poor connection of audio amplifier connector, terminal damage (with Bose)	X		X	X				X	
Short circuit inside speaker			X	X					
Door trim and/or package trim vibration					X				
Open or short circuit in vehicle speed signal wiring harness (e.g., instrument cluster)							X		
Burnt fuse (TNS signal)									X
Open or short circuit in TNS signal wiring harness									X
Center panel malfunction									X
Open or short circuit in Mic unit signal wiring harness								X	
Open or short circuit in Audiopilot signal wiring harness								X	

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CONFIRMATION STEP 1: AUDIO PANEL SWITCH CONFIRMATION [AUDIO]

- Verify the customer complaint and identify the malfunction as occurring from either the center panel or the audio unit.

How to activate audio panel switch confirmation mode

1. Turn the audio system on.
2. Press the POWER button and simultaneously pull up the CLOCK switch for **approx. 1 s.**
3. The audio panel switch confirmation mode is now activated.

STEP	INSPECTION	ACTION	
1	<ul style="list-style-type: none"><li>• Press each button on the center panel.</li><li>• Does the buzzer sound when a button is pressed?</li></ul>	Yes	Verify the customer complaint and then go to the appropriate symptom troubleshooting procedure.
		No	Go to the next step.
2	<ul style="list-style-type: none"><li>• Disassemble and reassemble the center panel and audio unit.</li><li>• Activate the audio panel switch confirmation mode.</li><li>• Does the buzzer sound when a button is pressed?</li></ul>	Yes	Go to the next step.
		No	Replace the center panel. (See <b>CENTER PANEL UNIT REMOVAL/INSTALLATION.</b> ) (See <b>CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</b> )
3	<ul style="list-style-type: none"><li>• Does the audio system operate properly?</li></ul>	Yes	The system is normal.
		No	Verify the customer complaint and then go to the appropriate symptom troubleshooting procedure.



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### CONFIRMATION STEP 2: AUDIO CONTROL SWITCH CONFIRMATION [AUDIO]

- Verify the customer complaint and identify the malfunction as occurring from either the audio control switch or the audio unit.

STEP	INSPECTION	ACTION	
1	<ul style="list-style-type: none"> <li>• Is the symptom related to either the audio control switch or the audio panel operation?</li> </ul>	Yes	Verify the customer complaint and then go to the appropriate symptom troubleshooting procedure.
		No	<p><b>The symptom is related to the audio panel operation:</b></p> <ul style="list-style-type: none"> <li>• Follow "Confirmation Step 1".</li> </ul> <p><b>The symptom is related to the audio control switch operation:</b></p> <ul style="list-style-type: none"> <li>• Go to the next step.</li> </ul>
2	<ul style="list-style-type: none"> <li>• Disconnect the audio unit connector (24-pin).</li> <li>• Inspect both the audio unit and the wiring harness-side connectors for a poor connection. (such as damaged/pulled-out pins, corrosion). <ul style="list-style-type: none"> <li>▪ Terminal N (ST SW1)</li> <li>▪ Terminal P (ST SW2)</li> </ul> </li> <li>• Are all the pins normal?</li> </ul>	Yes	Go to the next step.
		No	<p><b>If the audio unit side connector is malfunctioning:</b></p> <ul style="list-style-type: none"> <li>• Replace the audio unit.</li> </ul> <p>(See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a>)</p> <p>(See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a>)</p> <p>(See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY.</a>)</p> <p><b>If the wiring harness-side connector is malfunctioning:</b></p> <ul style="list-style-type: none"> <li>• Repair or replace the pins</li> </ul>

			and/or the connector.
3	<ul style="list-style-type: none"><li>• Inspect the continuity between audio unit wiring harness-side connector terminals N and P while operating the audio control switch.</li><li>• Does the resistance change?</li></ul>	Yes	Verify the customer complaint and then go to the appropriate symptom troubleshooting procedure.
		No	Go to the next step.
4	<ul style="list-style-type: none"><li>• Turn the ignition switch to the LOCK position.</li><li>• Remove the audio control switch.</li><li>• Inspect the continuity between the audio unit wiring harness-side connector (24-pin) terminal and the audio control switch wiring harness-side connector (8-pin) terminal.<ul style="list-style-type: none"><li>▪ Terminal N (24-pin) — Terminal G (8-pin)</li><li>▪ Terminal P (24-pin) — Terminal E (8-pin)</li></ul></li><li>• Is there continuity?</li></ul>	Yes	Replace the audio control switch.  (See <b>AUDIO CONTROL SWITCH REMOVAL/INSTALLATION.</b> )
		No	Repair or replace the related wiring harnesses.

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### NO.7 ALC FUNCTION IS INOPERATIVE [AUDIO]

7	ALC function is inoperative / Possible DTC: —
<p><b>Troubleshooting hints</b></p> <ul style="list-style-type: none"> <li>• Audio unit malfunction</li> <li>• Open or short circuit in vehicle speed signal wiring harness (e. g., instrument cluster)</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• Inspect the ALC function while driving the vehicle and playing a CD.</li> </ul>	

### Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<ul style="list-style-type: none"> <li>• Turn the ALC function on.</li> <li>• Inspect the ALC function operation while driving the vehicle. (ALC level 3)</li> <li>• Does the ALC system operate properly?.</li> </ul>	Yes	The system is normal. Explain the ALC function to the customer.
		No	Go to the next step.
2	<ul style="list-style-type: none"> <li>• Verify the connection of the audio unit connector (24-pin, vehicle speed signal).</li> <li>• Inspect both the audio unit and wiring harness-side connector terminal 1I for a poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Are all the pins normal?</li> </ul>	Yes	Repair or replace the pins and/or connector.
		No	Replace the audio unit. (See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a> )  (See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a> )  (See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY.</a> )



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FOREWORD [AUDIO]

NOTE:

- If the case location, time, and broadcasting station etc. can be specified through interview with the customer, there is the possibility that the signal reception environment is the cause of the problem.
- Perform confirmation of the symptom and evaluate under the conditions that the customer reported (location, time, broadcasting station etc.). If this is not possible, perform it under equivalent conditions.
- Before inspection or repair, record the broadcasting stations that customer has preset and reset them accordingly after the inspection or repair. Adjust the clock too.

Troubleshooting Index

No.	Symptom	Possible DTC
1	No radio reception (AM/FM)/No or low volume	09:Er20, 09:Er22
2	Noise from radio (AM only)	09:Er22
3	Noise from radio (FM only)	09:Er22
4	Cannot tune (SEEK does not stop)	09:Er20, 09:Er22
5	Cannot preset (preset function does not operate)	21:Er19
6	Reception frequency of radio slips	09:Er22

Quick Diagnostic Chart (Radio)

X: Applicable

Possible factor	Troubleshooting item					
	1	2	3	4	5	6
	No radio reception (AM/FM)/No or low volume	Noise from radio (AM only)	Noise from radio (FM only)	Cannot tune (SEEK does not stop)	Cannot preset (preset function does not operate)	Reception frequency of radio slips
Jamming from aftermarket electronic equipment (two-way radio, navigation system, mobile phone, etc)	X	X	X			
Audio unit	X	X	X	X	X	X
Antenna plug poor connection	X	X	X	X		
Antenna feeder	X	X	X	X		
Open or short circuit in wiring harness between audio unit and antenna (antenna amplifier power supply system)	X	X	X	X		
Electronic jamming from outside, or inferior condition of broadcasting station radio wave	X	X	X	X		X
Antenna rod is not installed (standard parts)	X	X	X	X		
Noise from electrical system on vehicle (e.g. fuel pump)		X	X			
Battery		X	X			
Charging system		X	X			
Antenna installation loosened		X	X			
Center panel				X	X	

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### CONFIRMATION STEP 1: RECEPTION CONDITION SYMPTOM (EXAMPLE) [AUDIO]

Symptom	Antenna signal condition	Source
Only a buzzing sound from the speakers	<ul style="list-style-type: none"><li>• There is no radio station broadcasting.</li><li>• Signals from the antenna to the audio unit are not transmitted.</li></ul>	<ul style="list-style-type: none"><li>• Electric noise caused by the operation of internal circuit from the audio unit itself</li><li>• Atmospheric noise</li></ul>
A buzzing or crunching sound and normal sound produced at the same time from the speakers	<ul style="list-style-type: none"><li>• Though signals are transmitted from the antenna to the audio unit, electrical noise from other sources is greater.</li></ul>	<ul style="list-style-type: none"><li>• Electrical noise caused by the operation of electrical components on the vehicle</li><li>• Electrical noise from high tension wires, transformer substation (factory), electrical feeder line (street car), or motorcycle.</li></ul>
A thumping sound and normal sound produced at the same time from the speakers (FM only)	<ul style="list-style-type: none"><li>• Noise occurs due to radio wave environment at specific places (e.g. in valleys between buildings). Noise varies when the vehicle itself or surrounding vehicles move. (FM only)</li></ul>	<ul style="list-style-type: none"><li>• Interference between direct and reflected waves of FM signals causes noise (Multipass noise).</li></ul>

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### CONFIRMATION STEP 2: ANTENNA SYSTEM SYMPTOM (EXAMPLE) [AUDIO]

Possible cause	AM reception condition	FM reception condition
<ul style="list-style-type: none"><li>• Antenna feeder axis, open circuit</li><li>• Antenna feeder plug not attached</li></ul>	NG: No reception	YES: Reception possible.  (Sensitivity decreases, but reception is possible under strong electric field.)
<ul style="list-style-type: none"><li>• Antenna feeder axis (+) to ground (-), open circuit</li></ul>	NG: No reception	NG: No reception
<ul style="list-style-type: none"><li>• Antenna feeder and antenna, poor ground</li></ul>	YES: Reception possible  (Noise may occur)	YES: Reception possible  (Sensitivity decreases, but reception is possible under strong electric field.)
<ul style="list-style-type: none"><li>• Antenna feeder, jack and plug poor connection</li></ul>	NG: No reception  (Depending on connection conditions)	YES: Reception possible  (Depending on connection conditions)



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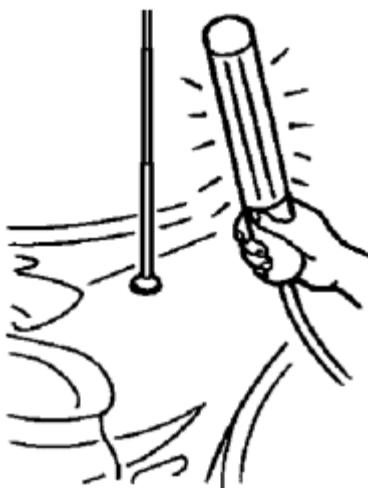
### CONFIRMATION STEP 3: ANTENNA SYSTEM SIMPLE INSPECTION [AUDIO]

#### NOTE:

- Because the antenna system is equipped with a capacitor, the continuity cannot be checked. Therefore proceed to the following simple inspection.
  - Turn the AM radio on.
  - Tune to the frequency with no radio broadcast and listen for a buzzing sound.
  - Turn a hand-held light on and shake it around the antenna rod (around 10—20 mm)
  - If a whirring sound from the speaker synchronized to the work light movement is confirmed, the antenna system is normal.

#### NOTE:

- Use a fluorescent light type for the inspection. Accurate diagnosis cannot be done with a different type of light.



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### NO.1 NO RADIO RECEPTION (AM/FM)/NO OR LOW VOLUME [AUDIO]

1	No radio reception (AM/FM) / no or low volume / Possible DTC: 09:Er20, 09:Er22
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Jamming from aftermarket electronic equipment (two-way radio, navigation system, mobile phone, etc.)</li> <li>• Audio unit malfunction</li> <li>• Poor connection of antenna feeder plug</li> <li>• Antenna feeder malfunction</li> <li>• Open or short circuit in wiring harness between audio unit and manual antenna (antenna amplifier power supply system)</li> <li>• Electronic jamming from outside, or inferior condition of broadcasting station radio wave</li> <li>• Antenna rod is not installed (standard parts)</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	• Turn the audio unit on.	Yes Go to Step 3.
	• Is the LCD indicated correctly?	No Go to the next step.
2	• Measure the voltage at B+ and ACC terminals.	Yes Go to the next step.
	• Is the voltage normal? <b>Specification</b> • <b>With ignition switch ON: 11.5 V or more</b> • <b>At idling: 12.5 V or more</b>	No Follow the diagnostic procedure for symptom No. 2 (Entire audio system).
3	• Set the volume between 10 and 15.	Yes Go to the next step.

	<ul style="list-style-type: none"> <li>Is a buzzing sound or voice confirmed?</li> </ul>	No	Follow the diagnostic procedure for symptom No. 3 (Entire audio system) or No. 4 (Entire audio system).
4	<ul style="list-style-type: none"> <li>Tune to a local broadcasting station and check the reception condition.</li> <li>Is the reception normal?</li> </ul>	Yes	Go to the next step.
		No	Go to Step 6.
5	<ul style="list-style-type: none"> <li>Push the PRESET buttons and check the preset conditions.</li> <li>Have preset stations been stored?</li> </ul>	Yes	The system is normal.
		No	Preset broadcasting stations.
6	<ul style="list-style-type: none"> <li>Is aftermarket electronic equipment (two-way radio, navigation system, mobile phone, etc.) installed?</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>A TV antenna located close to the audio antenna can be the cause of noise. Relocate the TV antenna.</li> </ul>	Yes	Go to the next step.
		No	Go to Step 8.
7	<ul style="list-style-type: none"> <li>Remove aftermarket electronic equipment.</li> <li>Turn the audio unit on and check the reception condition.</li> <li>Does reception improve?</li> </ul>	Yes	The system is normal.  (Explain to the customer that aftermarket electronic equipment is the cause of the noise)
		No	Go to the next step.
8	<ul style="list-style-type: none"> <li>Refer to confirmation Step 3, and inspect the antenna system.</li> <li>Is a whirring sound present?</li> </ul>	Yes	Replace the audio unit.  (See <b>CENTER PANEL UNIT REMOVAL/INSTALLATION.</b> )  (See <b>CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</b> )  (See <b>AUDIO UNIT DISASSEMBLY/ASSEMBLY.</b> )
		No	Go to the next step.
9	<ul style="list-style-type: none"> <li>Inspect the antenna feeder plug connection condition.</li> <li>Is the connection normal?</li> </ul>	Yes	Go to the next step.
		No	Insert the antenna feeder plug securely.
10	<ul style="list-style-type: none"> <li>Turn the ignition switch to the</li> </ul>	Yes	Replace the antenna feeder.

	<p>LOCK position.</p> <ul style="list-style-type: none"><li>• Measure the continuity between the antenna feeder axis and ground.</li><li>• Is there any continuity?</li></ul>		<p>(See <b>ANTENNA FEEDER LOCATION.</b>)</p>
		No	Go to the next step.
11	<ul style="list-style-type: none"><li>• Measure the voltage at audio unit terminal H (24-pin) to verify the antenna amplifier power supply.</li><li>• Is the voltage B+ ?</li></ul>	Yes	Go to the next step.
		No	<p>Replace the audio unit.</p> <p>(See <b>CENTER PANEL UNIT REMOVAL/INSTALLATION.</b>)</p> <p>(See <b>CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</b>)</p> <p>(See <b>AUDIO UNIT DISASSEMBLY/ASSEMBLY.</b>)</p>
12	<ul style="list-style-type: none"><li>• Turn the ignition switch to the LOCK position.</li><li>• Inspect the continuity between audio unit terminal H (24-pin) and manual antenna terminal A.</li><li>• Is there any continuity?</li></ul>	Yes	Go to the next step.
		No	<p>Repair or replace the wiring harness between the audio unit and the manual antenna (antenna amplifier power supply system), then verify the reception condition.</p> <p>If the reception has improved, troubleshooting is completed.</p> <p>If the reception has not improved, go to the next step.</p>
13	<ul style="list-style-type: none"><li>• Compare the reception with another audio unit on the same model (model/unit) under the same problem conditions.</li><li>• Is the reception equivalent to the customer's unit?</li></ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"><li>• Due to the following differences, you may sense a difference in reception efficiency.</li></ul> <p><b>(Vehicle factor)</b></p> <ul style="list-style-type: none"><li>▪ Antenna installation location, height, feeder wiring routing, optional</li></ul>	Yes	<p>The system is normal.</p> <p>(It is caused by electronic jamming from outside, or inferior broadcasting station signal condition.)</p>
		No	<p>Replace audio unit.</p> <p>(See <b>CENTER PANEL UNIT REMOVAL/INSTALLATION.</b>)</p> <p>(See <b>CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</b>)</p> <p>(See <b>AUDIO UNIT DISASSEMBLY/ASSEMBLY.</b>)</p>

electrical  
equipment

**(Audio unit  
factor)**

- High-tone  
setting:  
Decreases  
effective  
volume range  
when signals  
become weak.  
(Noise is easy  
to be  
conspicuous)
- Noise restraint  
setting:  
Widens  
effective  
volume range  
when signals  
become weak.  
(Noise is not  
conspicuous.)

## 2008 - MX-5 - Body and Accessories

### NO.2 NOISE FROM RADIO (AM ONLY) [AUDIO]

2	Noise from radio (am only) / Possible DTC: 09:Er22
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Antenna rod is not installed (standard part)</li> <li>• Jamming from aftermarket electronic equipment (two-way radio, navigation system, mobile phone, etc.)</li> <li>• Noise from electrical system on vehicle (e.g. fuel pump)</li> <li>• Battery malfunction</li> <li>• Charging system malfunction</li> <li>• Audio unit malfunction</li> <li>• Poor connection of antenna feeder plug</li> <li>• Antenna feeder malfunction</li> <li>• Open or short circuit in wiring harness between audio unit and manual antenna (antenna amplifier power supply system)</li> <li>• Electronic jamming from outside, or inferior condition of broadcasting station radio wave</li> <li>• Antenna installation loosened</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>• Tune to a local broadcasting station and check the reception condition.</li> <li>• Is the reception normal?</li> </ul>	Yes Tune to the correct frequency for the broadcasting station.  If not preset, preset it.
		No Go to the next step.
2	<ul style="list-style-type: none"> <li>• Inspect the antenna rod condition.</li> <li>• Is the antenna rod installed?</li> </ul>	Yes Go to the next step.
		No Advise the customer to install the antenna rod when the radio is used.

			(If the antenna rod is not a standard part, replace it.)
3	<ul style="list-style-type: none"> <li>Is aftermarket electronic equipment (two-way radio, navigation system, mobile phone, etc.) installed?</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>A TV antenna located close to the audio antenna can be the cause of noise. Relocate the TV antenna.</li> </ul>	Yes	Go to the next step.
		No	Go to Step 5.
4	<ul style="list-style-type: none"> <li>Remove aftermarket electronic equipment.</li> <li>Turn the audio unit on and check the reception condition.</li> <li>Does reception improve?</li> </ul>	Yes	The system is normal. (Explain to the customer that aftermarket electronic equipment is the cause of the noise)
		No	Go to the next step.
5	<ul style="list-style-type: none"> <li>Measure the battery voltage.</li> <li>Is battery voltage normal?</li> </ul> <p><b>Standard</b></p> <ul style="list-style-type: none"> <li><b>With ignition switch ON: 11.5 V or more</b></li> <li><b>At idling: 12.5 V or more</b></li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>Verify that the battery cables are connected to the terminals securely.</li> </ul>	Yes	Go to the next step.
		No	Charge the battery. Inspect the charging system, and repair or replace if necessary.
6	<ul style="list-style-type: none"> <li>Does the noise occur only when the vehicle electrical system (e.g. fuel pump) operates?</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>Identify the suspect electrical component by disconnecting fuses, turning switches on &amp; off, or disconnecting and connecting connectors.</li> <li>It is easier to use the simulation function on the M-MDS.</li> </ul>	Yes	Go to the next step.
		No	Go to Step 8.

7	<ul style="list-style-type: none"> <li>Verify the condition of the power supply and ground of the electric components, and the noise prevention capacitor.</li> <li>Is noise present after the inspection?</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>Inspect the following: <ul style="list-style-type: none"> <li>Power supply to electrical component for voltage drop (compare with battery voltage)</li> <li>Resistance between ground of electrical component and body. (Should be close to 0 ohm)</li> <li>Installation condition of noise prevention capacitor for fuel pump.</li> </ul> </li> </ul>	Yes	Go to the next step.
		No	Troubleshooting completed. <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>The audio unit supplies 12 V battery power to the antenna amplifier for AM radio reception in the radio mode. The audio unit cannot receive AM signals without the 12 V battery power to the antenna amplifier. If the AM signals strengthen, the audio unit may receive the signals with noise.</li> </ul>
8	<ul style="list-style-type: none"> <li>Inspect the antenna feeder plug connection condition.</li> <li>Is the connection normal?</li> </ul>	Yes	Go to the next step.
		No	Insert the antenna feeder plug securely.
9	<ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Measure the continuity between the antenna the feeder axis and ground.</li> <li>Is there any continuity?</li> </ul>	Yes	Replace antenna feeder. <p>(See <b>ANTENNA FEEDER LOCATION.</b>)</p>
		No	Go to the next step.
10	<ul style="list-style-type: none"> <li>Measure the voltage at audio unit terminal H (24-pin) to verify the antenna amplifier power supply .</li> </ul>	Yes	Go to the next step.
		No	Replace the audio unit.



	<ul style="list-style-type: none"><li>Is the voltage B+?</li></ul>		(See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a> )  (See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a> )  (See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY.</a> )
11	<ul style="list-style-type: none"><li>Turn the ignition switch to the LOCK position.</li><li>Inspect the continuity between audio unit terminal H (24-pin) and manual antenna terminal A.</li><li>Is there any continuity?</li></ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness between the audio unit and the manual antenna (antenna amplifier power supply system), then verify the reception condition.  If the reception has improved, troubleshooting is completed.  If the reception has not improved, go to the next step.
12	Compare the reception with another audio unit on same model (model/unit) under the same problem conditions.  <ul style="list-style-type: none"><li>Is the reception equivalent to the customer's unit?</li></ul> <b>NOTE:</b>  <ul style="list-style-type: none"><li>Due to the following differences, you may sense a difference in reception efficiency.  <div>(Vehicle factor)<ul style="list-style-type: none"><li>Antenna installation location, height, feeder wiring routing, optional electrical equipment</li></ul> <div>(Audio unit factor)<ul style="list-style-type: none"><li>High-tone setting: Decreases effective volume range when signals</li></ul></div></div></li></ul>	Yes	The system is normal (It is caused by electronic jamming from outside, or inferior broadcasting station signal condition).
		No	Go to the next step.

	<p>become weak. (Noise is easy to be conspicuous)</p> <ul style="list-style-type: none"> <li>▪ Noise restraint setting: Widens effective volume range when signals become weak. (Noise is not conspicuous.)</li> </ul>		
13	<ul style="list-style-type: none"> <li>• Retighten the ground for the antenna and antenna amplifier. Retighten the antenna rod.</li> <li>• Is the noise present after retightening?</li> </ul>	Yes	<p>Replace the audio unit.</p> <p>(See <b>CENTER PANEL UNIT REMOVAL/INSTALLATION.</b>)</p> <p>(See <b>CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</b>)</p> <p>(See <b>AUDIO UNIT DISASSEMBLY/ASSEMBLY.</b>)</p>
		No	Troubleshooting completed.

## 2008 - MX-5 - Body and Accessories

### NO.3 NOISE FROM RADIO (FM ONLY) [AUDIO]

3	Noise from radio (FM only) / Possible DTC: 09:Er22
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Antenna rod is not installed (standard part)</li> <li>• Jamming from aftermarket electronic equipment (two-way radio, navigation system, mobile phone, etc.)</li> <li>• Noise from electrical system on vehicle (e.g. fuel pump)</li> <li>• Battery malfunction</li> <li>• Charging system malfunction</li> <li>• Audio unit malfunction</li> <li>• Poor connection of antenna feeder plug</li> <li>• Antenna feeder malfunction</li> <li>• Open or short circuit in wiring harness between audio unit and manual antenna (antenna amplifier power supply system)</li> <li>• Electronic jamming from outside, or inferior condition of broadcasting station radio wave</li> <li>• Antenna installation loosened</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• FM broadcasts are known for good sound quality and resistance to noise, but FM broadcasts do carry characteristic noise. Though the audio unit is designed to reduce noise, there are times when noise occurs due to reception conditions.</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>• Tune to a local broadcasting station and check the reception condition.</li> <li>• Is the reception normal?</li> </ul>	Yes Tune to the correct frequency for the broadcasting station.  If not preset, preset it.
		No Go to the next step.

2	<ul style="list-style-type: none"> <li>Inspect the antenna rod condition.</li> <li>Is the antenna rod installed?</li> </ul>	Yes	Go to the next step.
		No	Advise the customer to install the antenna rod when the radio is used.  (If the antenna rod is not a standard part, replace it.)
3	<ul style="list-style-type: none"> <li>Is aftermarket electronic equipment (two-way radio, navigation system, mobile phone, etc.) installed?</li> </ul>	Yes	Go to the next step.
		No	Go to Step 5.
4	<ul style="list-style-type: none"> <li>Remove aftermarket electronic equipment.</li> <li>Turn the audio unit on and check the reception condition.</li> <li>Does the reception improve?</li> </ul>	Yes	The system is normal. (Explain to the customer that the aftermarket electronic equipment is the cause of the noise)
		No	Go to the next step.
5	<ul style="list-style-type: none"> <li>Measure the battery voltage.</li> <li>Is the battery voltage normal?</li> </ul> <p><b>Standard</b></p> <ul style="list-style-type: none"> <li><b>With ignition switch ON: 11.5 V or more</b></li> <li><b>At idling: 12.5 V or more</b></li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>Verify that the battery cables are connected to the terminals securely.</li> </ul>	Yes	Go to the next step.
		No	Charge the battery. Inspect the charging system, and repair or replace if necessary.
6	<ul style="list-style-type: none"> <li>Does the noise occur only when the vehicle's electrical system (e.g. fuel pump) operates?</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>Identify the suspect electrical component by disconnecting fuses, turning switches on &amp; off, or disconnecting and connecting connectors.</li> <li>It is easier to use the simulation function on the M-MDS.</li> </ul>	Yes	Go to the next step.
		No	Go to Step 8.
7	<ul style="list-style-type: none"> <li>Verify the condition of the power supply and ground of the</li> </ul>	Yes	Go to the next step.

	<p>electric components, and the noise prevention capacitor.</p> <ul style="list-style-type: none"><li>• Is the noise present after inspection?</li></ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"><li>• Inspect the following:<ul style="list-style-type: none"><li>▪ Power supply to electrical component for voltage drop (compare with battery voltage)</li><li>▪ Resistance between ground of electrical component and body. (Should be close to 0 ohm)</li><li>▪ Installation condition of noise prevention capacitor for fuel pump.</li></ul></li></ul>	No	Troubleshooting completed.
8	<ul style="list-style-type: none"><li>• Inspect the antenna feeder plug connection condition.</li><li>• Is the connection normal?</li></ul>	Yes	Go to the next step.
		No	Insert the antenna feeder plug securely.
9	<ul style="list-style-type: none"><li>• Turn the ignition switch to the LOCK position.</li><li>• Measure the continuity between the antenna feeder axis and ground.</li><li>• Is there any continuity?</li></ul>	Yes	Replace the antenna feeder. (See <b>ANTENNA FEEDER LOCATION.</b> )
		No	Go to the next step.
10	<ul style="list-style-type: none"><li>• Turn the ignition switch to the LOCK position.</li><li>• Inspect the continuity between audio unit terminal H (24-pin) and manual antenna terminal A.</li><li>• Is there any continuity?</li></ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness between the audio unit and the manual antenna (antenna amplifier power supply system), then verify the reception condition.  If the reception has improved, troubleshooting is completed.

			If the reception has not improved, go to the next step.
11	<ul style="list-style-type: none"> <li>Measure the voltage at audio unit terminal H (24-pin) to verify the antenna amplifier power supply.</li> <li>Is the voltage B+?</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>12 V is supplied from the audio unit to the antenna amplifier. (In radio mode)</li> <li>Even if the power supply voltage is not supplied, FM reception is possible, however, noise interference occurs more easily.</li> </ul>	Yes	Go to the next step.
		No	Replace the audio unit.  (See <b>CENTER PANEL UNIT REMOVAL/INSTALLATION.</b> )  (See <b>CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</b> )  (See <b>AUDIO UNIT DISASSEMBLY/ASSEMBLY.</b> )
12	<ul style="list-style-type: none"> <li>Compare the reception with another audio unit on the same model (model/unit) under the same problem conditions.</li> <li>Is the reception equivalent to the customer's unit?</li> </ul>	Yes	The system is normal (It is caused by electronic jamming from outside, or inferior broadcasting station signal condition).
		No	Go to the next step.
13	<ul style="list-style-type: none"> <li>Retighten the ground for the antenna installation part and antenna amplifier. Retighten the antenna rod.</li> <li>Is the noise present, after retightening?</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>When the antenna is not grounded properly, FM noise is likely to be noticed.</li> </ul>	Yes	Replace the audio unit.  (See <b>CENTER PANEL UNIT REMOVAL/INSTALLATION.</b> )  (See <b>CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</b> )  (See <b>AUDIO UNIT DISASSEMBLY/ASSEMBLY.</b> )
		No	Troubleshooting completed.

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### NO.4 CANNOT TUNE (SEEK DOES NOT STOP) [AUDIO]

4	Cannot tune (seek does not stop) / Possible DTC: 09:Er20, 09:Er22
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Center panel malfunction</li> <li>• Poor connection of antenna feeder plug</li> <li>• Antenna feeder malfunction</li> <li>• Audio unit malfunction</li> <li>• Electronic jamming from outside, or inferior condition of broadcasting station radio wave</li> <li>• Antenna rod is not installed</li> <li>• Open or short circuit in wiring harness between audio unit and manual antenna (antenna amplifier power supply system)</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>• Verify that the SEEK switch is normal when the switch is operated.</li> <li>• Is it normal?</li> </ul>	Yes Go to the next step.
		No Perform confirmation Step 1: audio panel switch confirmation. Replace the center panel if necessary.
2	<ul style="list-style-type: none"> <li>• Inspect the indication on the information display.</li> <li>• Does the frequency indication</li> </ul>	Yes Go to the next step.
		No Perform confirmation Step 1: audio panel switch confirmation. Replace the center panel if necessary.

	increase or decrease when the SEEK switch is operated?		
3	<ul style="list-style-type: none"><li>Manually tune to a local broadcasting station and check the reception condition.</li><li>Is the reception normal?</li></ul>	Yes	Go to Step 6.
		No	Go to the next step.
4	<ul style="list-style-type: none"><li>Inspect the antenna feeder plug connection condition.</li><li>Is the connection normal?</li></ul>	Yes	Go to the next step.
		No	Insert the antenna feeder plug securely.
5	<ul style="list-style-type: none"><li>Turn the ignition switch to the LOCK position.</li><li>Measure the continuity between the antenna feeder axis and ground.</li><li>Is there any continuity?</li></ul>	Yes	Replace antenna feeder. (See <b>ANTENNA FEEDER LOCATION.</b> )
		No	Go to the next step.
6	<ul style="list-style-type: none"><li>Turn the ignition switch to the LOCK position.</li><li>Inspect the continuity between audio unit terminal H</li></ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness between the audio unit and the manual antenna (antenna amplifier power supply system), then verify the reception condition.  If the reception has improved, troubleshooting is completed.  If the reception has not improved, go to the next step.



	<p>(24-pin) and manual antenna terminal A.</p> <ul style="list-style-type: none"> <li>Is there any continuity?</li> </ul>		
7	<ul style="list-style-type: none"> <li>Measure the voltage at audio unit terminal H (24-pin) to verify the antenna amplifier power supply .</li> <li>Is the voltage B+?</li> </ul>	Yes	Go to the next step.
		No	<p>Replace the audio unit.</p> <p>(See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a>)</p> <p>(See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a>)</p> <p>(See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY.</a>)</p>
8	<ul style="list-style-type: none"> <li>Check if the number of broadcasting stations changes depending on time and place.</li> <li>Does it change?</li> </ul>	Yes	<p>The system is normal. (Explain to customer that SEEK sometimes does not stop depending on the signal reception condition.)</p> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>Signals tend to reach longer distances at night. (It is conspicuous in AM signals, several audio functions may stop due to foreign broadcasting station or noise.) Though the audio system restrains sensitivity of SEEK and SCAN functions at night, the audio system may select broadcasting stations other than those desired when signals are considerably strong. This function is linked to the parking light. When the parking light or the headlights are turned on, SEEK and SCAN may not function for weak signals.</li> </ul>
		No	<p>Replace audio unit.</p> <p>(See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a>)</p> <p>(See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a>)</p> <p>(See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY.</a>)</p>

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### NO.5 CANNOT PRESET (PRESET FUNCTION DOES NOT OPERATE) [AUDIO]

5	Cannot preset (preset function does not operate)/Possible DTC: 21:Er19
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>• Audio unit malfunction</li> <li>• Center panel malfunction</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>• Tune to the desired station and press channel preset button 1 for <b>about 2 s</b> to store it.</li> <li>• Repeat the above for other stations using channel preset buttons 2 to 5.</li> <li>• Press channel preset button 1 to 6 one by one.</li> <li>• Are the stored stations present?</li> </ul>	Yes Go to the next step.
		No Go to Step 3.
2	<ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position, and then to ACC.</li> <li>• Check if the preset stations are stored by pressing the preset buttons.</li> <li>• Are the stations stored?</li> </ul>	Yes The system is normal. (Explain preset procedure to customer using Owner's Manual)
		No Replace the audio unit.  (See <b>CENTER PANEL UNIT REMOVAL/INSTALLATION.</b> )  (See <b>CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</b> )  (See <b>AUDIO UNIT DISASSEMBLY/ASSEMBLY.</b> )
3	<ul style="list-style-type: none"> <li>• Remove the center panel from the audio unit, and reinstall the center panel to the audio unit to check the connector connections.</li> <li>• Turn the audio power switch on.</li> </ul>	Yes Replace the audio unit.  (See <b>CENTER PANEL UNIT REMOVAL/INSTALLATION.</b> )  <b>CENTER PANEL UNIT</b>

	<ul style="list-style-type: none"><li>• Press the POWER button and simultaneously pull up the CLOCK switch at same time for <b>approximately 1 s</b> to enter the system to switch to the check mode.</li><li>• Press all buttons and check if a buzzing sound occur.</li><li>• Are all the buttons normal?</li></ul>	(See <a href="#">DISASSEMBLY/ASSEMBLY.</a> )
		(See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY.</a> )
		No Replace the center panel. (See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a> )  (See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a> )

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### NO.6 RECEPTION FREQUENCY OF RADIO SLIPS [AUDIO]

6	Reception frequency of radio slip/Possible DTC: 09:Er22
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Audio unit malfunction</li> <li>• Electronic jamming from outside, or inferior condition of broadcasting station radio wave</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION		ACTION
1	<ul style="list-style-type: none"> <li>• Operate the SEEK switch and check if the desired broadcasting station is tuned.</li> <li>• Is it normal?</li> </ul>	Yes	Go to Step 3.
		No	Go to the next step.
2	<ul style="list-style-type: none"> <li>• Check if another broadcasting station is received at a certain location when the indication of the reception frequency remains.</li> <li>• Are other station received?</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• While receiving a weak signal from one broadcasting station and approaching a broadcasting antenna which emits a strong signal, broadcasting from the strong signal is sometimes received.</li> </ul>	Yes	Go to the next step.
		No	Replace audio unit. (See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a> ) (See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a> ) (See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY.</a> )
3	<ul style="list-style-type: none"> <li>• Compare the reception with another audio unit on the same model (model/unit) under the same problem conditions.</li> <li>• Is the reception equivalent to the customer's unit?</li> </ul>	Yes	Troubleshooting completed (Audio unit is normal).
		No	Replace the audio unit. (See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a> ) (See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a> )

		(See <b>AUDIO UNIT DISASSEMBLY/ASSEMBLY.</b> )
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FOREWORD [AUDIO]

Troubleshooting Index

No.	Items	Symptom	Possible DTC
1	CD player/changer	CD player/changer does not load the CD or ejects the CD immediately	03:Er01, 03:Er10, 06:Er01, 06:Er10, 10:Er01, 10:Er10, 22:Er01, 22:Er10
2		CD player/changer does not eject the CD	03:Er01, 06:Er01, 10:Er01, 22:Er01
3		CD player/changer does not play the CD/No sound	03:Er07, 03:Er10, 06:Er07, 10:Er07, 22:Er07
4		Sound jumps	03:Er02, 06:Er02, 10:Er02, 22:Er02
5		Scratches on the CD	03:Er02, 06:Er02, 10:Er02, 22:Er02
6	CD changer	Disc changer is inoperative	06:Er01, 06:Er10, 22:Er01, 22:Er10
7	MP3 applicable	CD player does not play the MP3-formatted file	10:Er07, 22:Er07
8	CD player/changer	MP3-formatted file folder selection is inoperative/Track search is inoperative	10:Er02, 22:Er02
9		CD player does not indicate the MP3 title text	10:Er02, 22:Er02
10		CD player does not play the audio data (CDDA)	10:Er02, 22:Er02
11	CD player/changer	Track change is inoperative	03:Er02, 06:Er02, 10:Er02, 22:Er02

<div> <div>Troubleshooting Item</div> <div>Possible factor</div> </div>	CD player/changer					CD player	MP3 applicable CD player/changer				CD player/changer
	1	2	3	4	5	6	7	8	9	10	11
	CD player/changer does not load the CD or ejects the CD immediately	CD player/changer does not eject the CD	CD player/changer does not play the CD/No sound	Sound jumps	Scratches on the CD	Disc change is inoperative	CD player does not play the MP3-formatted file	MP3-formatted file folder selection is inoperative/Track search is inoperative	CD player does not indicate the MP3 title text	CD player does not play the audio data (CODA)	Track change is inoperative
CD is inserted upside down	X		X								
Audio unit is malfunctioning	X	X	X	X	X	X					X
Defective CD (egg., cracked, badly bent, rough edges, scratch, dirty CD, condensation)	X	X	X	X							X
Non-conventional discs (e.g., 8 cm (3 in) CD, 8 cm (3 in) disc adapter, heart-shaped disc, octagonal disc)	X	X	X								X
Poor connection of audio unit connector or terminal (e.g., damaged, bent, pull-out pin, corrosion)	X	X									
Improper center panel installation		X				X					
Improper CD cover installation		X									
Improper audio unit installation (e.g., rattle, loose)				X							
Inadequate tire pressure				X							
Deformed disc is used (e.g., out of specification (thickness), bent disc)	X	X			X						
Multiple CDs are inserted into the CD player at the same time		X			X						
Center panel is malfunctioning						X					X
CD-R/RW written format is out of specification							X			X	
MP3 and other format data are on the CD-R/RW							X				
File extension for MP3-formatted file is incorrect (Correct: ".mp3", Incorrect: e.g., RIFF)							X				
Defective CD-R/RW (e.g., dirty CD, scratch)							X	X	X	X	
Conflict of ID tag version for CD-R/RW								X	X		
Improper folder and/or music title in CD-R/RW								X			
The number of characters for the folder/music file name on the CD-R/RW exceeds the maximum number of characters								X	X		
Improper encode on CD-R/RW								X	X		
MP3 applicable CD player is malfunctioning							X	X	X	X	X
No title input in CD-R/RW									X		
Input title text using 2-byte characters									X		
Data other than audio data is in CD-R/RW										X	

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NO.3 CD PLAYER/CHANGER DOES NOT PLAY THE CD/NO SOUND [AUDIO]

3

CD player/changer does not play the CD/No sound  
Possible DTC:03:Er07, 03:Er10, 06:Er07, 10:E07, 22:Er07

Troubleshooting hints

- CD is inserted upside down
- Audio units is malfunctioning
- Defective CD (e.g., cracked, badly bent, rough edges, scratch, dirty CD, condensation)
- Non-conventional discs (e.g., 8 cm (3 in) CD, 8 cm (3 in) disc adapter, heart-shaped disc, octagonal disc)

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<div><ul style="list-style-type: none"><li>• Turn the radio on and check for sound.</li><li>• Is there sound output?</li></ul></div> <div>NOTE:</div> <div><ul style="list-style-type: none"><li>• Check the volume dial position.</li></ul></div>	Yes	Go to the next step.
		No	Go to symptom troubleshooting No.3 (Audio system).
2	<div><ul style="list-style-type: none"><li>• Was the CD inserted properly, label-side up?</li></ul></div>	Yes	Go to the next step.
		No	Explain to the customer that the CD should be inserted into the slot label-side up.
3	<div><ul style="list-style-type: none"><li>• Replace with a CD known to be operational.</li><li>• Does the CD player/changer load the CD?</li></ul></div>	Yes	Go to the next step.
		No	Replace the audio unit.  (See <b>CENTER PANEL UNIT REMOVAL/INSTALLATION.</b> )  (See <b>CENTER PANEL UNIT</b>



			<b>DISASSEMBLY/ASSEMBLY.)</b> <b>(See AUDIO UNIT DISASSEMBLY/ASSEMBLY.)</b>
4	<ul style="list-style-type: none"> <li>• Visually inspect the CD. <ul style="list-style-type: none"> <li>▪ Is there any dirt, scratches or deformation on the CD?</li> <li>▪ Is the CD a non-conventional disc?</li> <li>▪ Is there a CD with a MP3 recording?</li> </ul> </li> </ul>	Yes Explain to the customer that the defective CD or non-conventional disc cannot be use.	No Replace the audio unit. <b>(See CENTER PANEL UNIT REMOVAL/INSTALLATION.)</b> <b>(See CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.)</b> <b>(See AUDIO UNIT DISASSEMBLY/ASSEMBLY.)</b>

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NO.4 SOUND JUMPS [AUDIO]

4

Sound jumps  
Possible DTC:03:Er02, 06:Er02, 10:Er02, 22:Er02

Troubleshooting hints

- Audio unit is malfunctioning
- Defective CD (e.g., cracked, badly bent, rough edges, scratch, dirty CD, condensation)
- Improper audio unit installation (e.g., rattle, loose)
- Inadequate tire pressure

NOTE:

- The CD may be malfunctioning if the sound jumps on a certain CD only. Inspect the CD player/changer operation using a CD known to be operational.

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<ul style="list-style-type: none"><li>• Does the sound jump when the vehicle is stopped?</li></ul>	Yes	Go to the Step 6.
		No	Go to the next step.
2	<ul style="list-style-type: none"><li>• Drive the vehicle.</li><li>• Does the sound jump when driving over uneven surfaces?</li></ul>	Yes	Go to the next step.
		No	Go to the Step 6.
3	<ul style="list-style-type: none"><li>• Is the audio unit installed securely?</li></ul>	Yes	Go to the next step.
		No	Install the audio unit securely.
4	<ul style="list-style-type: none"><li>• Inspect the tire pressure.</li><li>• Is the tire pressure normal?</li></ul>	Yes	Replace the audio unit.
			(See <b>CENTER PANEL UNIT REMOVAL/INSTALLATION.</b> )

			(See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY</a> .) (See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY</a> .)
		No	Go to the next step.
5	<ul style="list-style-type: none"> <li>Adjust the tire pressure within specification.</li> <li>Does the sound jump when driving the vehicle?</li> </ul>	Yes	Replace the audio unit.  (See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION</a> .)  (See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY</a> .)  (See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY</a> .)
		No	Audio system is normal. Explain repairs to the customers.
6	<ul style="list-style-type: none"> <li>Replace with a CD other than the one known to be operational.</li> <li>Does the sound jump when driving the vehicle?</li> </ul>	Yes	Replace the audio unit.  (See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION</a> .)  (See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY</a> .)  (See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY</a> .)
		No	Audio system is normal. Explain to the customer that the CD is malfunctioning.

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### NO.6 DISC CHANGE IS INOPERATIVE [AUDIO]

<div>Disc change is inoperative</div> <div>6</div> <div>Possible DTC:06:Er01, 06:Er10, 22:Er01, 22:Er10</div>	<div><b>Troubleshooting hints</b></div> <ul style="list-style-type: none"> <li>• Audio unit is malfunctioning</li> <li>• Improper center panel installation</li> <li>• Center panel is malfunctioning</li> </ul>
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#### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>• Inspect the CD changer operation.</li> <li>• Does the CD changer operate properly?</li> </ul>	Yes Go to the next step.
		No Go to symptom troubleshooting "No.3 CD player/changer does not play the CD/No sound".
2	<ul style="list-style-type: none"> <li>• Inspect the following: <ul style="list-style-type: none"> <li>▪ Is the display shown properly when operating the disc change button?</li> <li>▪ Does the radio band selection operate properly?</li> </ul> </li> </ul>	Yes Replace the audio unit.  (See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a> )  (See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a> )  (See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY.</a> )
		No Go to the next step.
3	<ul style="list-style-type: none"> <li>• Inspect the center panel installation.</li> <li>• Does the CD changer change the disc properly after re-installing the center panel?</li> </ul>	Yes Install the center panel securely and properly.
		No Go to "No.1 Audio panel switch inspection" in this section. Replace the center panel if necessary.

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NO.7 CD PLAYER DOES NOT PLAY THE MP3-FORMATTED FILE [AUDIO]

7

CD player does not play the MP3-formatted file  
Possible DTC10:Er07, 22:Er07

Troubleshooting hints

- CD-R/RW write format is out of specification
- MP3 or other format data are recorded the CD-R/RW
- File extension for MP3-formatted file is incorrect (Correct. ".mp3", incorrect: e.g., RIFF)
- Defective CD-R/RW (e.g. dirty CD, scratch)
- MP3 applicable CD player is malfunctioning

NOTE:

- Free-software for MP3-formatting available on the market may cause deterioration of sound quality, or cause noise and defective play, which could result in the CD player not playing the customer-made MP3-formatted files.
- The CD player may not play the CD-R/RW properly due to the disc condition.
- If there are MP3-formatted files and other files on the same disc, the CD player may not play the disc.
- If there are MP3-formatted files and audio data on the same disc, the CD player loads and plays the first session of the data only.

Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"><li>• Inspect the written format of the recorded data on the CD-R/RW.</li><li>• Is the write format correct?</li></ul>	YesGo to the next step.
		No Write the CD-R/RW to the correct specification.
2	<ul style="list-style-type: none"><li>• Inspect the</li></ul>	YesReplace with an operational CD-R/RW (MP3-formatted file

	<p>recorded data on the CD-R/RW.</p> <ul style="list-style-type: none"><li>• Are there MP3 or other format data on the CD-R/RW.</li></ul>	<p>data only), then inspect the CD player operation.</p> <p><b>If the CD player plays the MP3-formatted file:</b></p> <ul style="list-style-type: none"><li>• Audio system is normal. Explain to the customer that the CD player does not operate properly if MP3 or other format data are recorded the CD-R/RW.</li></ul> <p><b>If the CD player does not play the MP3-formatted file:</b></p> <ul style="list-style-type: none"><li>• Replace the audio unit.</li></ul> <p>(See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a>)</p> <p>(See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a>)</p> <p>(See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY.</a>)</p>
		No Go to the next step.
3	<ul style="list-style-type: none"><li>• Inspect the CD-R/RW write format.</li><li>• Is the write format within the specification (".mp3" is the correct file extension)?</li></ul>	<p>Yes Replace with a CD-R/RW disc using the ".mp3" file extension, then inspect the CD player operation.</p> <p><b>If the CD player plays the MP3-formatted file:</b></p> <ul style="list-style-type: none"><li>• Audio system is normal. Explain to the customer that the CD player does not operate properly if the correct file extension is not used.</li></ul> <p><b>If the CD player does not play the MP3-formatted file:</b></p> <ul style="list-style-type: none"><li>• Replace the audio unit.</li></ul> <p>(See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a>)</p> <p>(See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a>)</p> <p>(See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY.</a>)</p>
		No Go to the next step.
4	<ul style="list-style-type: none"><li>• Visually inspect the CD-R/RW.</li><li>• Is there any dirt or scratches on the CD-R/RW?</li></ul>	<p>Yes Clean the disc or replace it with an operational CD-R/RW.</p> <p>No Replace the audio unit.</p> <p>(See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a>)</p> <p>(See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a>)</p>

		(See <b>AUDIO UNIT DISASSEMBLY/ASSEMBLY.</b> )
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NO.8 MP3-FORMATTED FILE FOLDER SELECTION IS INOPERATIVE/TRACK SEARCH IS INOPERATIVE [AUDIO]

8

MP3-formatted file folder selection is inoperative/Track search is inoperative  
Possible DTC: 10:Er02, 22:Er02

Troubleshooting hints

- Defective CD-R/RW (e.g. dirty CD, scratch)
- Conflict of ID tag version for CD-R/RW
- Improper folder and/or music title in CD-R/RW
- The number of characters for the folder/audio file name on the CD-R/RW exceeds the maximum number of characters
- Improper encode on CD-R/RW
- MP3 applicable CD player is malfunctioning

- NOTE:
- ID3 is a tagging format for MP3-formatted files. ID3 allows metadata (e.g., title, artist, track number) to be added to the MP3-formatted file.
  - There are two versions in the ID tag.
    - ID3v1: This is the most widespread standard tag format and most software is compatible with this version. There is a limitation on the maximum number of characters for the text data.
    - ID3v2: There are a variety of versions in V2, but there is no interchangeability among the versions.

Limitation on the maximum number of characters for the text data (ID3v1)

Item	Maximum number of characters	Description
Title	30	Music title
Artist	30	Artist name

Album	30	Album title
Year	4	Album produced year/CD wholesale year
Genre	—	Music category selection
Comment	30	Free comment
Track	3	Track number

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>Visually inspect the CD-R/RW.</li> <li>Is there any dirt or scratches on the CD-R/RW?</li> </ul>	Yes Clean the disc or replace it with an operational CD-R/RW.
		No Go to the next step.
2	<ul style="list-style-type: none"> <li>Inspect the ID tag version.</li> <li>Is the ID tag correct?</li> </ul>	Yes Go to the next step.
		No Write the CD-R/RW to the correct ID tag version.
3	<ul style="list-style-type: none"> <li>Inspect the folder and audio file names.</li> <li>Are all the file names input correctly?</li> </ul>	Yes Go to the next step.
		No Use a CD-R/RW with folder and audio file names that are input correctly.
4	<ul style="list-style-type: none"> <li>Inspect the folder and audio file names on the CD-R/RW.</li> <li>Is the encode correct?</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>Unreadable characters may be displayed if the incorrect encode is used.</li> </ul>	Yes Go to the next step.
		No Use the correct encode.
5	<ul style="list-style-type: none"> <li>Inspect the number of characters for the folder and audio file names.</li> <li>Is the number of characters within the maximum number of characters?</li> </ul>	Yes Replace the audio unit. (See <b>CENTER PANEL UNIT REMOVAL/INSTALLATION.</b> ) (See <b>CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</b> ) (See <b>AUDIO UNIT DISASSEMBLY/ASSEMBLY.</b> )

	No Input the folder and audio file names within the maximum number of characters.
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### NO.9 CD PLAYER DOES NOT INDICATE THE MP3 TITLE TEXT [AUDIO]

9	<p>CD player does not indicate the MP3 title text</p> <p>Possible DTC: 10:Er02, 22:Er02</p>
<p><b>Troubleshooting hints</b></p> <ul style="list-style-type: none"> <li>• Defective CD-R/RW (e.g. dirty CD, scratch)</li> <li>• Conflict of ID tag version for CD-R/RW</li> <li>• The number of characters for the folder/audio file name on the CD-R/RW exceeds the maximum number of characters</li> <li>• Improper encode in CD-R/RW</li> <li>• MP3 applicable CD player is malfunctioning</li> <li>• No title input in CD-R/RW</li> <li>• Input title text using 2-byte characters</li> </ul>	

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>• Visually inspect the CD-R/RW.</li> <li>• Is there any dirt or scratch on the CD/R/RW?</li> </ul>	Yes Clean the disc or replace it with an operational CD-R/RW.
		No Go to the next step.
2	<ul style="list-style-type: none"> <li>• Inspect the LCD.</li> <li>• Is the CD (other than MP3 compatible) displayed on the LCD?</li> </ul>	Yes Go to the next step.
		No Go to the symptom troubleshooting No.9 (Entire audio system).
3	<ul style="list-style-type: none"> <li>• Inspect the ID tag version.</li> <li>• Is the ID tag correct?</li> </ul>	Yes Go to the next step.
		No Write the CD-R/RW to the correct ID tag version.

4	<ul style="list-style-type: none"> <li>Is the title text input into the CD-R/RW?</li> </ul>	Yes	Go to the next step.
		No	Input the title text.  <b>NOTE:</b> <ul style="list-style-type: none"> <li>Do not input the title text using two-byte characters.</li> </ul>
5	<ul style="list-style-type: none"> <li>Inspect the folder and audio file names on the CD-R/RW.</li> <li>Is the encode correct?</li> </ul>	Yes	Go to the next step.
		No	Use the correct encode.
6	<ul style="list-style-type: none"> <li>Inspect the number of characters for the folder and audio file name.</li> <li>Is the number of characters within the maximum number of characters?</li> </ul>	Yes	Replace the audio unit.  (See <b>CENTER PANEL UNIT REMOVAL/INSTALLATION.</b> )  (See <b>CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</b> )  (See <b>AUDIO UNIT DISASSEMBLY/ASSEMBLY.</b> )
		No	Input the folder and audio file names within the maximum number of characters.

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### NO.10 CD PLAYER DOES NOT PLAY THE AUDIO DATA (CDDA) [AUDIO]

10	<p>CD player does not play the audio data (CDDA)</p> <p>Possible DTC: 10:Er02, 22:Er02</p>
<p><b>Troubleshooting hints</b></p> <ul style="list-style-type: none"> <li>• CD-R/RW write format is out of specification</li> <li>• Defective CD-R/RW (e.g., dirty CD, scratch)</li> <li>• MP3 applicable CD player is malfunctioning</li> <li>• Data other than audio data is in CD-R/RW</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• The CD player may not play the CD-R/RW properly due to the disc condition.</li> <li>• If there are MP3-formatted files and audio data on the same disc, the CD player loads and plays the first session of the data only.</li> </ul>	

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>• Replace with an audio-CD known to be operational.</li> <li>• Does the CD player play the audio-CD properly?</li> </ul>	Yes Go to the next step.
		No Replace the audio unit. (See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a> ) (See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a> ) (See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY.</a> )
2	<ul style="list-style-type: none"> <li>• Inspect the write format of the recorded data on the CD-R/RW.</li> <li>• Is the write format correct?</li> </ul>	Yes Go to the next step.
		No Write the CD-R/RW to the correct specification.

3	<ul style="list-style-type: none"> <li>Inspect the recorded data in the CD-R/RW.</li> <li>Is any data other than the audio data recorded on the CD-R/RW?</li> </ul>	Yes	<p>Replace with a CD-R/RW known to be operational (record audio data only), then inspect the CD player operation.</p> <p><b>If the CD-R/RW plays:</b></p> <ul style="list-style-type: none"> <li>Audio system is normal. Explain to the customer that the CD player does not operate properly if audio data or other data are recorded on the CD-R/RW.</li> </ul> <p><b>If the CD-R/RW does not play:</b></p> <ul style="list-style-type: none"> <li>Replace the audio unit.</li> </ul> <p>(See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a>)</p> <p>(See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a>)</p> <p>(See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY.</a>)</p>
		No	Go to the next step.
4	<ul style="list-style-type: none"> <li>Visually inspect the CD-R/RW.</li> <li>Is there any dirt or scratches on the CD-R/RW?</li> </ul>	Yes	Clean the disc or replace it with an operational CD-R/RW.
		No	<p>Replace the audio unit.</p> <p>(See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a>)</p> <p>(See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a>)</p> <p>(See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY.</a>)</p>

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NO.11 TRACK CHANGE IS INOPERATIVE [AUDIO]

11	Track change is inoperative Possible DTC:03:Er02, 06:Er02, 10:Er02, 22:Er02
<div><div>Troubleshooting hints</div><div><ul style="list-style-type: none"><li>Audio unit is malfunctioning</li><li>Defective CD (e.g., cracked, badly bent, rough edges, scratch, dirty CD, condensation)</li><li>Non-conventional discs (e.g., 8 cm (3 in) CD, 8 cm (3 in) disc adapter, heart-shaped disc, octagonal disc)</li><li>Center panel is malfunctioning</li><li>MP3 applicable CD player is malfunctioning</li></ul></div></div>	

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<ul style="list-style-type: none"><li>Replace with a CD known to be operational.</li><li>Does the CD player change the track?</li></ul>	Yes	Explain to the customer that the defective CD or a non-conventional disc cannot be used.
		No	Go to the next step.
2	<ul style="list-style-type: none"><li>Inspect the center panel installation.</li><li>Does the CD player change the track number on the display when pressing the track up or down button?</li></ul>	Yes	Replace the audio unit.  (See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a> )  (See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a> )  (See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY.</a> )
		No	Go to the “No.1 Audio panel switch inspection” in this section. Replace the center panel if necessary.



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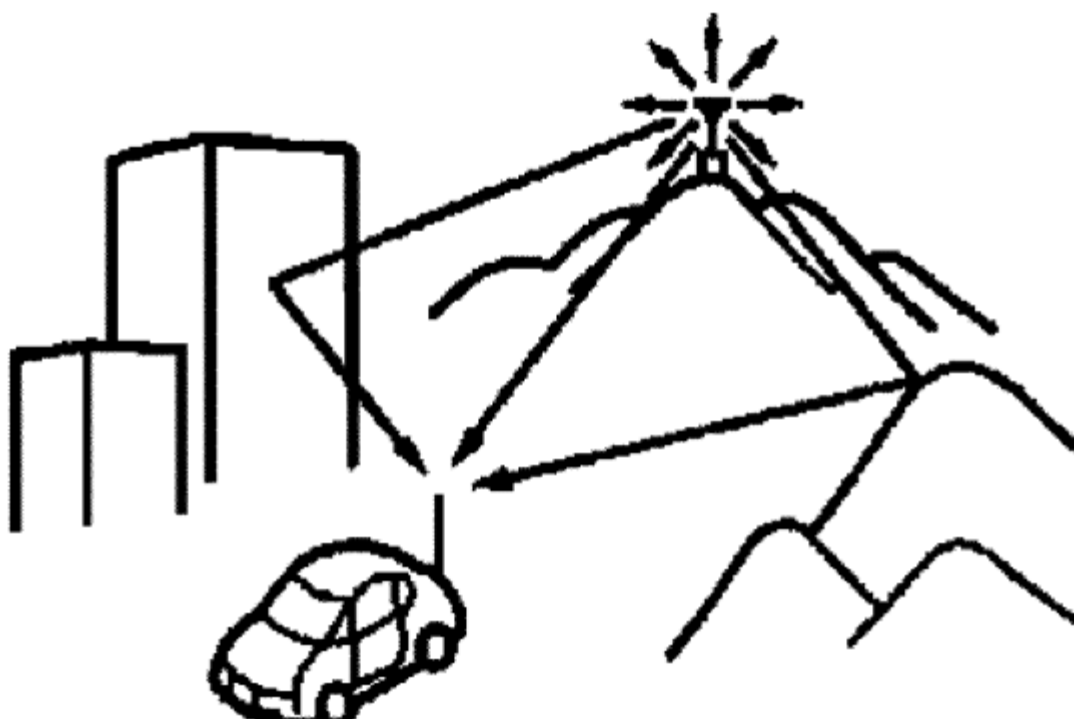
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### RADIO [AUDIO]

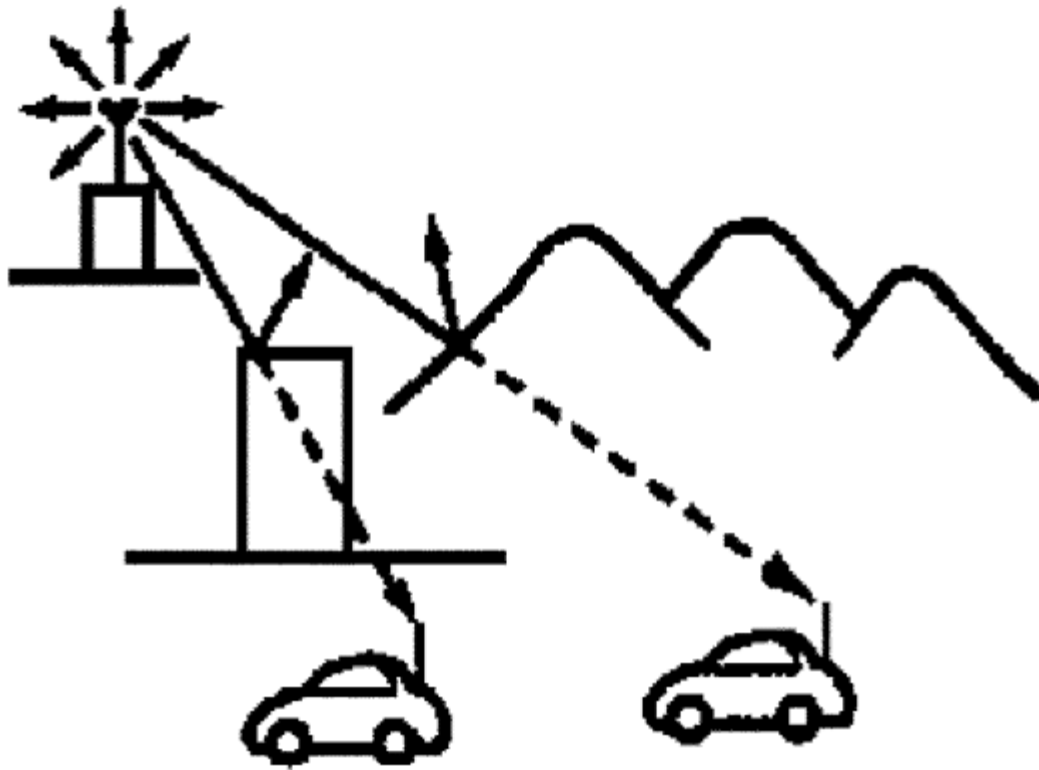
#### 1. Multipath Noise

- Signals from an FM transmitter are high frequency and similar to beams of light because they do not bend around corners, but they do reflect. Since FM signals can be reflected by obstructions, it is possible to receive both the direct signal and the reflected signal at the same time. This causes a slight delay in reception and may be heard as a broken sound or a distortion.



#### 2. Flutter/Skip Noise

- Signals become weak in valleys between mountains, tall buildings, and other obstacles. When the vehicle passes through such an area, the reception conditions may change suddenly, resulting in annoying noise.



### 3. Stereo and Monaural Receptions

- As signals become weak, noise may appear more in stereo reception. Compared to stereo reception, noise in monaural reception is relatively less apparent.

### Audio Reception Improvement Measures

#### Separation control

- Utilizing the characteristic of monaural reception that noise is relatively less apparent than stereo reception, the audio system automatically changes the reception from stereo to monaural and lessens annoying noise when signals become weak or a multipath phenomenon occurs.

#### High tone control

- When signals become weak or a multipath phenomenon occurs, the audio system restrains the volume level in the high frequency band and lessens the annoying noise.

### Effect Setting for Separation Control and High Tone Control

- The separation and high tone controls influence sound quality, Therefore they are specifically tuned to the individual model. (Comparison of characteristic must be done on

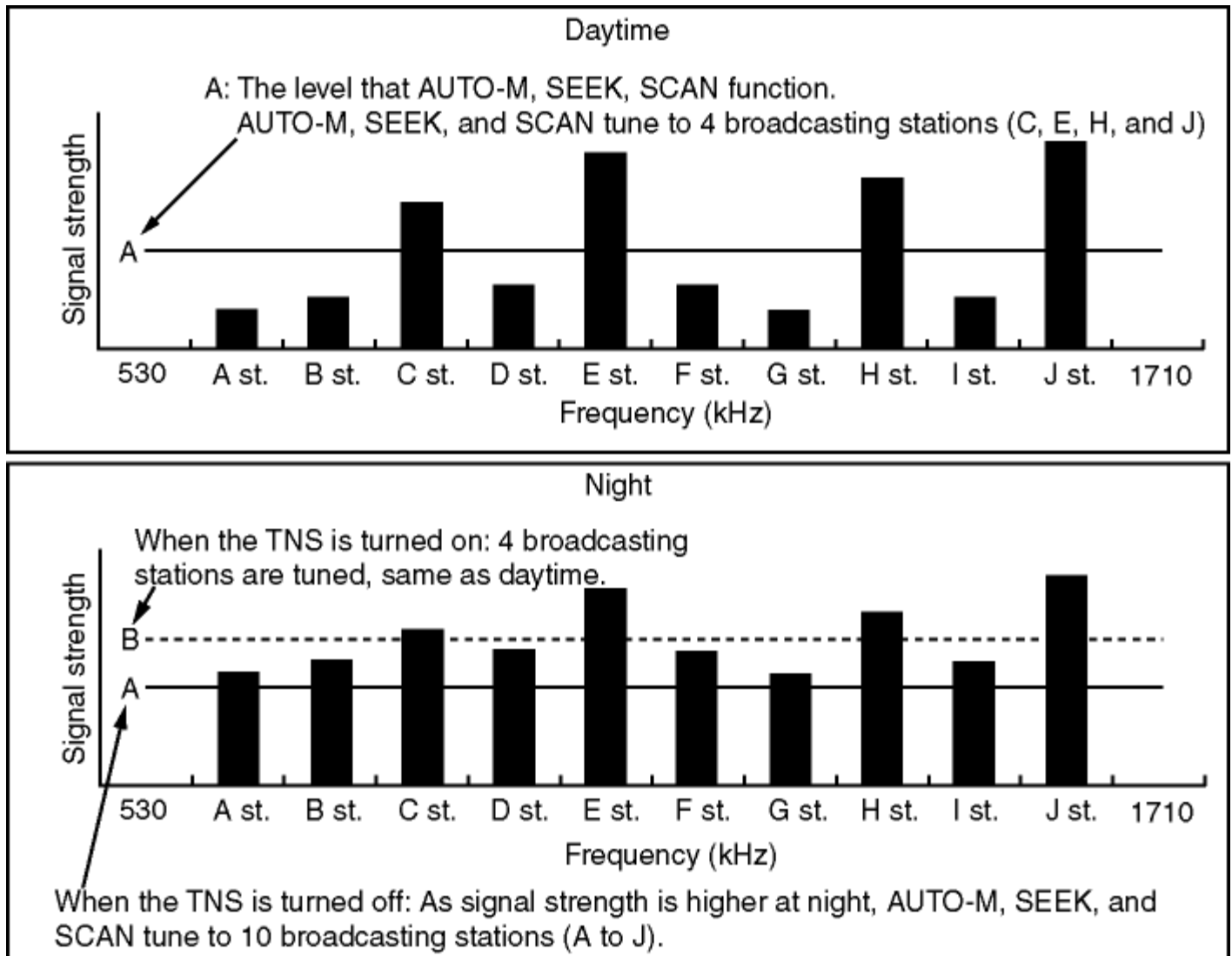
the same models)

High tone setting      ➡    Less effective range      ➡    Noise is conspicuous

Noise restraint setting   ➡    Wider effective range   ➡    Noise is less conspicuous

#### Remarks

- Signals tend to reach longer distances at night. This is particularly true for AM signals where foreign broadcasts or noise may cause inadvertent operation. Though the audio system restrains the sensitivity of the SEEK and SCAN functions at night, the audio system may select other than desired broadcasting stations other than those desired when signals are considerably strong. This function is linked to the parking light. When the parking light or the headlights are turned on, SEEK and SCAN may not function for weak signals.

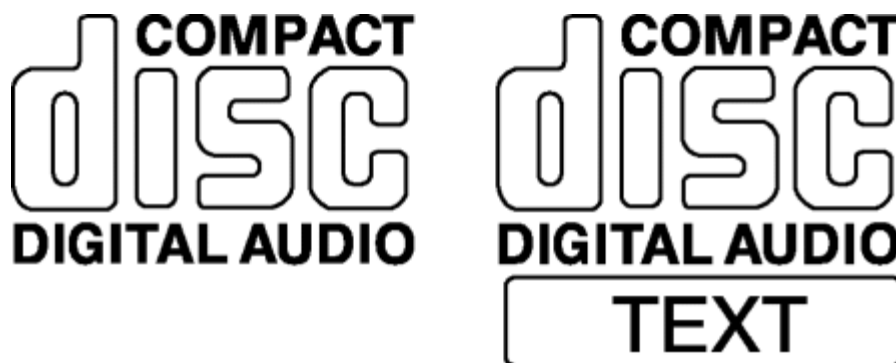




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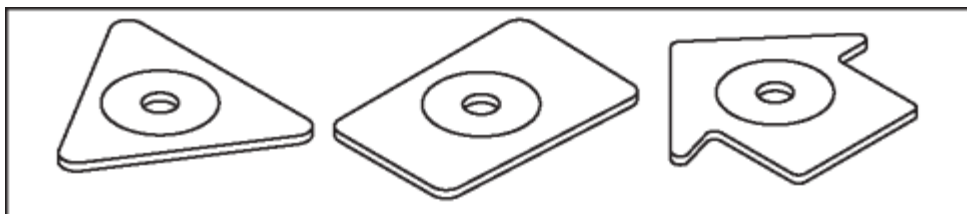
### AUDIO CD [AUDIO]

- The CD player/changer has been designed to play CDs bearing the identification logo, COMPACT DISC DIGITAL AUDIO, as shown. No other discs can be played on the CD player/changer other than MP3 applicable ones.



- The CD player/changer may not play the following types of CDs:
  - Defective CDs (e.g., cracked, badly bent, rough edges, scratch, dirty CD condensation)
  - 8 cm (3 in) CD accessories (e.g., 8 cm (3 in) disc adapter, sticker, label)
  - Nonstandard CDs (e.g., Diameter/thickness is out of specification)
    - Specification: 119.7—120.3 mm (4.668—4.692 in) of diameter, 12+0.3 or -0.1 mm (0.047+0.012 or 0.004 in) of thickness
- Do not use non-conventional discs. The CD player/changer could be damaged.

Examples:



- Although the same physical size as the compact disc, SACDs use a different kind of digital audio signal called Direct Stream Digital.
- The CD player/changer may not play the CD-R/RW properly due to the disc condition (excluding MP3).

### MP3-Formatted File

## Outline of CD-R and CD-RW

- Definition
  - CD-R: The CD-R is a non-rewritable version. Once a section of a CD-R is written, it cannot be erased or rewritten.
  - CD-RW: The CD-RW is a re-writable version of CD-ROM and the data can be written an unlimited number of times.
  - Since the reflected laser beam amount of a CD-R/RW is less than the reflected laser beam amount of the conventional CD media, the CD player/changer may not play the CD-R/RW or the sound may jump.
  - Since the recording quality of the CD-R/RWs vary widely, some CD-R/RWs may not play.

### Recording method

- There are two methods for recording.
- Classification by recorder
  - Record the audio data in the audio-CD by audio recorder
    - The price of the audio recorder and original audio-CD include the copyright fee.
  - Record the audio data to a conventional data-CD using a personal computer
    - The data-CD is cheaper than the audio-CD. But, there are lower quality CDs.
- Classification by audio data extraction/compression
  - Extracted audio data
    - The CD-R/RW player can play the extracted audio data.
  - Compressed audio data
    - It is possible to record a large quantity of music to a disc. The sound quality varies depending on the audio data compression format. The compressed audio data can be played on the applicable player only.
  - Types of compression format:
    - MP3: MPEG Audio Layer 3 — Mazda genuine MP3 applicable CD player is available.
    - WMA: Windows Media Audio
    - ATRAG: Adaptive TRansform Acoustic Coding

### MP3

- The following conditions should be met in order to record the MP3-formatted data to the MP3 applicable CD player:

Media	Applicable to the CD-R/RW
Logical format	ISO 9660 level 1&2 / Joliet / Romeo
Directory hierarchy	To 8 levels
Number of files	Maximum 255 as the total number of files and folders Maximum of 155 for folders
ID3 TAG	Applicable to Ver1.1, 2.3 and 2.4
File extension	MP3
Packet writing	Not applicable
Bit rate	8kbps—320kbps/VBR
Sampling rate	11.025kHz—48kHz

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### NO.1 AF NOISE OR POP NOISE AT ALL SOURCES (RADIO, CD) [AUDIO]

1 AF noise or POP noise at all sources (Radio, CD) / Possible DTC: 09:Er20, 09:Er21

#### Troubleshooting hints

- Low vehicle battery voltage.
- Jammed radio signals from after market equipment.
- Speaker malfunction (e.g., foreign material penetration, damage)
- Improper speaker installation
- Audio unit malfunction
- Audio amplifier malfunction (with Bose)
- Poor connection of audio unit connector, terminal damage
- Poor connection of audio amplifier connector, terminal damage
- Antenna malfunction (e.g., poor ground)
- Open or short circuit in wiring harness between audio amplifier and ground (with Bose)

#### NOTE:

- AF noise is a snapping noise that generally occurs during ON/OFF switching operations of electrical equipment other than the audio unit, or a continual rasping noise that occurs when electrical equipment is operated. This is caused by noise interference in the power supply wiring, signal wiring, speaker cable or head of cassette deck. Therefore noise can be heard regardless of radio wave conditions or the audio volume position. The noise will start after one click from the minimum position of the volume button but normally does not change even when volume is turned to a higher position.
- POP noise is snapping or popping noise that occurs during ON/OFF switching operation of the audio unit, or when switching from radio to CD. Even a normal audio unit sometimes emits a little noise depending on the conditions.

#### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"><li>• Inspect the vehicle battery voltage.</li></ul>	YesGo to the next step.

	<p>Is the vehicle battery voltage normal?</p> <p><b>Specification:</b></p> <ul style="list-style-type: none"><li>• <b>Ignition switch ON: 11.5 V or more</b></li><li>• <b>Idle: 12.5 V or more</b></li></ul>	No	Charge the battery, then go to the next step.
2	<ul style="list-style-type: none"><li>• Turn the audio system on.</li><li>• Is there any noise?</li></ul>	Yes	Go to the next step.
		No	The system is normal. Explain to the customer that the vehicle battery voltage was low.
3	<ul style="list-style-type: none"><li>• Are any of the following after-market equipment installed? (Inspect especially near the antenna.)<ul style="list-style-type: none"><li>▪ Radar detector</li><li>▪ Remote engine starter</li><li>▪ Anti-theft device</li><li>▪ Other</li></ul></li></ul>	Yes	Go to the next step.
		No	Go to the Step 5.
4	<ul style="list-style-type: none"><li>• Remove the after-market equipment.</li><li>• Turn the audio system on.</li><li>• Is there any noise?</li></ul>	Yes	Go to the next step.
		No	The system is normal. The after-market electrical devices might be the cause of the noise.
5	<ul style="list-style-type: none"><li>• Is there noise coming from all the speakers?</li></ul>	Yes	Go to the Step 7.
		No	Go to the next step.
6	<ul style="list-style-type: none"><li>• Inspect the suspect speaker.</li><li>• Is the speaker normal?</li></ul>	Yes	Go to the next step.
		No	<p><b>If there is any foreign material adhering to the speaker:</b></p> <ul style="list-style-type: none"><li>• Remove the foreign material from the speaker.</li></ul> <p><b>If the speaker is malfunctioning:</b></p> <ul style="list-style-type: none"><li>• Replace the speaker.</li></ul> <p>(See <b>DOOR SPEAKER</b></p>

			<b>REMOVAL/INSTALLATION.)</b>  (See <b>REAR SPEAKER REMOVAL/INSTALLATION.)</b>  (See <b>CENTER SPEAKER REMOVAL/INSTALLATION.)</b>  <b>If the speaker is not installed properly:</b> <ul style="list-style-type: none"> <li>• Install the speaker properly.</li> </ul>
7	<ul style="list-style-type: none"> <li>• Attempt to duplicate the symptom on another vehicle.</li> <li>• Does the noise level improve compared to the customer's vehicle?</li> </ul>	Yes	Go to the next step.
		No	The system is normal. Explain the noise generation mechanism to the customer.  <b>NOTE:</b> <ul style="list-style-type: none"> <li>• The noise level that may be heard varies depending on the operating speed of the audio power and/or mode switches.</li> </ul>
8	<ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Remove the audio unit (without Bose) or the audio amplifier (with Bose).</li> <li>• Inspect the connection of the audio unit connector (without Bose, 24-pin) or the audio amplifier connector (with Bose, 8-pin) (for sound signal line).</li> <li>• Is the connector connected securely?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the terminal or connector. Go to the next step.
9	<ul style="list-style-type: none"> <li>• Is there any noise?</li> </ul>	Yes	Go to the next step.
		No	The system is normal.
10	<ul style="list-style-type: none"> <li>• Inspect the ground condition of the manual antenna.</li> <li>• Is the ground condition normal?</li> </ul>	Yes	Repair or replace the ground. Go to the next step.
		No	Go to the next step.
11	<ul style="list-style-type: none"> <li>• Is there any noise?</li> </ul>	Yes	<b>Without Bose</b> <ul style="list-style-type: none"> <li>• Replace the audio unit.</li> </ul>

		<p>(See <b>CENTER PANEL UNIT REMOVAL/INSTALLATION.</b>)</p> <p>(See <b>CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</b>)</p> <p>(See <b>AUDIO UNIT DISASSEMBLY/ASSEMBLY.</b>)</p> <p><b>With Bose</b></p> <ul style="list-style-type: none"><li>• Replace the audio amplifier if any of the following occur:  (See <b>AUDIO AMPLIFIER REMOVAL/INSTALLATION.</b>)<ul style="list-style-type: none"><li>▪ The noise occurs from a specific speaker.</li><li>▪ Noise occurs when the volume is minimized.</li></ul></li><li>• Replace the audio unit if any of the following occur:  (See <b>CENTER PANEL UNIT REMOVAL/INSTALLATION.</b>)  (See <b>CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</b>)  (See <b>AUDIO UNIT DISASSEMBLY/ASSEMBLY.</b>)<ul style="list-style-type: none"><li>▪ The noise occurs from two or more speakers.</li><li>▪ No noise occurs when the volume is minimized.</li></ul></li></ul>
	No	The system is normal.



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### NO.2 NO POWER TO THE ENTIRE AUDIO SYSTEM [AUDIO]

2	No power to the entire audio system / Possible DTC: 09:Er20
<p><b>Troubleshooting hints</b></p> <ul style="list-style-type: none"> <li>• Poor connection of audio unit connector, terminal damage</li> <li>• Audio unit malfunction</li> <li>• Burnt fuse (B+)</li> <li>• Burnt fuse (ACC)</li> <li>• Open or short circuit in power supply (B+) wiring harness</li> <li>• Open or short circuit in power supply (ACC) wiring harness</li> </ul>	

### Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Inspect the following fuses: <ul style="list-style-type: none"> <li>▪ ACC</li> <li>▪ ROOM</li> </ul> </li> <li>• Are the fuses normal?</li> </ul>	Yes	Go to the next step.
		No	Replace with the appropriate standard fuse. <ul style="list-style-type: none"> <li>• If the fuse is melted, inspect the wiring harness for a short to ground. Repair or replace the wiring harness, then replace the fuse.</li> </ul>
2	<ul style="list-style-type: none"> <li>• Remove the audio unit.</li> <li>• Inspect the connection of the audio unit connector (24-pin).</li> <li>• Disconnect the audio unit connector and inspect both the audio unit and the wiring harness-side connectors for a poor connection. (such as damaged/pulled-out pins, corrosion).</li> </ul>	Yes	Go to the next step.
		No	<p><b>If audio unit connector has a poor connection:</b></p> <ul style="list-style-type: none"> <li>• Securely connect the audio unit connector.</li> </ul> <p><b>If the audio unit side</b></p>

	<ul style="list-style-type: none"> <li>▪ Terminal 1B (B+)</li> <li>▪ Terminal 1R (ACC)</li> <li>▪ Terminal 1W (GND)</li> </ul> <ul style="list-style-type: none"> <li>• Are all the pins normal?</li> </ul>		<p><b>connector is malfunctioning:</b></p> <ul style="list-style-type: none"> <li>• Replace the audio unit.</li> </ul> <p>(See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a>)</p> <p>(See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a>)</p> <p>(See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY.</a>)</p> <p><b>If the wiring harness-side connector is malfunctioning:</b></p> <ul style="list-style-type: none"> <li>• Repair or replace the pins and/or the connector.</li> </ul>
3	<ul style="list-style-type: none"> <li>• Connect the audio unit connector.</li> <li>• Inspect the voltage for the power supply line (B+, ACC).</li> </ul> <p><b>Specification:</b></p> <ul style="list-style-type: none"> <li>• <b>Ignition switch ON: 11.5 V or more</b></li> <li>• <b>Idle: 12.5 V or more</b></li> <li>• Is the voltage normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the related wiring harnesses.
4	<ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Remove the audio unit connector (24-pin).</li> <li>• Inspect the continuity between audio unit wiring harness-side connector terminal 1W and the ground.</li> <li>• Is there continuity?</li> </ul>	Yes	<p>Replace the audio unit.</p> <p>(See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a>)</p> <p>(See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a>)</p> <p>(See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY.</a>)</p>
		No	Repair or replace the wiring harness.

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NO.5 SCRATCHES ON THE CD [AUDIO]

5	Scratches on the CD Possible DTC:03:Er02, 06:Er02, 10:Er02, 22:Er02
<b>Troubleshooting hints</b> <ul style="list-style-type: none"><li>• Audio unit is malfunctioning</li><li>• Deformed disc is used (e.g., out of specification (thickness), bent disc)</li><li>• Multiple CDs are inserted into the CD player at the same time</li></ul>	

Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"><li>• Were multiple CDs inserted into the CD player at the same time?</li></ul>	Yes Explain to the customer to insert CDs one by one.
		No Go to the next step.
2	<ul style="list-style-type: none"><li>• Visually inspect the CD.</li><li>• Is the CD deformed disc (e.g., out of specification (thickness), bent disc)?</li></ul>	Yes Audio system is normal. Explain to the customer that the CD is malfunctioning.
		No Replace the audio unit.  (See <b>CENTER PANEL UNIT REMOVAL/INSTALLATION.</b> )  (See <b>CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</b> )  (See <b>AUDIO UNIT DISASSEMBLY/ASSEMBLY.</b> )



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### NO.5 SOUND BREAK-UP OR POOR SOUND QUALITY [AUDIO]

5	Sound break-up or poor sound quality / Possible DTC: 09:Er21
<p><b>Troubleshooting hints</b></p> <ul style="list-style-type: none"> <li>• Speaker malfunction (e.g., foreign material penetration, damage)</li> <li>• Improper speaker installation</li> <li>• Audio unit malfunction</li> <li>• Audio amplifier malfunction (with Bose)</li> <li>• Door trim and/or package trim vibration</li> </ul>	

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>• Is there sound break-up or poor sound quality from all speakers?</li> </ul>	Yes Go to the next step.
		No Go to Step 5.
2	<ul style="list-style-type: none"> <li>• Inspect the sound while adjusting the sound volume.</li> <li>• Is there sound break-up or poor sound quality between "15" and "20"?</li> </ul>	Yes Go to the next step.
		No The system is normal.
3	<ul style="list-style-type: none"> <li>• Inspect the BASS/TREB.</li> <li>• Is there poor sound quality between "-3 — +3" of the "BASS/TREB"?</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• When the AUDIO CONT button is pressed for a few seconds, BASS/TREB is set to "0".</li> </ul>	Yes Go to the next step.
		No If there is sound break-up between "-6—+6" of the BASS/TREB at the maximum volume, the system is normal.

4	<ul style="list-style-type: none"> <li>• Attempt to duplicate the symptom on another vehicle.</li> <li>• Is the sound quality better than the customer's vehicle?</li> </ul>	Yes	<p><b>Without Bose</b></p> <ul style="list-style-type: none"> <li>• Replace the audio unit.</li> </ul> <p>(See <b>CENTER PANEL UNIT REMOVAL/INSTALLATION.</b>)</p> <p>(See <b>CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</b>)</p> <p>(See <b>AUDIO UNIT DISASSEMBLY/ASSEMBLY.</b>)</p> <p><b>With Bose</b></p> <ul style="list-style-type: none"> <li>• Replace the audio amplifier if the following occurs:</li> </ul> <p>(See <b>AUDIO AMPLIFIER REMOVAL/INSTALLATION.</b>)</p> <ul style="list-style-type: none"> <li>▪ Noise occurs from a specific speaker.</li> </ul> <ul style="list-style-type: none"> <li>• Replace the audio unit if the following occurs:</li> </ul> <p>(See <b>CENTER PANEL UNIT REMOVAL/INSTALLATION.</b>)</p> <p>(See <b>CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</b>)</p> <p>(See <b>AUDIO UNIT DISASSEMBLY/ASSEMBLY.</b>)</p> <ul style="list-style-type: none"> <li>▪ Noise occurs from two or more speakers.</li> </ul>	No	The system is normal.
5	<ul style="list-style-type: none"> <li>• Identify the speaker with sound break-up by adjusting BAL/FADE.</li> <li>• Is the suspect speaker pointed upward?</li> </ul>	Yes	Go to Step 7.	No	Go to the next step.
6	<ul style="list-style-type: none"> <li>• Inspect the speaker installation condition.</li> <li>• Is the speaker installed properly?</li> </ul>	Yes	Go to the next step.	No	Install the speaker properly.
7	<ul style="list-style-type: none"> <li>• Remove the speaker.</li> </ul>	Yes	Repair or replace the suspect speaker.		

	<ul style="list-style-type: none"> <li>Is there any foreign material penetration or damage to the speaker?</li> </ul>	No	Go to the next step.
8	<ul style="list-style-type: none"> <li>Inspect the sound again.</li> <li>Is there sound break-up?</li> </ul>	Yes	Go to the next step.
		No	Inspect for vibration from the door trim and/or package trim. Repair or replace the suspect trim if necessary.
9	<ul style="list-style-type: none"> <li>Replace with a speaker known to be operational. (e.g., swap right and left speakers)</li> <li>Is the sound break-up heard at the same location?</li> </ul>	Yes	<p><b>Without Bose</b></p> <ul style="list-style-type: none"> <li>Replace the audio unit.</li> </ul> <p>(See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a>)</p> <p>(See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a>)</p> <p>(See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY.</a>)</p> <p><b>With Bose</b></p> <ul style="list-style-type: none"> <li>Replace the audio amplifier if the following occurs:</li> </ul> <p>(See <a href="#">AUDIO AMPLIFIER REMOVAL/INSTALLATION.</a>)</p> <ul style="list-style-type: none"> <li>Noise occurs from a specific speaker.</li> </ul> <ul style="list-style-type: none"> <li>Replace the audio unit if the following occurs:</li> </ul> <p>(See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a>)</p> <p>(See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a>)</p> <p>(See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY.</a>)</p> <ul style="list-style-type: none"> <li>Noise occurs from two or more speakers.</li> </ul>
		No	<p>Replace the speaker.</p> <p>(See <a href="#">DOOR SPEAKER REMOVAL/INSTALLATION.</a>)</p> <p>(See <a href="#">REAR SPEAKER REMOVAL/INSTALLATION.</a>)</p> <p>(See <a href="#">CENTER SPEAKER REMOVAL/INSTALLATION.</a>)</p>



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### NO.6 VOLUME INCREASES/DECREASES WHILE DRIVING THE VEHICLE [AUDIO]

6 Volume increases/decreases while driving the vehicle / Possible DTC: —

#### Troubleshooting hints

- Audio unit malfunction (without Bose)
- Audio amplifier malfunction (with Bose)

#### NOTE:

- Inspect the ALC function (without Bose) or Audio Pilot function (with Bose) while driving the vehicle and playing a CD.

#### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>• Does the ALC function or AudioPilot function turn on?</li> </ul>	Yes Go to the next step.
		<b>No</b> <p><b>Without Bose</b></p> <ul style="list-style-type: none"> <li>• Replace the audio unit.</li> </ul> <p>(See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a>)</p> <p>(See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a>)</p> <p>(See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY.</a>)</p> <p><b>With Bose</b></p> <ul style="list-style-type: none"> <li>• Replace the audio amplifier if the following occurs:</li> </ul> <p>(See <a href="#">AUDIO AMPLIFIER REMOVAL/INSTALLATION.</a>)</p> <ul style="list-style-type: none"> <li>▪ The volume changes suddenly.</li> </ul>

2	<ul style="list-style-type: none"><li>• Turn the ALC function or AudioPilot function off.</li><li>• Does the sound change while driving the vehicle?</li></ul>	Yes	Replace the audio unit.  (See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a> )  (See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a> )  (See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY.</a> )
		No	The system is normal. Explain the ALC function to the customer.

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### NO.8 AUDIO PILOT FUNCTION IS INOPERATIVE [AUDIO]

8 AudioPilot function is inoperative / Possible DTC: —

#### Troubleshooting hints

- Audio amplifier malfunction
- Open or short circuit in Mic unit signal wiring harness
- Open or short circuit in AudioPilot signal wiring harness

#### NOTE:

- Inspect the AudioPilot function while driving the vehicle and playing a CD.

#### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>• Turn the AudioPilot function on.</li> <li>• Inspect the AudioPilot function operation while driving the vehicle.</li> <li>• Does the AudioPilot system operate properly?</li> </ul>	Yes The system is normal. Explain the AudioPilot function to the customer.
		No Go to the next step.
2	<ul style="list-style-type: none"> <li>• Inspect the connection of the audio unit connector (24-pin, AudioPilot signal).</li> <li>• Inspect both the audio unit and wiring harness-side connector terminal T for a poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Are all the pins normal?</li> </ul>	Yes Repair or replace the pins and/or the connector.
		No Go to the next step.
3	<ul style="list-style-type: none"> <li>• Inspect the connection of the audio amplifier connector (24-pin, AudioPilot signal).</li> <li>• Inspect both the audio amplifier and wiring harness-side connector terminal B for a poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Are all the pins normal?</li> </ul>	Yes Repair or replace the pins and/or the connector.
		No Go to the next step.

4	<ul style="list-style-type: none"><li>• Inspect the connection of the audio unit connector (24-pin, Mic unit signal).</li><li>• Inspect both the audio amplifier and wiring harness-side connector terminals E and G for a poor connection (such as damaged/pulled-out pins, corrosion).</li><li>• Are all the pins normal?</li></ul>	Yes	Repair or replace the pins and/or the connector.
		No	Replace the audio amplifier.  (See <b>AUDIO AMPLIFIER REMOVAL/INSTALLATION.</b> )

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### NO.1 CD PLAYER/CHANGER DOES NOT LOAD THE CD OR EJECTS THE CD IMMEDIATELY [AUDIO]

1	<p>CD player/changer does not load the CD or ejects the CD immediately</p> <p>Possible DTC: 03:Er01, 03:Er10, 06:Er01, 06:Er10, 10:Er01, 10:Er10, 22:Er01, 22:Er10</p>
<p><b>Troubleshooting hints</b></p> <ul style="list-style-type: none"> <li>• CD is inserted upside down</li> <li>• Audio unit is malfunctioning</li> <li>• Defective CD (e.g., cracked, badly bent, rough edges, scratch, dirty CD, condensation)</li> <li>• Non-conventional discs (e.g., 8 cm (3 in) CD, 8 cm (3 in) disc adapter, heart-shaped disc, octagonal disc)</li> <li>• Poor connection of audio unit connector or terminal (e.g., damaged, bent, pulled-out pin, corrosion)</li> <li>• Deformed disc is used (e.g., out of specification (thickness), bent disc)</li> </ul>	

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>• Is CD inserted properly, label-side up?</li> </ul>	Yes Go to the next step.
		No Explain to the customer that the CD should be inserted into the slot label-side up.
2	<ul style="list-style-type: none"> <li>• Replace with a CD known to be operational.</li> <li>• Does the CD player/changer load the CD?</li> </ul>	Yes Go to the next step.
		No Replace the audio unit. (See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION</a> .) (See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY</a> .) (See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY</a> .)

3	<p>Visually inspect the CD.</p> <ul style="list-style-type: none"> <li>▪ Is there any dirt, scratches or deformation on the CD?</li> <li>▪ Is the CD a non-conventional disc?</li> </ul>	Yes	Explain to the customer that the defective CD or non-conventional disc cannot be used.
		No	Go to the next step.
4	<ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Inspect the connection of the audio unit connector (24-pin).</li> <li>• Inspect both the audio unit connector and wiring harness-side connector for a poor connection. (such as damaged/bent/pulled-out pins, corrosion)</li> <li>• All the pins and connector normal?</li> </ul>	Yes	<p>Replace the audio unit.</p> <p>(See <b>CENTER PANEL UNIT REMOVAL/INSTALLATION.</b>)</p> <p>(See <b>CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</b>)</p> <p>(See <b>AUDIO UNIT DISASSEMBLY/ASSEMBLY.</b>)</p>
		No	<p><b>If the audio unit connector/pin is malfunctioning:</b></p> <ul style="list-style-type: none"> <li>• Replace the audio unit.</li> </ul> <p>(See <b>CENTER PANEL UNIT REMOVAL/INSTALLATION.</b>)</p> <p>(See <b>CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</b>)</p> <p>(See <b>AUDIO UNIT DISASSEMBLY/ASSEMBLY.</b>)</p> <p><b>If the wiring harness-side connector/pin is malfunctioning:</b></p> <ul style="list-style-type: none"> <li>• Repair or replace the pins and/or the connector.</li> </ul>

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### NO.2 CD PLAYER/CHANGER DOES NOT EJECT THE CD [AUDIO]

2	<p>CD player/changer does not eject the CD</p> <p>Possible DTC:03:Er01, 06:Er01, 10:Er01, 22:Er01</p>
<p><b>Troubleshooting hints</b></p> <ul style="list-style-type: none"> <li>• Audio units is malfunctioning</li> <li>• Defective CD. (e.g., cracked, badly bent, rough edges, scratch, dirty CD, condensation)</li> <li>• Non-conventional discs (e.g., 8 cm (3 in) CD, 8 cm (3 in) disc adapter, heart-shaped disc, octagonal disc)</li> <li>• Poor connection of audio unit connector or terminal (e.g., damaged, bent, pulled-out pin, corrosion)</li> <li>• Improper center panel installation</li> <li>• Improper CD cover installation</li> <li>• Deformed disc is used (e.g., out of specification (thickness), bent disc).</li> <li>• Multiple CDs are inserted into the CD player at the same time</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• The CD may be malfunctioning if the CD player/changer does not eject a certain CD only. Inspect the CD player/changer operation using a CD known to be operational.</li> </ul>	

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>• Inspect the operation of the audio system other than the CD player/changer (e.g. Radio).</li> <li>• Does the other audio system operate?</li> </ul>	Yes Go to Step 3.
		No Go to the next step.
2	<ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Inspect the connection of the audio unit connector (24-pin).</li> </ul>	Yes Go to the next step.
		No <b>If the audio unit connector/pin is</b>

	<ul style="list-style-type: none"><li>Inspect both audio unit connector and wiring harness-side connector for poor connection. (such as damaged/bent/pulled-out pins, corrosion)</li><li>Are all the pins and connectors normal?</li></ul>		<p><b>malfunctioning:</b></p> <ul style="list-style-type: none"><li>Replace the audio unit.</li></ul> <p>(See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a>)</p> <p>(See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a>)</p> <p>(See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY.</a>)</p> <p><b>If the wiring harness-side connector/pin is malfunctioning:</b></p> <ul style="list-style-type: none"><li>Repair or replace the pins and/or the connector.</li></ul>
3	<ul style="list-style-type: none"><li>Eject the CD.</li><li>Is the CD ejected from the CD player/changer?</li></ul>	Yes	Go to the next step.
		No	Inspect the center panel and CD cover installation. Securely install the center panel and/or CD cover if necessary.
4	<ul style="list-style-type: none"><li>Insert the CD into the CD player/changer.</li><li>Does the CD insert into the CD player/changer smoothly?</li></ul>	Yes	Replace the audio unit.
		No	Install the center panel and/or CD cover properly, then go to the next step.
5	<ul style="list-style-type: none"><li>Is the CD ejected from the CD player/changer?</li></ul>	Yes	Troubleshooting completed.
		No	Replace the audio unit.



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### NO.9 NO AUDIO SYSTEM ILLUMINATION [AUDIO]

9 No audio system illumination / Possible DTC: 09:Er20, 21:Er19

#### Troubleshooting hints

- Poor connection of audio unit connector, terminal damage
- Audio unit malfunction
- Burnt fuse (TNS signal)
- Open or short circuit in TNS signal wiring harness
- Center panel malfunction

#### Diagnostic procedure

STEP	INSPECTION		ACTION
1	<ul style="list-style-type: none"> <li>• Is all the illumination on the audio unit turned off?</li> </ul>	Yes	Go to the next step.
		No	Replace the center panel. (See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a> ) (See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a> )
2	<ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Inspect the fuse (ILLUMI).</li> <li>• Is the fuse normal?</li> </ul>	Yes	Go to the Step 4.
		No	Go to the next step.
3	<ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Disconnect the audio unit connector (24-pin) and inspect the continuity between the audio unit wiring harness-side connector terminal 1E</li> </ul>	Yes	Repair or replace the short circuit in the suspect wiring harness. After repairing the wiring harness, replace with the appropriate standard fuse.
		No	Go to the next step.

	(TNS) and the ground.		
	<ul style="list-style-type: none"> <li>Is there continuity?</li> </ul>		
4	<ul style="list-style-type: none"> <li>Inspect the connection of the audio unit connector (24-pin).</li> <li>Inspect both the audio unit and wiring harness-side connector terminal 1E for a poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Are all the pins normal?</li> </ul>	Yes	Go to the next step.
		No	<p><b>If audio unit connector has a poor connection:</b></p> <ul style="list-style-type: none"> <li>Securely connect the audio unit connector.</li> </ul> <p><b>If the audio unit side connector is malfunctioning:</b></p> <ul style="list-style-type: none"> <li>Replace the audio unit.</li> </ul> <p>(See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a>)</p> <p>(See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a>)</p> <p>(See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY.</a>)</p> <p><b>If the wiring harness-side connector is malfunctioning:</b></p> <ul style="list-style-type: none"> <li>Repair or replace the pins and/or the connector.</li> </ul>
5	<ul style="list-style-type: none"> <li>Connect the audio unit connector (24-pin).</li> <li>Turn the ignition switch to the ACC position.</li> <li>Inspect the voltage at the audio unit connector terminal 1E (TNS).</li> <li>Is the voltage <b>B+</b> when the light switch is turned to the TNS position?</li> </ul>	Yes	<p>Replace the audio unit.</p> <p>(See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a>)</p> <p>(See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a>)</p> <p>(See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY.</a>)</p>
		No	Repair or replace the related wiring harness (TNS signal).

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### DTC TABLE [AUDIO]

Screen display		
DTC (When starting on-board diagnostic test function)	Detection condition	Possible cause/inspection
03: Er01	CD player cannot implement insert and eject commands.	CD player malfunction
03: Er02	Cannot change tracks.	CD player malfunction
03: Er07	CD reading error.	<ul style="list-style-type: none"> <li>Defective CD (scratches or dirt)</li> <li>CD player malfunction</li> </ul>
03: Er10	CD player does not operate.	<ul style="list-style-type: none"> <li>Malfunction of connectors between base unit and CD player</li> <li>CD player malfunction</li> </ul>
05: Er01	CD changer (external) cannot implement insert, eject, and disc change commands.	<ul style="list-style-type: none"> <li>Defective CD (curved, broken or foreign material stuck/attached, etc.)</li> <li>CD changer (external) malfunction</li> </ul>
05: Er07	CD reading error.	<ul style="list-style-type: none"> <li>Defective CD (curved, broken or foreign material stuck/attached, etc.)</li> <li>CD changer (external) malfunction</li> </ul>
	CD changer (external) does not operate.	<ul style="list-style-type: none"> <li>Defective CD (curved, broken or foreign material</li> </ul>



05: Er10		<p>stuck/attached, etc.)</p> <ul style="list-style-type: none"> <li>• CD changer (external) malfunction</li> </ul>
06: Er01	CD changer cannot implement insert, eject, and disc change commands.	<ul style="list-style-type: none"> <li>• Defective CD (curved, broken or foreign material stuck/attached, etc.)</li> <li>• CD changer malfunction</li> </ul>
06: Er02	Cannot change tracks.	<ul style="list-style-type: none"> <li>• Defective CD (curved, broken or foreign material stuck/attached, etc.)</li> <li>• CD changer malfunction</li> </ul>
06: Er07	CD reading error.	<ul style="list-style-type: none"> <li>• Defective CD (curved, broken or foreign material stuck/attached, etc.)</li> <li>• CD changer malfunction</li> </ul>
06: Er10	CD changer does not operate.	<ul style="list-style-type: none"> <li>• Malfunction of connectors between base unit and CD changer</li> <li>• CD changer malfunction</li> </ul>
07: Er01	MD player cannot implement insert and eject commands.	MD player malfunction
07: Er02	Cannot change tracks.	MD player malfunction
07: Er07	MD reading error.	Defective MD
07: Er08	Blank unrecorded MD is inserted.	Defective MD
07: Er10	MD player does not operate.	<ul style="list-style-type: none"> <li>• Malfunction of connectors between base unit and MD player</li> <li>• MD player malfunction</li> </ul>
09: Er20	Audio system does not operate.	Voltage at base unit is low.
09: Er21	Broken sound/No sound	Inspect the audio system operation according to vehicle condition.
09: Er22	No radio reception	Inspect the radio operation according to vehicle condition.

10: Er01	MP3 applicable CD player cannot implement insert and eject commands.	MP3 applicable CD player malfunction
10: Er02	Cannot change tracks.	MP3 applicable CD player malfunction
10: Er07	MP3 CD reading error.	Incorrect format CD
10: Er10	MP3 applicable CD player does not operate.	<ul style="list-style-type: none"> <li>• Malfunction of connectors between base unit and MP3 applicable CD player</li> <li>• MP3 applicable CD player malfunction</li> </ul>
11: Er01	SSI bus communication error	<ul style="list-style-type: none"> <li>• Poor connection of the connectors</li> <li>• Radio unit malfunction</li> <li>• Sirius unit malfunction</li> </ul>
11: Er03	Poor connection of antenna	<ul style="list-style-type: none"> <li>• Poor connection of antenna connector</li> </ul>
11: Er10	Radio system does not operate.	<ul style="list-style-type: none"> <li>• Malfunction of connectors between base unit and Sirius unit</li> <li>• Sirius unit malfunction</li> </ul>
21: Er17	Incorrect combination (base unit and center panel)	Install the correct base unit or the center panel.
21: Er18		
21: Er19	Communication error between base unit and center panel	Malfunction of connectors between base unit and center panel
22: Er01	MP3 applicable CD changer cannot implement insert, eject, and disc change commands.	<ul style="list-style-type: none"> <li>• Defective CD (curved, broken or foreign material stuck/attached, etc.)</li> <li>• MP3 applicable CD changer malfunction</li> </ul>
22: Er02	Cannot change tracks.	<ul style="list-style-type: none"> <li>• Defective CD (curved, broken or foreign material stuck/attached, etc.)</li> <li>• MP3 applicable CD changer malfunction</li> </ul>

22: Er07	CD reading error.	<ul style="list-style-type: none"> <li>• Defective CD (curved, broken or foreign material stuck/attached, etc.)</li> <li>• MP3 applicable CD changer malfunction</li> </ul>
22: Er10	MP3 applicable CD changer does not operate.	<ul style="list-style-type: none"> <li>• Malfunction of connectors between base unit and MP3 applicable CD changer</li> <li>• MP3 applicable CD changer malfunction</li> </ul>
no Err	No DTCs stored	No DTCs stored

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NO.3 NO SOUND FROM ALL SPEAKERS (VEHICLES WITH Bose) [AUDIO]

3

No sound from all the speakers / Possible DTC: 03:Er07, 03:Er10, 06:Er07, 06:Er10, 09:Er20, 09:Er21, 10:Er10, 22:Er07, 22:Er10

Troubleshooting hints

- Speaker malfunction (e.g., foreign material penetration, damage)
- Audio amplifier malfunction
- Open or short circuit in wiring harness between audio amplifier and speaker
- Open or short circuit in wiring harness between audio amplifier and audio unit.
- Short circuit inside speaker

Diagnostic procedure

STEP	INSPECTION		ACTION
1	<ul style="list-style-type: none"><li>• Press the AUDIO CONT button for <b>2 s or more</b>.</li><li>• Play the CD or radio.</li><li>• Adjust the volume between "10" and "15".</li><li>• Is there sound?</li></ul>	Yes	The system is normal.
		No	Go to the next step.
2	<ul style="list-style-type: none"><li>• Measure the voltage at audio amplifier terminal A. (vehicle wiring harness-side)</li><li>• Is the voltage B+ ?</li></ul>	Yes	Go to Step 4.
		No	Repair or replace the wiring harness between the audio amplifier and fuse. Go to the next step.
3	<ul style="list-style-type: none"><li>• Is there any sound?</li></ul>	Yes	The system is normal.
		No	Go to the next step.
4	<ul style="list-style-type: none"><li>• Turn the ignition switch to the LOCK position.</li></ul>	Yes	Go to the next step.

	<ul style="list-style-type: none"><li>• Disconnect the audio amplifier connector (8-pin, 24-pin).</li><li>• Inspect the continuity between the following terminals of the audio amplifier connector and the speaker connector:  <b>For door speaker (LH)</b><ul style="list-style-type: none"><li>▪ Terminal 1M, 1I — Terminal B</li><li>▪ Terminal 1K, 1O — Terminal A</li></ul><b>For door speaker (RH)</b><ul style="list-style-type: none"><li>▪ Terminal 2C, 2E — Terminal A</li><li>▪ Terminal 2D, 2F — Terminal B</li></ul><b>For rear speakers</b><ul style="list-style-type: none"><li>▪ Terminal 1U — Terminal B</li><li>▪ Terminal 1W — Terminal A</li></ul><b>For center speaker</b><ul style="list-style-type: none"><li>▪ Terminal 1Q — Terminal B</li><li>▪ Terminal 1S — Terminal A</li></ul></li><li>▪ Is there continuity?</li></ul>	No	Repair or replace the related wiring harnesses.
5	<ul style="list-style-type: none"><li>• Turn the ignition switch to the LOCK position.</li><li>• Disconnect the audio amplifier connector (8-pin, 24-pin).</li><li>• Inspect the continuity between the audio amplifier connector</li></ul>	Yes	<p>Repair or replace the related wiring harnesses or the speaker unit.</p> <p><b>NOTE:</b></p> <ul style="list-style-type: none"><li>• If there is a short circuit between the speaker wiring harnesses or the speaker lead wire and ground,</li></ul>

and ground:

**For door  
speakers**

- Terminal 1M  
(24-pin, LH  
OUT+) —  
GND
- Terminal 1I  
(24-pin, LH  
OUT+) —  
GND
- Terminal 1K  
(24-pin, LH  
OUT-) — GND
- Terminal 1O  
(24-pin, LH  
OUT-) — GND
- Terminal 2C  
(8-pin, RH  
OUT-) — GND
- Terminal 2D  
(8-pin, RH  
OUT+) —  
GND
- Terminal 2F  
(8-pin, RH  
OUT+) —  
GND
- Terminal 2E  
(8-pin, RH  
OUT-) — GND

**For rear  
speakers**

- Terminal 1U  
(24-pin,  
OUT+) —  
GND
- Terminal 1W  
(24-pin, OUT-  
) — GND

**For center  
speaker**

- Terminal 1Q  
(24-pin,  
OUT+) —  
GND

the protector circuit inside the  
audio unit operates to cut the  
sound.

No Go to the next step.

	<ul style="list-style-type: none"> <li>Terminal 1S (24-pin, OUT-) — GND</li> </ul>		
	<ul style="list-style-type: none"> <li>Is there continuity?</li> </ul>		
6	<ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the audio amplifier connector (24-pin) and audio unit connector (24-pin).</li> <li>Inspect the continuity between audio amplifier terminal 1V (vehicle wiring harness-side) and the audio unit terminal 1J (vehicle wiring harness-side).</li> <li>Is there continuity?</li> </ul>	Yes	Replace the audio amplifier. (See <a href="#">AUDIO AMPLIFIER REMOVAL/INSTALLATION.</a> )
		No	Repair or replace the wiring harness between the audio amplifier and the audio unit. Go to the next step.
7	<ul style="list-style-type: none"> <li>Is there any sound?</li> </ul>	Yes	The system is normal.
		No	Replace the audio amplifier. (See <a href="#">AUDIO AMPLIFIER REMOVAL/INSTALLATION.</a> )

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NO.3 NO SOUND FROM ALL SPEAKERS (VEHICLES WITHOUT Bose) [AUDIO]

3

No sound from all speakers / Possible DTC: 03:Er07, 03:Er10, 06:Er07, 06:Er10, 09:Er20, 09:Er21, 10:Er10, 22:Er07, 22:Er10

Troubleshooting hints

- Speaker malfunction (e.g., foreign material penetration, damage)
- Audio unit malfunction
- Short circuit in wiring harness between audio unit and speaker
- Short circuit inside speaker

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<ul style="list-style-type: none"><li>• Press the AUDIO CONT button for <b>2 s or more</b>.</li><li>• Play the CD or radio.</li><li>• Adjust the volume between "10" and "15".</li><li>• Is there any sound?</li></ul>	Yes	The system is normal.
		No	Go to the next step.
2	<ul style="list-style-type: none"><li>• Turn the ignition switch to the LOCK position.</li><li>• Remove the audio unit.</li><li>• Disconnect the audio connector (24-pin).</li><li>• Inspect the continuity between the audio unit wiring harness-side connector terminal and ground:</li></ul> <div>For front speakers</div>	Yes	Repair or replace the related wiring harnesses or the speaker unit.  <b>NOTE:</b> <ul style="list-style-type: none"><li>• If there is a short circuit between the speaker wiring harnesses or the speaker lead wire and ground, the protector circuit inside the audio unit operates to cut the sound.</li></ul>
		No	Replace the audio unit.  (See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a> ) (See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a> )



- Terminal  
1A (LH+)  
— GND

- Terminal  
1C (LH-)  
— GND

- Terminal  
1D (RH+)  
— GND

- Terminal  
1F (RH-)  
— GND

**For rear  
speakers**

- Terminal  
1S (LH+)  
— GND

- Terminal  
1U (LH-)  
— GND

- Terminal  
1V (RH+)  
— GND

- Terminal  
1X (RH-)  
— GND

- Is there continuity?

(See [AUDIO UNIT DISASSEMBLY/ASSEMBLY](#).)

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NO.4 NO SOUND FROM SOME SPEAKERS (VEHICLES WITH Bose) [AUDIO]

4	No sound from some speakers / Possible DTC: —
<div><div>Troubleshooting hints</div><ul style="list-style-type: none"><li>• Speaker malfunction (e.g., foreign material penetration, damage)</li><li>• Audio amplifier malfunction</li><li>• Short circuit inside speaker</li><li>• Open or short circuit in wiring harness between audio amplifier and speaker</li><li>• Open or short circuit in wiring harness between audio amplifier and audio unit</li><li>• Poor connection of audio unit connector, terminal damage</li><li>• Poor connection of audio amplifier connector</li></ul></div>	

Diagnostic procedure

STEP	INSPECTION		ACTION
1	<div><ul style="list-style-type: none"><li>• Turn the audio unit on.</li><li>• Press the AUDIO CONT button <b>1 s or more</b> (BAL/FAD cancel mode).</li><li>• Press the POWER button and simultaneously press down the SCAN/AUTO-M switch for approx. 2 s.</li></ul></div> <div><div>NOTE:</div><ul style="list-style-type: none"><li>• This function outputs sound to each speaker sequentially to allow determination of which speaker is not emitting sound.</li><li>• Is there any speaker that does not output sound?</li></ul></div>	Yes	<div><div>If there is no sound from some speakers:</div><ul style="list-style-type: none"><li>• Go to the next step.</li></ul><div>If there is no sound at all:</div><ul style="list-style-type: none"><li>• Go to troubleshooting “No.3 No sound from all speakers”.</li></ul></div>
		No	The troubleshooting is completed.

2	Does the same speaker output no sound if the audio source is changed? (Radio, CD)	Yes	Go to the next step.
		No	Replace the audio unit.  (See <b>CENTER PANEL UNIT REMOVAL/INSTALLATION.</b> )  (See <b>CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</b> )  (See <b>AUDIO UNIT DISASSEMBLY/ASSEMBLY.</b> )  <b>NOTE:</b> <ul style="list-style-type: none"> <li>If a different speaker outputs no sound, the audio unit is malfunctioning.</li> </ul>
3	<ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Inspect the connection of the audio unit connector (24-pin). (For sound signal line)</li> <li>Is the connector connected securely?</li> </ul>	Yes	Go to the next step.
		No	Connect the audio unit connector (24-pin) securely.
4	<ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Remove the audio unit.</li> <li>Disconnect the audio unit connector (24-pin).</li> <li>Inspect the continuity between the audio unit wiring harness-side connector and ground.</li> </ul> <p><b>For door speakers</b></p> <ul style="list-style-type: none"> <li>Terminal 1A (LH+) — GND</li> <li>Terminal 1C (LH-) — GND</li> <li>Terminal 1D (RH+) — GND</li> <li>Terminal 1F (RH-) — GND</li> </ul> <p><b>For rear speakers</b></p> <ul style="list-style-type: none"> <li>Terminal 1S</li> </ul>	Yes	Go to the next step.
		No	Go to Step 6.

	<p>(LH+) — GND</p> <ul style="list-style-type: none"> <li>Terminal 1U (LH-) — GND</li> <li>Terminal 1V (RH+) — GND</li> <li>Terminal 1X (RH-) — GND</li> </ul> <p>• Is there continuity?</p>		
5	<p>• Inspect the continuity between the following terminals of the audio amplifier wiring harness-side connector (24-pin) and the audio unit wiring harness-side connector (24-pin).</p> <p><b>For door speakers</b></p> <ul style="list-style-type: none"> <li>Terminal 1T (LH+) — Terminal 1A (LH+)</li> <li>Terminal 1R (LH-) — Terminal 1C (LH-)</li> <li>Terminal 1P (RH+) — Terminal 1D (RH+)</li> <li>Terminal 1N (RH-) — Terminal 1F (RH-)</li> </ul> <p><b>For rear speakers</b></p> <ul style="list-style-type: none"> <li>Terminal 1L (LH+) — Terminal 1S (LH+)</li> <li>Terminal 1J (LH-) — Terminal 1U (LH-)</li> <li>Terminal 1H (RH+) — Terminal 1X (RH-)</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the related wiring harnesses between the audio amplifier and the audio unit. Go to the next step.

	<p>Terminal 1F (RH-) — Terminal 1V (RH+)</p> <ul style="list-style-type: none"> <li>Is there continuity?</li> </ul>		
6	<ul style="list-style-type: none"> <li>Inspect the connection of the audio amplifier connector (24-pin, 8-pin).</li> <li>Is the connector connected securely?</li> </ul>	Yes	Go to the next step.
		No	Connect the audio amplifier connector (24-pin, 8-pin) securely.
7	<ul style="list-style-type: none"> <li>Disconnect the audio amplifier (24-pin) and the speaker connector.</li> <li>Inspect the continuity between the following terminals of the audio amplifier connector (24-pin) and the speaker connector. <ul style="list-style-type: none"> <li><b>For door speaker (LH)</b> <ul style="list-style-type: none"> <li>Terminal 1M, 1I — Terminal B</li> <li>Terminal 1K, 1O — Terminal A</li> </ul> </li> <li><b>For door speaker (RH)</b> <ul style="list-style-type: none"> <li>Terminal 2C, 2E — Terminal A</li> <li>Terminal 2D, 2F — Terminal B</li> </ul> </li> <li><b>For rear speakers</b> <ul style="list-style-type: none"> <li>Terminal 1U — Terminal B</li> <li>Terminal 1W — Terminal A</li> </ul> </li> <li><b>For center speaker</b> <ul style="list-style-type: none"> <li>Terminal 1Q — Terminal B</li> <li>Terminal 1S — Terminal A</li> </ul> </li> </ul> </li> <li>Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the related wiring harnesses.

8	<ul style="list-style-type: none"><li>Inspect the continuity between the following terminals of the audio amplifier wiring harness-side connector (24-pin) and ground.  <b>For door speakers</b><ul style="list-style-type: none"><li>Terminal 1M (LH OUT+) — GND</li><li>Terminal 1K (LH OUT-) — GND</li><li>Terminal 1I (LH OUT-) — GND</li><li>Terminal 1O (LH OUT+) — GND</li><li>Terminal 2C (RH OUT-) — GND</li><li>Terminal 2D (RH OUT+) — GND</li><li>Terminal 2F (RH OUT+) — GND</li><li>Terminal 2E (RH OUT-) — GND</li></ul><b>For rear speakers</b><ul style="list-style-type: none"><li>Terminal 1U (LH OUT+) — GND</li><li>Terminal 1W (RH OUT-) — GND</li></ul><b>For center speaker</b><ul style="list-style-type: none"><li>Terminal 1Q (OUT+) — GND</li><li>Terminal 1S (OUT-) — GND</li></ul></li><li>Is there continuity?</li></ul>	Yes	Repair or replace for a short circuit between the audio amplifier and speaker wiring harnesses or inside the speaker unit.  <b>NOTE:</b> <ul style="list-style-type: none"><li>If there is a short circuit between the speaker wiring harnesses or the speaker lead wire and ground, the protector circuit inside the audio amplifier operates to cut the sound.</li></ul>
		No	Go to the next step.
9	<ul style="list-style-type: none"><li>Remove the suspect speaker.</li><li>Disconnect the speaker connector (2-pin) and inspect the resistance of the speaker.</li><li>Is the resistance normal?</li></ul>	Yes	Replace the audio amplifier. (See <b>AUDIO AMPLIFIER REMOVAL/INSTALLATION.</b> )
		No	Replace the speaker.  (See <b>DOOR SPEAKER REMOVAL/INSTALLATION.</b> )

	<p><b>Specification:</b></p> <ul style="list-style-type: none"><li>• Speaker resistance + wiring harness resistance</li></ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"><li>• If the speaker lead wire contacts either the ground or vehicle frame, replace the speaker.</li></ul>	<p>(See <a href="#">REAR SPEAKER REMOVAL/INSTALLATION.</a>)</p> <p>(See <a href="#">CENTER SPEAKER REMOVAL/INSTALLATION.</a>)</p>
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NO.4 NO SOUND FROM SOME SPEAKERS (VEHICLES WITHOUT Bose) [AUDIO]

4	No sound from some speakers / Possible DTC: —
<div><div>Troubleshooting hints</div><ul style="list-style-type: none"><li>• Speaker malfunction (e.g., foreign material penetration, damage)</li><li>• Audio unit malfunction</li><li>• Short circuit inside speaker</li><li>• Open or short circuit in wiring harness between audio unit and speaker</li><li>• Poor connection of audio unit connector, terminal damage</li></ul></div>	

Diagnostic procedure

STEP	INSPECTION	ACTION
1	<div><ul style="list-style-type: none"><li>• Turn the audio unit on.</li><li>• Press the AUDIO CONT button <b>1 s or more</b> (BAL/FAD cancel mode).</li><li>• Press the POWER button and simultaneously press down the SCAN/AUTO-M switch for approx. 2 s.</li></ul><div>NOTE:</div><ul style="list-style-type: none"><li>• The speaker outputting sound changes in the order of left— door speaker, right — door speaker, left — rear speaker and right — rear speaker.</li></ul></div>	Yes <div><div>If no sound from some speaker:</div><ul style="list-style-type: none"><li>• Go to the next step.</li></ul><div>If no sound at all:</div><ul style="list-style-type: none"><li>• Go to the troubleshooting of "No.3 No sound from all speakers".</li></ul></div>
		No <div>The troubleshooting is completed.</div>



	Is there any speaker that does not output sound?		
2	<ul style="list-style-type: none"><li>Does the same speaker output no sound if the audio source is changed? (Radio, CD)</li></ul>	Yes	Go to the next step.
		No	Replace the audio unit.  (See <b>CENTER PANEL UNIT REMOVAL/INSTALLATION.</b> )  (See <b>CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</b> )  (See <b>AUDIO UNIT DISASSEMBLY/ASSEMBLY.</b> )  <b>NOTE:</b> <ul style="list-style-type: none"><li>If a different speaker outputs no sound, the audio unit is malfunctioning.</li></ul>
3	<ul style="list-style-type: none"><li>Turn the ignition switch to the LOCK position.</li><li>Inspect the connection of the audio unit connector (24-pin). (for sound signal line)</li><li>Is the connector connected securely?</li></ul>	Yes	Go to the next step.
		No	Connect the audio unit connector (24-pin) securely.
4	<ul style="list-style-type: none"><li>Turn the ignition switch to the LOCK position.</li><li>Remove the audio unit.</li><li>Disconnect the audio unit connector (24-pin).</li><li>Inspect the continuity between the audio unit wiring harness-side connector and ground.</li></ul> <p><b>For door speakers</b></p> <ul style="list-style-type: none"><li>Terminal 1A (LH+) — GND</li><li>Terminal 1C (LH-) — GND</li><li>Terminal 1D (RH+) — GND</li><li>Terminal 1F (RH-) — GND</li></ul>	Yes	Repair or replace the related wiring harnesses or speaker unit.  <b>NOTE:</b> <ul style="list-style-type: none"><li>If there is a short circuit between the speaker wiring harnesses or the speaker lead wire and ground, the protector circuit inside the audio unit operates to cut the sound.</li></ul>
		No	Go to the next step.

	<p><b>For rear speakers</b></p> <ul style="list-style-type: none"> <li>▪ Terminal 1S (LH+) — GND</li> <li>▪ Terminal 1U (LH-) — GND</li> <li>▪ Terminal 1V (RH+) — GND</li> <li>▪ Terminal 1X (RH-) — GND</li> </ul> <ul style="list-style-type: none"> <li>• Is there continuity?</li> </ul>		
5	<ul style="list-style-type: none"> <li>• Remove the suspect speaker.</li> <li>• Disconnect the speaker connector (2-pin) and inspect the resistance of the speaker.</li> <li>• Is the resistance normal?</li> </ul> <p><b>Specification:</b></p> <ul style="list-style-type: none"> <li>• Speaker resistance + wiring harness resistance</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• If the speaker lead wire contacts either the ground or vehicle frame, replace the speaker.</li> </ul>	Yes	Replace the speaker.  (See <a href="#">DOOR SPEAKER REMOVAL/INSTALLATION.</a> )  (See <a href="#">REAR SPEAKER REMOVAL/INSTALLATION.</a> )  (See <a href="#">CENTER SPEAKER REMOVAL/INSTALLATION.</a> )
		No	Replace the audio unit.  (See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a> )  (See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a> )  (See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY.</a> )

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### TROUBLESHOOTING INDEX [IMMOBILIZER SYSTEM]

No.	TROUBLESHOOTING ITEM	DESCRIPTION
1	The security light display is not normal.	<ul style="list-style-type: none"><li>• The security light remains illuminated 2 min or more after the ignition switch is turned to the ON position.</li><li>• The security does not illuminate when the ignition switch is turned to the ON position.</li><li>• The security light remains illuminated while the ignition switch is at the LOCK position.</li><li>• The security light does not flash or the flashing interval is abnormal while the ignition switch is at the LOCK position.</li></ul>

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NO.1 SECURITY LIGHT DISPLAY IS NOT NORMAL [IMMOBILIZER SYSTEM]

1	The security light display is not normal.
DESCRIPTION	<ul style="list-style-type: none"><li>• The security light remains illuminated 2 min or more after the ignition switch is turned to the ON position.</li><li>• The security does not illuminate when the ignition switch is turned to the ON position.</li><li>• The security light remains illuminated while the ignition switch is at the LOCK position.</li><li>• The security light does not flash or the flashing interval is abnormal while the ignition switch is at the LOCK position.</li></ul>
POSSIBLE CAUSE	<div><div><ul style="list-style-type: none"><li>• Advanced keyless control module malfunction (with advanced keyless control system)</li><li>• Instrument cluster malfunction</li></ul></div><div>NOTE:<ul style="list-style-type: none"><li>• If the security light remains illuminated for approx. 1 min after the ignition switch is turned to the ON position and then displays a DTC, perform immobilizer system malfunction diagnosis according to that DTC. (See <a href="#">DTC TABLE [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]</a>.) (See <a href="#">DTC TABLE [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]</a>.)</li><li>• While performing immobilizer system security access using the M-MDS, the security light does not illuminate even if the ignition switch is turned to the ON position. Verify the illumination condition of the security light by disconnecting the DLC-2 to release security access.</li></ul></div></div> <div><div>NOTE: SECURITY LIGHT FLASHING SEQUENCE WHEN IGNITION SWITCH IS TURNED TO LOCK POSITION (IMMOBILIZER SYSTEM IS NORMAL)</div><div><div>ILLUMINATED</div><div>GOES OUT</div><div><p>APPROX. 1.9 S   APPROX. 1.9 S</p><p>APPROX. 0.1 S</p></div></div></div>

## Diagnostic Procedure

STEP	INSPECTION	ACTION	
1	<ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position.</li> <li>Verify that the other warning lights in the instrument cluster condition.</li> <li>Do the warning lights illumination normal?</li> </ul>	Yes	Go to the next step.
		No	Inspect the power and GND circuit for the instrument cluster. If the circuits are normal, replace the instrument cluster.  (See <a href="#">INSTRUMENT CLUSTER INSPECTION.</a> )
2	<ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position.</li> <li>Verify that the security light illumination.</li> <li>Does the security light remains illuminate above 2 min?</li> </ul>	Yes	Replace the instrument cluster.  (See <a href="#">INSTRUMENT CLUSTER REMOVAL/INSTALLATION.</a> )
		No	Go to the next step.
3	<ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position.</li> <li>Verify that the security light illumination.</li> <li>Does the security light remain illumination?</li> </ul>	Yes	Replace the instrument cluster.  (See <a href="#">INSTRUMENT CLUSTER REMOVAL/INSTALLATION.</a> )
		No	Go to the next step.
4	<ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Verify that the security light is flashing.</li> <li>Does the security light flash normally?</li> </ul>	Yes	Go to the next step.
		No	If the security light flashes with DTC patterns, perform the applicable DTC troubleshooting procedure.  (See <a href="#">DTC TABLE [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]</a> .)  (See <a href="#">DTC TABLE [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]</a> .)  If the security light does not flash, replace the instrument cluster.  (See <a href="#">INSTRUMENT CLUSTER REMOVAL/INSTALLATION.</a> )
5	<ul style="list-style-type: none"> <li>Is the advanced keyless entry system equipped?</li> </ul>	Yes	Go to the next step.
		No	Replace the instrument cluster.

			(See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION</b> .)
6	<ul style="list-style-type: none"><li>• Disconnect the battery negative post.</li><li>• Disconnect the advanced keyless control module connectors.</li><li>• Connect the battery negative post.</li><li>• Turn the ignition switch to the ON position.</li><li>• Verify that the security light illumination.</li><li>• Does the security light illuminate normally?</li></ul>	Yes	Replace the instrument cluster.  (See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION</b> .)
		No	Replace the advanced keyless control module.  (See <b>KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</b> .)

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## 2008 - MX-5 - Body and Accessories

### SYMPTOM TROUBLESHOOTING CHART [EXTERIOR OPEN FUNCTION]

No.	TROUBLESHOOTING ITEM
1	No.1 DOOR GLASS DOES NOT OPERATE EVEN THOUGH VARIOUS OPERATIONS ARE PERFORMED[EXTERIOR OPEN FUNCTION]
2	No.2 DOOR GLASS DOES NOT OPERATE USING THE KEYLESS TRANSMITTER[EXTERIOR OPEN FUNCTION]
3	No.3 SOME DOOR GLASS DO NOT OPERATE [EXTERIOR OPEN FUNCTION]
4	No.4 DOOR GLASS STOPS BEFORE FULLY OPENING [EXTERIOR OPEN FUNCTION]
5	No.5 ALL DOOR GLASSES OPERATE ACCIDENTALLY [EXTERIOR OPEN FUNCTION]

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**2008 - MX-5 - Body and Accessories**

**QUICK DIAGNOSTIC CHART [EXTERIOR OPEN FUNCTION]**



X: Applied

<div> <div>Possible factor</div> <div>Troubleshooting item</div> </div>	1	2	3	4	5
	Door glass does not operate even though various operations are performed	Door glass does not operate using the keyless transmitter	Some door glass do not operate	Door glass stops before fully opening	All door glasses operate accidentally
Power window main switch malfunction	X		X	X	X
Power window motor malfunction	X		X	X	
Battery malfunction (low voltage)	X		X	X	
Open circuit in wiring harness between power window main switch and keyless control module	X				
keyless control module malfunction		X			
Open circuit in wiring harness between keyless receiver and keyless control module		X			
Any door or trunk lid is open.		X			
Key is inserted in steering lock.		X			
Open circuit in wiring harness between request switch and keyless control module.					X
Start knob is in a position other than LOCK position.					
Improper installation of door glass				X	
Keyless entry system signal reception error (outside operation area, radio signal interference)				X	
Transmitter malfunction					X
Request switch malfunction					X

**NOTE:**

- The exterior open function does not operate when the following conditions are met.
  - Any door or trunk lid is open.

- The key is inserted in the steering lock.
- The start knob is not in the LOCK position.
- The auto-open/close function (the exterior open function) does not operate if the power window system initial setting procedure has been reset.
- Depending on the temperature and battery conditions, the window may reverse on rare occasions.

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### No.2 DOOR GLASS DOES NOT OPERATE USING THE KEYLESS TRANSMITTER [EXTERIOR OPEN FUNCTION]

2	DOOR GLASS DOES NOT OPERATE USING THE KEYLESS TRANSMITTER
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>• Keyless control module malfunction</li> <li>• Open circuit in wiring harness between keyless control module and keyless receiver</li> <li>• Any door or trunk lid is open.</li> <li>• Key is inserted in steering lock.</li> </ul>

#### Diagnostic Procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>• Inspect the door lock/unlock operation using the transmitter.</li> <li>• Does it operate normally?</li> </ul>	Yes Inspect the keyless control module, and repair or replace.  (See <a href="#">KEYLESS CONTROL MODULE INSPECTION[ADVANCED KEYLESS SYSTEM]</a> .)  (See <a href="#">KEYLESS CONTROL MODULE INSPECTION[KEYLESS ENTRY SYSTEM]</a> .)
		No Go to the next step.
2	<ul style="list-style-type: none"> <li>• Inspect the open/close condition of the doors and the trunk lid.</li> <li>• Is the reason why they do not lock/unlock because a door or the trunk lid is open?</li> </ul>	Yes System is normal (Does not operate when a door or the trunk lid is open).
		No Go to the next step.
3	<ul style="list-style-type: none"> <li>• Verify whether the key is in the steering lock.</li> <li>• Is the reason why they do not lock/unlock because the key is inserted in the steering lock?</li> </ul>	Yes System is normal (Does not operate when the key is inserted in the steering wheel lock)
		No Go to the next step.

4	<ul style="list-style-type: none"><li>When the lock/unlock operation does not operate for reasons other than the above steps 2 and 3.</li></ul>	Yes	<p>Inspect the following parts, and repair or replace.</p> <ul style="list-style-type: none"><li>Keyless control module</li></ul> <p>(See <b>KEYLESS CONTROL MODULE INSPECTION[ADVANCED KEYLESS SYSTEM]</b>.)</p> <p>(See <b>KEYLESS CONTROL MODULE INSPECTION[KEYLESS ENTRY SYSTEM]</b>.)</p> <ul style="list-style-type: none"><li>Wiring harness between keyless control module and keyless receiver.</li></ul>
		No	<p>Reinspect for malfunction recurrence. If the malfunction is not corrected, repeat the procedure from step 1.</p>

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### No.1 DOOR GLASS DOES NOT OPERATE EVEN THOUGH VARIOUS OPERATIONS ARE PERFORMED [EXTERIOR OPEN FUNCTION]

1	Door glass does not operate even though various operations are performed
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>• Power window main switch malfunction</li> <li>• Power window motor malfunction</li> <li>• Battery malfunction (low voltage)</li> <li>• Power window system initial setting error</li> <li>• Open circuit in wiring harness between power window main switch and keyless control module</li> <li>• Keyless control module malfunction</li> </ul>

### Diagnostic Procedure

STEP	INSPECTION		ACTION
1	<ul style="list-style-type: none"> <li>• Inspect the operation of the door glass by operating the power window main switch.</li> <li>• Is the manual operation normal?</li> </ul>	Yes	Go to the next step.
		No	Inspect the following parts, and repair or replace. <ul style="list-style-type: none"> <li>• Power window main switch (See <a href="#">POWER WINDOW MAIN SWITCH INSPECTION.</a>) (See <a href="#">POWER WINDOW MAIN SWITCH INSPECTION[POWER RETRACTABLE HARDTOP].</a>)</li> <li>• Power window motor (See <a href="#">POWER WINDOW MOTOR INSPECTION.</a>)</li> <li>• Battery (Low voltage)</li> </ul>
2	<ul style="list-style-type: none"> <li>• Inspect the operation of the door glass by operating the power</li> </ul>	Yes	Go to the next step.

	<p>window main switch.</p> <ul style="list-style-type: none"><li>Does the door glass operate in auto?</li></ul>	No	<p>Inspect the power window main switch, and repair or replace.</p> <p>(See <b>POWER WINDOW MAIN SWITCH INSPECTION</b>.)</p> <p>(See <b>POWER WINDOW MAIN SWITCH INSPECTION[POWER RETRACTABLE HARDTOP]</b>.)</p>
3	<ul style="list-style-type: none"><li>Does the door lock/unlock normally?</li></ul>	Yes	<p>Inspect the wiring harness between the power window main switch and the keyless control module.</p> <p>If there is any malfunction, repair or replace the applicable part.</p>
		No	<p>Replace the keyless control module.</p> <p>(See <b>KEYLESS CONTROL MODULE REMOVAL/INSTALLATION[ADVANCED KEYLESS SYSTEM]</b>.)</p> <p>(See <b>KEYLESS CONTROL MODULE REMOVAL/INSTALLATION[KEYLESS ENTRY SYSTEM]</b>)</p>

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### No.3 SOME DOOR GLASS DO NOT OPERATE [EXTERIOR OPEN FUNCTION]

<b>4</b>	Some door glass do not operate
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Power window main switch malfunction</li> <li>• Power window motor malfunction</li> <li>• Battery malfunction (low voltage)</li> </ul>

#### Diagnostic Procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>• Inspect the door glass operation by operating the power window main switch.</li> <li>• Does it operate normally?</li> </ul>	Yes Perfrom the "Auto Open Function Inspection". (See <a href="#">POWER WINDOW SYSTEM PRELIMINARY INSPECTION[POWER WINDOW SYSTEM].</a> )
		No Inspect the following parts, and repair or replace. <ul style="list-style-type: none"> <li>• Power window main switch (See <a href="#">POWER WINDOW MAIN SWITCH INSPECTION.</a>) (See <a href="#">POWER WINDOW MAIN SWITCH INSPECTION[POWER RETRACTABLE HARDTOP].</a>)</li> <li>• Power window motor (See <a href="#">POWER WINDOW MOTOR INSPECTION.</a>)</li> <li>• Battery (Low voltage)</li> </ul>

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### No.4 DOOR GLASS STOPS BEFORE FULLY OPENING [EXTERIOR OPEN FUNCTION]

5	DOOR GLASS STOPS BEFORE FULLY OPENING/
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>• Power window main switch malfunction</li> <li>• Power window motor malfunction</li> <li>• Battery malfunction (Low voltage)</li> <li>• Door glass improper installation</li> <li>• Keyless entry system signal reception error (outside operation area, radio signal interference)</li> </ul>

#### Diagnostic Procedure

STEP	INSPECTION		ACTION
1	<ul style="list-style-type: none"> <li>• Operate the door glass in auto/manual by operating the power window main switch.</li> <li>• Does the door glass stop before fully opening/closing using either operation?</li> </ul>	Yes	Inspect the following parts, and repair or replace. <ul style="list-style-type: none"> <li>• Power window main switch (See <b>POWER WINDOW MAIN SWITCH INSPECTION.</b>) (See <b>POWER WINDOW MAIN SWITCH INSPECTION[POWER RETRACTABLE HARDTOP].</b>)</li> <li>• Power window motor (See <b>POWER WINDOW MOTOR INSPECTION.</b>)</li> <li>• Battery (Low voltage)</li> <li>• Door glass (Installation condition)</li> </ul>
		No	Go to the next step.
2	<ul style="list-style-type: none"> <li>• Open the door glass by operating the transmitter.</li> <li>• Does the door glass stop before fully opening?</li> </ul>	Yes	Inspect the following parts, and repair or replace. <ul style="list-style-type: none"> <li>• Keyless control module (See <b>KEYLESS CONTROL MODULE INSPECTION[ADVANCED KEYLESS</b></li> </ul>



			<b>SYSTEM].)</b>  (See <b>KEYLESS CONTROL MODULE INSPECTION[KEYLESS ENTRY SYSTEM].)</b> <ul style="list-style-type: none"><li>• Keyless entry system signal reception error (outside operation area, radio signal interference.)</li></ul>
			No Reinspect for malfunction recurrence. If the malfunction is not corrected, repeat the procedure from step 1.

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### No.5 ALL DOOR GLASSES OPERATE ACCIDENTALLY [EXTERIOR OPEN FUNCTION]

6	All door glasses operate accidentally
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>• Transmitter malfunction</li> <li>• Request switch malfunction</li> <li>• Open or short circuit in wiring harness between request switch (each door) and keyless control module.</li> <li>• Power window main switch malfunction</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>• Inspect if malfunction is in operating by transmitter</li> </ul>	Yes Inspect the transmitter.
		No Go to the next step.
2	<ul style="list-style-type: none"> <li>• Inspect if malfunction is in operating by request switch</li> </ul>	Yes Inspect the following parts and repair or replace. <ul style="list-style-type: none"> <li>• Request switch (See <b>REQUEST SWITCH INSPECTION[ADVANCED KEYLESS SYSTEM]</b>.)</li> <li>• Wiring harness between request switch and keyless control module</li> </ul>
		No Go to the next step.
3	<ul style="list-style-type: none"> <li>• Inspect if malfunction is in operating power window main switch</li> </ul>	Yes Inspect power window main switch. (See <b>POWER WINDOW MAIN SWITCH INSPECTION.</b> ) (See <b>POWER WINDOW MAIN SWITCH INSPECTION[POWER RETRACTABLE HARDTOP]</b> .)
		No Go to the next step.

4	<ul style="list-style-type: none"><li>Inspect if malfunction is in without operating step 1 to 3</li></ul>	Yes	Inspect the keyless control module and repair or replace.  (See <b>KEYLESS CONTROL MODULE INSPECTION[ADVANCED KEYLESS SYSTEM].</b> )  (See <b>KEYLESS CONTROL MODULE INSPECTION[KEYLESS ENTRY SYSTEM].</b> )
		No	Reinspect for malfunction recurrence. If the malfunction is not corrected, repeat the procedure from step 1.

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### SYMPTOM TROUBLESHOOTING INDEX [POWER RETRACTABLE HARDTOP]

No.	TROUBLESHOOTING ITEM	DESCRIPTION
1	Power retractable hardtop warning buzzer sounds continuously	Power retractable hardtop warning buzzer sounds continuously while vehicle is stopped
2	Power retractable hardtop indicator light flashing	Power retractable hardtop indicator light flashes when power retractable hardtop is stopped
3	Power retractable hardtop does not start to open	Power retractable hardtop does not start to open when power retractable hardtop (open) switch is pressed
4	Power retractable hardtop does not start to close	Power retractable hardtop does not start to close when power retractable hardtop (close) switch is pressed
5	Power retractable hardtop stops while operating	Power retractable hardtop stops while power retractable hardtop is opening/closing

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### NO. 1 POWER RETRACTABLE HARDTOP WARNING BUZZER SOUNDS CONTINUOUSLY [POWER RETRACTABLE HARDTOP]

1	Power retractable hardtop warning buzzer sounds continuously
<b>DESCRIPTION</b>	<ul style="list-style-type: none"> <li>Power retractable hardtop warning buzzer sounding continuously while the vehicle is stopped.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Power retractable hardtop control module sends an buzzer operation signal to the instrument cluster. <ul style="list-style-type: none"> <li>Power retractable hardtop control module malfunction</li> <li>Power retractable hardtop control module cannot detect the power retractable hardtop permission condition signal. <ul style="list-style-type: none"> <li>Vehicle speed detected</li> <li>Transmission position detected (except for transmission neutral (MT)/N or P position (AT) detected)</li> </ul> </li> </ul> </li> <li>Power retractable hardtop control module detects a system malfunction</li> <li>Instrument cluster malfunction (Buzzer sounds regardless of the instruction from the power retractable hardtop control module)</li> </ul>

#### Diagnostic Procedure

- When performing the asterisked (\*) troubleshooting inspection, slightly shake the wiring harness and connectors while performing the inspection to determine whether poor contact points are the cause of any intermittent malfunction. If there is a problem, verify that the connectors, terminals and wiring harness are connected correctly and undamaged.

STEP	INSPECTION	ACTION
1	<b>VERIFY THAT PRESENT DTC IS STORED</b> <ul style="list-style-type: none"> <li>Stop the vehicle.</li> <li>Shift to P or N position (AT)/neutral position (MT).</li> </ul>	<p>Yes Retrieve the DTC for the power retractable hardtop control module using the M-MDS.</p> <p>If the DTC is displayed, perform the appropriate troubleshooting procedure.</p>

	<ul style="list-style-type: none"><li>• Turn the ignition switch to the ON position.</li><li>• Verify that power retractable hardtop indicator light status.</li><li>• Is the power retractable hardtop indicator light flashing?</li></ul>		Then go to the next step.
		No	Go to the next step.
2	<b>VERIFY THAT POWER RETRACTABLE HARDTOP INDICATOR LIGHT ILLUMINATES</b> <ul style="list-style-type: none"><li>• Turn the ignition switch to ON position.</li><li>• Verify the power retractable hardtop indicator light status.</li><li>• Does the power retractable hardtop indicator light illuminate?</li></ul>	Yes	Fully open/close the roof and lock the top lock (if the roof is fully closed).  Verify the power retractable hardtop indicator light status again.  If the indicator light illuminates with the power retractable hardtop fully open, return to step 1.  If the indicator light illuminates with the power retractable hardtop fully closed, inspect the top lock switch.  If the indicator light does not illuminate go to the next step.
		No	Go to the next step.
3	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN OPERATION PERMISSION CONDITION SIGNAL OR ELSEWHERE</b> <ul style="list-style-type: none"><li>• Connect the M-MDS to the DLC-2.</li><li>• Monitor the following PIDs. (See <a href="#">PCM INSPECTION[LF]</a>.) (See <a href="#">PID/DATA MONITOR INSPECTION[SJ6A-EL]</a>.) (See <a href="#">POWER RETRACTABLE HARDTOP CONTROL MODULE INSPECTION</a>.)  <b>PCM</b><ul style="list-style-type: none"><li>▪ VSS</li><li>▪ PNP/CP (MT)</li><li>▪ CP (MT)</li></ul><b>TCM (AT)</b><ul style="list-style-type: none"><li>▪ TR</li></ul> <b>Power Retractable Hardtop Control Module</b></li></ul>	Yes	Go to the next step.
		No	Inspect and repair the suspected signal related wiring harness and component.

	VSS		
	<ul style="list-style-type: none"> <li>Are these monitor values normal?</li> </ul>		
4*	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN INSTRUMENT CLUSTER (BUZZER) OR POWER RETRACTABLE HARDTOP CONTROL MODULE</b> <ul style="list-style-type: none"> <li>Perform the INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE. (See <b>INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.</b>)</li> <li>Does the buzzer sound with check code 14?</li> </ul>	Yes	Replace the power retractable hardtop control module.  (See <b>POWER RETRACTABLE HARDTOP CONTROL MODULE REMOVAL/INSTALLATION.</b> )
		No	Replace the instrument cluster.  (See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION.</b> )  (See <b>INSTRUMENT CLUSTER DISASSEMBLY/ASSEMBLY.</b> )

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### NO. 2 POWER RETRACTABLE HARDTOP INDICATOR LIGHT FLASHING [POWER RETRACTABLE HARDTOP]

2	Power retractable hardtop indicator light flashing
<b>DESCRIPTION</b>	<ul style="list-style-type: none"> <li>Power retractable hardtop indicator light flashes when the power retractable hardtop is stopped.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Locking of the top lock is unstable when it is fully closed. (Locks and unlocks repeatedly) <ul style="list-style-type: none"> <li>Top lock switch malfunction</li> <li>Open or short circuit in the wiring harness between the top lock switch and the power retractable hardtop control module</li> </ul> </li> <li>Power retractable hardtop control module cannot control the power retractable hardtop indicator light operation. <ul style="list-style-type: none"> <li>Power retractable hardtop control module malfunction</li> <li>Short to ground in the wiring harness between power retractable hardtop control module and the power retractable hardtop indicator light.</li> </ul> </li> <li>Power retractable hardtop control module detects a system malfunction.</li> </ul>

#### Diagnostic Procedure

- When performing the asterisked (\*) troubleshooting inspection, slightly shake the wiring harness and connectors while performing the inspection to determine whether poor contact points are the cause of any intermittent malfunction. If there is a problem, verify that the connectors, terminals and the wiring harness are connected correctly and undamaged.

STEP	INSPECTION	ACTION
1	<b>VERIFY THAT PRESENT DTC IS STORED</b> <ul style="list-style-type: none"> <li>Connect the M-MDS to DLC-2.</li> <li>Retrieve the DTC for the power retractable hardtop control module</li> </ul>	YesGo to the appropriate DTC inspection. (See <b>DTC TABLE [POWER RETRACTABLE HARDTOP]</b> .)



	<ul style="list-style-type: none"> <li>Is there a DTC present?</li> </ul>	No	Go to the next step.
2	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN TOP LOCK SWITCH OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>Verify the power retractable hardtop status.</li> <li>Is the power retractable hardtop fully closed?</li> </ul>	Yes	Go to the next step.
		No	Go to step 4.
3	<b>INSPECT TOP LOCK SWITCH</b> <ul style="list-style-type: none"> <li>Inspect the top lock switch. (See <a href="#">TOP LOCK SWITCH INSPECTION [ADVANCED KEYLESS SYSTEM]</a>.)</li> <li>Is the top lock switch normal?</li> </ul>	Yes	Inspect and repair for an open or short circuit in the wiring harness between the top lock switch and power retractable hardtop control module.
		No	Replace the top lock.  (See <a href="#">FRONT ROOF PANEL DISASSEMBLY/ASSEMBLY</a> .)
4*	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN POWER RETRACTABLE HARDTOP INDICATOR LIGHT CONTROL CIRCUIT OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the power retractable hardtop control module (6-pin) and power retractable hardtop switch connectors.</li> <li>Verify the continuity between the power retractable hardtop control module terminal 2C and ground.</li> <li>Is there continuity?</li> </ul>	Yes	Replace for a short to the ground circuit.
		No	Go to the next step.
5	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN POWER RETRACTABLE HARDTOP INDICATOR LIGHT OR POWER RETRACTABLE HARDTOP CONTROL MODULE</b> <ul style="list-style-type: none"> <li>Reinspect malfunction condition. Does the power retractable hardtop indicator light flash?</li> </ul>	Yes	Replace the power retractable hardtop control module.  (See <a href="#">POWER RETRACTABLE HARDTOP CONTROL MODULE REMOVAL/INSTALLATION</a> .)
		No	Replace the power retractable hardtop switch.  (See <a href="#">POWER RETRACTABLE HARDTOP SWITCH REMOVAL/INSTALLATION</a> .)



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### NO. 3 POWER RETRACTABLE HARDTOP DOES NOT START TO OPEN [POWER RETRACTABLE HARDTOP]

3	Power retractable hardtop does not to start open
<b>DESCRIPTION</b>	<ul style="list-style-type: none"> <li>Power retractable hardtop does not start to open when the power retractable hardtop (open) switch is pressed</li> </ul>
	<ul style="list-style-type: none"> <li>Power retractable hardtop control module cannot detect the power retractable hardtop permission condition signal. <ul style="list-style-type: none"> <li>Improper vehicle speed detected</li> <li>Improper transmission position detected (except for transmission neutral (MT)/N or P position (AT) detected)</li> </ul> </li> <li>Power retractable hardtop control module cannot detect the proper power retractable hardtop switch signal. <ul style="list-style-type: none"> <li>Power retractable hardtop (open) switch malfunction (stuck off)</li> <li>Power retractable hardtop (close) switch malfunction (stuck on)</li> <li>Open or short circuit in the wiring harness between the power retractable hardtop control module and the power retractable hardtop switch.</li> </ul> </li> <li>Release of the top lock cannot be determined by the Power retractable hardtop control module. <ul style="list-style-type: none"> <li>Top lock switch malfunction</li> <li>Open or short circuit in the wiring harness between the top lock switch and the power retractable hardtop control module</li> </ul> </li> <li>Power retractable hardtop control module cannot detect proper deck panel and roof positions <ul style="list-style-type: none"> <li>Deck panel open position switch signal improper <ul style="list-style-type: none"> <li>Deck panel open position switch malfunction</li> <li>Deck panel open position switch improper installation</li> </ul> </li> </ul> </li> </ul>

**POSSIBLE  
CAUSE**

- Open or short circuit in the wiring harness
- Deck panel close position switch signal malfunction
  - Deck panel close position switch malfunction
  - Deck panel close position switch improper installation
  - Open or short circuit in the wiring harness
- Power retractable hardtop open position switch signal malfunction
  - Power retractable hardtop open position switch malfunction
  - Power retractable hardtop open position switch improper installation
  - Open or short circuit in the wiring harness
- Power retractable hardtop close position switch signal malfunction
  - Power retractable hardtop close position switch malfunction
  - Power retractable hardtop close position switch improper installation
  - Open or short circuit in the wiring harness
- Power retractable hardtop link mechanics malfunction
  - Excessive restriction or hesitation
- Power retractable hardtop control module detects a system malfunction

**NOTE:**

- If the following conditions are recognized, the power retractable hardtop control module invalidates the operation of the power retractable hardtop (open) switch.
  - Top lock is locked with the power retractable hardtop fully closed
  - Power retractable hardtop the fully open

**Diagnostic Procedure**

- When performing the asterisked (\*) troubleshooting inspection, slightly shake the wiring harness and connectors while performing the inspection to determine whether poor contact

points are the cause of any intermittent malfunction. If there is a problem, verify that the connectors, terminals and the wiring harness are connected correctly and undamaged.

STEP	INSPECTION	ACTION
1	<p><b>INSPECT TO SEE WHETHER MALFUNCTION IS IN OPERATION PERMISSION CONDITION SIGNAL OR ELSEWHERE</b></p> <ul style="list-style-type: none"> <li>• Connect the M-MDS to the DLC-2.</li> <li>• Monitor the following PIDs. (See <a href="#">PCM INSPECTION [LF].</a>) (See <a href="#">PID/DATA MONITOR INSPECTION [SJ6A-EL].</a>) (See <a href="#">POWER RETRACTABLE HARDTOP CONTROL MODULE INSPECTION.</a>)</li> </ul> <p style="text-align: center;"><b>PCM</b></p> <ul style="list-style-type: none"> <li>▪ VSS</li> <li>▪ PNP/CP (MT)</li> <li>▪ CP (MT)</li> </ul> <p style="text-align: center;"><b>TCM (AT)</b></p> <ul style="list-style-type: none"> <li>▪ TR</li> </ul> <p style="text-align: center;"><b>Power Retractable Hardtop Control Module</b></p> <ul style="list-style-type: none"> <li>▪ VSS</li> </ul> <ul style="list-style-type: none"> <li>• Are these monitor values normal?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Inspect and repair the suspected signal related wiring harness and component.</p>
2*	<p><b>INSPECT TO SEE WHETHER MALFUNCTION IS IN POWER RETRACTABLE HARDTOP (CLOSE) SWITCH SIGNAL OR ELSEWHERE</b></p> <ul style="list-style-type: none"> <li>• Monitor the power retractable hardtop control module PID SW_CL (power retractable hardtop (close) switch) using the M-MDS without the power retractable hardtop (close) switch pressed. (See <a href="#">POWER RETRACTABLE HARDTOP CONTROL MODULE INSPECTION.</a>)</li> </ul>	<p>Yes Go to step 4.</p> <p>No Go to the next step.</p>

	Is the monitor value OFF?		
3	<b>INSPECT POWER RETRACTABLE HARDTOP (CLOSE) SWITCH</b> <ul style="list-style-type: none"><li>• Turn the ignition switch to the LOCK position.</li><li>• Remove the power retractable hardtop switch.</li><li>• Measure the resistance between power retractable hardtop switch component side connector terminals A and F without the power retractable hardtop (close) switch pressed.</li><li>• Is the resistance <b>2.18—2.22 kΩ</b>?</li></ul>	Yes	Replace the power retractable hardtop switch.  (See <b>POWER RETRACTABLE HARDTOP SWITCH REMOVAL/INSTALLATION.</b> )
		No	Inspect and repair the wiring harness between power retractable hardtop control module terminal 1H and power retractable hardtop switch terminal F at wiring harness side connectors.
4	<b>VERIFY THAT POWER RETRACTABLE HARDTOP INDICATOR LIGHT ILLUMINATION</b> <ul style="list-style-type: none"><li>• Turn the ignition switch to the ON position.</li><li>• Verify the power retractable hardtop indicator light status.</li><li>• Does the power retractable hardtop indicator light flash or illuminate?</li></ul>	Yes	<b>If the indicator light is flashing:</b> <ul style="list-style-type: none"><li>• Go to the next step.</li></ul> <b>If the indicator light is illuminated:</b> <ul style="list-style-type: none"><li>• Go to step 6.</li></ul>
		No	Go to step 9.
5	<b>VERIFY THAT PRESENT MALFUNCTION DTC IS STORED</b> <ul style="list-style-type: none"><li>• Connect the M-MDS to DLC-2.</li><li>• Retrieve the DTC for the power retractable hardtop control module.  (See <b>DTC INSPECTION [POWER RETRACTABLE HARDTOP].</b>)</li><li>• Is there any present malfunction DTC?</li></ul>	Yes	Go to the appropriate DTC inspection.  (See <b>DTC TABLE [POWER RETRACTABLE HARDTOP].</b> )
		No	Go to symptom troubleshooting “No.2 POWER RETRACTABLE HARDTOP INDICATOR LIGHT IS FLASHING” procedure.
6*	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN TOP LOCK SWITCH OR ELSEWHERE</b> <ul style="list-style-type: none"><li>• Connect the M-MDS to DLC-2.</li><li>• Monitor the power retractable hardtop control module PID SW_STRIKER using the M-MDS while the top lock switch is released.  (See <b>DTC INSPECTION [POWER RETRACTABLE HARDTOP].</b>)</li><li>• Is the monitor value OFF?</li></ul>	Yes	Go to step 8.
		No	Go to the next step.

7	<b>INSPECT TOP LOCK SWITCH</b> <ul style="list-style-type: none"> <li>Inspect the top lock switch.</li> </ul> <p>(See <a href="#">TOP LOCK SWITCH INSPECTION [ADVANCED KEYLESS SYSTEM]</a>.)</p> <ul style="list-style-type: none"> <li>Is the top lock switch normal?</li> </ul>	<div>Yes Inspect and repair for an open or short circuit between the top lock switch and power retractable hardtop control module.</div> <div>No Replace the top lock.</div> <p>(See <a href="#">FRONT ROOF PANEL DISASSEMBLY/ASSEMBLY</a>.)</p>
8*	<b>INSPECT POWER RETRACTABLE HARDTOP LIMIT SWITCH AND DECK PANEL LIMIT SWITCH</b> <ul style="list-style-type: none"> <li>Monitor the power retractable hardtop control module PID RHT_OP, RHT_CL, DECK_OP and DECK_CL using the M-MDS.</li> <li>Do the monitoring values indicate the roof and deck panel positions properly?</li> </ul>	<div>Yes Verify that the malfunction symptom appears without the roof and deck panel in the fully open position.</div> <p>If the same symptom appears, replace the power retractable hardtop control module.</p> <p>(See <a href="#">POWER RETRACTABLE HARDTOP REMOVAL/INSTALLATION</a>.)</p> <div>No Inspect and repair suspected position sensor.</div> <p>(See <a href="#">POWER RETRACTABLE HARDTOP LIMIT SWITCH INSPECTION</a>.)</p> <p>(See <a href="#">DECK PANEL LIMIT SWITCH INSPECTION</a>.)</p>
9*	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN POWER RETRACTABLE HARDTOP (OPEN) SWITCH SIGNAL OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>Monitor the power retractable hardtop control module PID SW_OP using the M-MDS while the power retractable hardtop (open) switch is pressed.</li> <li>Is the monitor value ON?</li> </ul>	<div>Yes Go to step 10.</div> <div>No Go to the next step.</div>
10	<b>INSPECT POWER RETRACTABLE HARDTOP (OPEN) SWITCH</b> <ul style="list-style-type: none"> <li>Remove the power retractable hardtop switch.</li> <li>Measure the resistance between power retractable hardtop switch connector (component side) terminal A and F while the power retractable hardtop (open) switch is pressed.</li> <li>Is the resistance <b>0.99—1.01 kΩ</b>?</li> </ul>	<div>Yes Inspect and repair the wiring harness between power retractable hardtop control module terminal 1H and power retractable hardtop switch terminal F at the wiring harness side connectors.</div> <div>No Replace the power retractable hardtop switch.</div>
11	<b>INSPECT POWER RETRACTABLE HARDTOP LINK MECHANICS</b>	<div>Yes Repair or replace the malfunctioning part.</div>

	<ul style="list-style-type: none"><li>• Inspect the power retractable hardtop link mechanics.</li><li>• Is there any restriction or hesitation with power retractable hardtop operation?</li></ul>	No	Replace the power retractable hardtop control module.  (See <b>POWER RETRACTABLE HARDTOP CONTROL MODULE REMOVAL/INSTALLATION.</b> )
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### NO. 4 POWER RETRACTABLE HARDTOP DOES NOT START TO CLOSE [POWER RETRACTABLE HARDTOP]

4	Power retractable hardtop does not start to close
DESCRIPTION	<ul style="list-style-type: none"><li>• Power retractable hardtop does not start to close when the power retractable hardtop (close) switch is pressed</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Power retractable hardtop control module cannot detect the power retractable hardtop permission condition signal.<ul style="list-style-type: none"><li>▪ Improper vehicle speed detected</li><li>▪ Improper transmission position detected (except for transmission neutral (MT)/N or P position (AT) detected)</li></ul></li><li>• Power retractable hardtop control module cannot detect the proper power retractable hardtop switch signal.<ul style="list-style-type: none"><li>▪ Power retractable hardtop (open) switch malfunction (stuck on)</li><li>▪ Power retractable hardtop (close) switch malfunction (stuck off)</li><li>▪ Open or short circuit in the wiring between the power retractable hardtop control module and the power retractable hardtop switch</li></ul></li><li>• Power retractable hardtop control module cannot detect proper deck panel and roof positions<ul style="list-style-type: none"><li>▪ Deck panel open position switch signal improper<ul style="list-style-type: none"><li>• Deck panel open position switch malfunction</li><li>• Deck panel open position switch improper installation</li><li>• Open or short circuit in the wiring harness</li></ul></li><li>▪ Deck panel close position switch signal improper<ul style="list-style-type: none"><li>• Deck panel close position switch malfunction</li></ul></li></ul></li></ul>

	<ul style="list-style-type: none"> <li>• Deck panel close position switch improper installation</li> <li>• Open or short circuit in the wiring harness</li> </ul> <ul style="list-style-type: none"> <li>▪ Power retractable hardtop open position switch signal improper <ul style="list-style-type: none"> <li>• Power retractable hardtop open position switch malfunction</li> <li>• Power retractable hardtop open position switch improper installation</li> <li>• Open or short circuit in the wiring harness</li> </ul> </li> <li>▪ Power retractable hardtop close position switch signal improper <ul style="list-style-type: none"> <li>• Power retractable hardtop close position switch malfunction</li> <li>• Power retractable hardtop close position switch improper installation</li> <li>• Open or short circuit in the wiring harness</li> </ul> </li> </ul> <ul style="list-style-type: none"> <li>• Power retractable hardtop link mechanics malfunction <ul style="list-style-type: none"> <li>▪ Excessive restriction or hesitation</li> </ul> </li> <li>• Power retractable hardtop control module detects a system malfunction</li> </ul>
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### Diagnostic Procedure

- When performing the asterisked (\*) troubleshooting inspection, slightly shake the wiring harness and connectors while performing the inspection to determine whether poor contact points are the cause of any intermittent malfunction. If there is a problem, verify that the connectors, terminals and the wiring harness are connected correctly and undamaged.

STEP	INSPECTION	ACTION
1	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN OPERATION PERMISSION CONDITION SIGNAL OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>• Connect the M-MDS to the DLC-2.</li> <li>• Monitor the following PIDs. (See <a href="#">PCM INSPECTION[LF]</a>.) (See <a href="#">PID/DATA MONITOR INSPECTION[SJ6A-EL]</a>.)</li> </ul>	Yes Go to the next step.
		No Inspect and repair the suspected signal related wiring harness and component.

	<p>(See <b>POWER RETRACTABLE HARDTOP CONTROL MODULE INSPECTION</b>.)</p> <p><b>PCM</b></p> <ul style="list-style-type: none"> <li>▪ VSS</li> <li>▪ PNP/CP (MT)</li> <li>▪ CPP (MT)</li> </ul> <p><b>TCM (AT)</b></p> <ul style="list-style-type: none"> <li>▪ TR</li> </ul> <p><b>Power Retractable Hardtop Control Module</b></p> <ul style="list-style-type: none"> <li>▪ VSS</li> </ul> <ul style="list-style-type: none"> <li>• Are these monitor values normal?</li> </ul>		
2*	<p><b>INSPECT TO SEE WHETHER MALFUNCTION IS IN POWER RETRACTABLE HARDTOP (OPEN) SWITCH SIGNAL OR ELSEWHERE</b></p> <ul style="list-style-type: none"> <li>• Monitor the power retractable hardtop control module PID SW_OP using the M-MDS without the power retractable hardtop (open) switch pressed.</li> </ul> <p>(See <b>POWER RETRACTABLE HARDTOP CONTROL MODULE INSPECTION</b>.)</p> <ul style="list-style-type: none"> <li>• Is the monitor value OFF?</li> </ul>	Yes	Go to step 4.
		No	Go to the next step.
3	<p><b>INSPECT POWER RETRACTABLE HARDTOP (OPEN) SWITCH</b></p> <ul style="list-style-type: none"> <li>• Remove the power retractable hardtop switch.</li> <li>• Measure the resistance between power retractable hardtop switch component side connector terminals A and F without the power retractable hardtop (open) switch pressed.</li> <li>• Is the resistance <b>0.99–1.01 kΩ</b>?</li> </ul>	Yes	<p>Replace the power retractable hardtop switch.</p> <p>(See <b>POWER RETRACTABLE HARDTOP SWITCH REMOVAL/INSTALLATION</b>.)</p>
		No	Inspect and repair the wiring harness between power retractable hardtop control module terminal 1H and power retractable hardtop switch terminal F at wiring harness side connectors.
4	<p><b>VERIFY THAT POWER RETRACTABLE HARDTOP INDICATOR LIGHT ILLUMINATES</b></p> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON</li> </ul>	Yes	<p><b>If the indicator light is flashing:</b></p> <ul style="list-style-type: none"> <li>• Go to the next step.</li> </ul>

	<p>position.</p> <ul style="list-style-type: none"> <li>• Verify the power retractable hardtop indicator light status.</li> <li>• Does the power retractable hardtop indicator light flash or illuminate?</li> </ul>		<p><b>If the indicator light is illuminated:</b></p> <ul style="list-style-type: none"> <li>• Go to step 6.</li> </ul>
		No	Go to step 7.
5	<p><b>VERIFY THAT PRESENT MALFUNCTION DTC IS STORED</b></p> <ul style="list-style-type: none"> <li>• Connect the M-MDS to DLC-2.</li> <li>• Retrieve the DTC for the power retractable hardtop control module.</li> </ul> <p>(See <b>DTC INSPECTION [POWER RETRACTABLE HARDTOP]</b>.)</p> <ul style="list-style-type: none"> <li>• Is there any present malfunction DTC?</li> </ul>	Yes	Go to the appropriate DTC inspection.
		No	Go to symptom troubleshooting "No.2 POWER RETRACTABLE HARDTOP INDICATOR LIGHT IS FLASHING" procedure.
6*	<p><b>INSPECT POWER RETRACTABLE HARDTOP LIMIT SWITCH</b></p> <ul style="list-style-type: none"> <li>• Connect the M-MDS to DLC-2.</li> <li>• Monitor the power retractable hardtop control module PID RHT_OP, RHT_CL, DECK_OP and DECK_CL using the M-MDS.</li> <li>• Do the monitoring values indicate the roof and deck panel positions properly?</li> </ul>	Yes	<p>Verify that the malfunction symptom appears without the roof and deck panel in the fully open position.</p> <p>If the same symptom appears, replace the power retractable hardtop control module.</p> <p>(See <b>POWER RETRACTABLE HARDTOP CONTROL MODULE REMOVAL/INSTALLATION</b>.)</p>
		No	<p>Inspect and repair the suspected position sensor.</p> <p>(See <b>POWER RETRACTABLE HARDTOP LIMIT SWITCH INSPECTION</b>.)</p> <p>(See <b>DECK PANEL LIMIT SWITCH INSPECTION</b>.)</p>
7*	<p><b>INSPECT TO SEE WHETHER MALFUNCTION IS IN POWER RETRACTABLE HARDTOP (CLOSE) SWITCH SIGNAL OR ELSEWHERE</b></p> <ul style="list-style-type: none"> <li>• Monitor the power retractable hardtop control module PID SW_CL using the M-MDS while the power retractable hardtop (close) switch is pressed.</li> <li>• Is the monitor value ON?</li> </ul>	Yes	Go to step 9.
		No	Go to the next step.
8	<p><b>INSPECT POWER RETRACTABLE HARDTOP (CLOSE) SWITCH</b></p> <ul style="list-style-type: none"> <li>• Remove the power retractable hardtop switch.</li> </ul>	Yes	Inspect and repair the wiring harness between power retractable hardtop control module terminal 1H and power retractable hardtop switch terminal F at wiring harness side

	<ul style="list-style-type: none"> <li>Measure the resistance between the power retractable hardtop switch connector (component side) terminal A and F while the open is switch pressed.</li> <li>Is the resistance <b>2.18–2.22 kΩ</b>?</li> </ul>	connectors.
		No Replace the power retractable hardtop switch. (See <b>POWER RETRACTABLE HARDTOP SWITCH REMOVAL/INSTALLATION.</b> )
9	<b>INSPECT POWER RETRACTABLE HARDTOP LINK MECHANICS</b> <ul style="list-style-type: none"> <li>Inspect the power retractable hardtop link mechanics.</li> <li>Is there any restriction or hesitation with power retractable hardtop operation?</li> </ul>	Yes Repair or replace malfunctioning part.  No Replace the power retractable hardtop control module. (See <b>POWER RETRACTABLE HARDTOP CONTROL MODULE REMOVAL/INSTALLATION.</b> )

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## 2008 - MX-5 - Body and Accessories

### NO. 5 POWER RETRACTABLE HARDTOP STOPS WHILE OPERATING [POWER RETRACTABLE HARDTOP]

5	Power retractable hardtop stops while operating
DESCRIPTION	<ul style="list-style-type: none"><li>• Power retractable hardtop stops while the power retractable hardtop is opening/closing</li></ul>
	<ul style="list-style-type: none"><li>• Deck panel does not operate while power retractable hardtop is operating<ul style="list-style-type: none"><li>▪ Deck panel cannot move<ul style="list-style-type: none"><li>• Open or short circuit or poor connection in the wiring harness between the left/right deck panel motor and power retractable hardtop control module</li><li>• Left/right deck panel motor malfunction</li><li>• Deck panel link mechanics malfunction (excessive restriction or hesitation)</li></ul></li><li>▪ Deck panel position cannot be detected<ul style="list-style-type: none"><li>• Deck panel open position switch malfunction</li><li>• Deck panel close position switch malfunction</li><li>• Open or short circuit or poor connection in the wiring harness between the deck panel open position switch and the power retractable hardtop control module</li><li>• Open or short circuit or poor connection in wiring harness between deck panel close position switch and power retractable hardtop control module</li><li>• Foreign material caught in mechanism.</li></ul></li></ul></li><li>• Roof does not operate while the power retractable hardtop is operating<ul style="list-style-type: none"><li>▪ Roof cannot move<ul style="list-style-type: none"><li>• Open or short circuit or poor connection in the wiring harness between the</li></ul></li></ul></li></ul>

<p><b>POSSIBLE CAUSE</b></p>	<p>left/right roof motor and the power retractable hardtop control module</p> <ul style="list-style-type: none"> <li>• Left/right roof motor malfunction</li> <li>• Roof link mechanics malfunction (excessive restriction or hesitation)</li> <li>▪ Roof position cannot be detected <ul style="list-style-type: none"> <li>• Power retractable hardtop open position switch malfunction</li> <li>• Power retractable hardtop close position switch malfunction</li> <li>• Open or short circuit or poor connection in the wiring harness between the power retractable hardtop open position switch and the power retractable hardtop control module</li> <li>• Open or short circuit or poor connection in the wiring harness between the power retractable hardtop close position switch and the power retractable hardtop control module</li> <li>• Foreign material caught in mechanism.</li> </ul> </li> <li>• Power retractable hardtop switch signal is interrupted while the power retractable hardtop is operating <ul style="list-style-type: none"> <li>▪ Power retractable hardtop (open) switch malfunction (Contact point defective)</li> <li>▪ Power retractable hardtop (close) switch malfunction (Contact point defective)</li> <li>▪ Open or short circuit or poor connection in the wiring harness between the power retractable hardtop control module and the power retractable hardtop switch</li> </ul> </li> <li>• Power retractable hardtop control module detects a system malfunction</li> </ul>
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**Diagnostic Procedure**

- When performing the asterisked (\*) troubleshooting inspection, slightly shake the wiring harness and connectors while performing the inspection to determine whether poor contact points are the cause of any intermittent malfunction. If there is a problem, verify that the connectors, terminals and the wiring harness are connected correctly and undamaged.

STEP	INSPECTION	ACTION
1	<p><b>VERIFY THAT POWER RETRACTABLE HARDTOP INDICATOR LIGHT ILLUMINATES</b></p>	<p>YesGo to the next step.</p>

	<ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position.</li> <li>• Verify the power retractable hardtop indicator light status.</li> <li>• Does the power retractable hardtop indicator light flash?</li> </ul>	No	Go to step 3.
2	<b>VERIFY THAT PRESENT MALFUNCTION DTC STORED</b> <ul style="list-style-type: none"> <li>• Connect the M-MDS to DLC-2.</li> <li>• Retrieve DTC for power retractable hardtop control module.</li> </ul> <p>(See <b>DTC INSPECTION [POWER RETRACTABLE HARDTOP].</b>)</p> <ul style="list-style-type: none"> <li>• Is there a DTC present?</li> </ul>	Yes	Go to the appropriate DTC inspection.  (See <b>DTC TABLE [POWER RETRACTABLE HARDTOP].</b> )
		No	Go to symptom troubleshooting "No.2 POWER RETRACTABLE HARDTOP INDICATOR LIGHT IS FLASHING" procedure.
3	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN DECK PANEL OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>• Verify the malfunction symptom.</li> <li>• Does the deck panel operation stop during the open or close operation?</li> </ul>	Yes	<b>Stops during the deck panel open operation:</b> <ul style="list-style-type: none"> <li>• Go to the next step.</li> </ul> <b>Stops during the deck panel close operation:</b> <ul style="list-style-type: none"> <li>• Go to step 7.</li> </ul>
		No	Go to step 14.
4	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN DECK PANEL OPEN POSITION SWITCH OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>• Monitor the power retractable hardtop control module PID DECK_OP using the M-MDS at the position where the deck panel does not operate.</li> <li>• Is the monitor value ON (deck panel fully open)?</li> </ul>	Yes	Go to the next step.
		No	Go to step 10.
5	<b>INSPECT DECK PANEL OPEN POSITION SWITCH</b> <ul style="list-style-type: none"> <li>• Inspect the deck panel open position switch.</li> </ul> <p>(See <b>DECK PANEL LIMIT SWITCH INSPECTION.</b>)</p> <ul style="list-style-type: none"> <li>• Is the deck panel open position switch normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the deck panel limit switch.  (See <b>DECK PANEL LIMIT SWITCH REMOVAL/INSTALLATION.</b> )
6*	<b>INSPECT DECK PANEL OPEN POSITION SWITCH WIRING HARNESS</b>	Yes	Adjust the deck panel open position switch installation.



	<ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Disconnect the power retractable hardtop control module (16-pin) and the deck panel open position switch connectors.</li> <li>• Verify the continuity between power retractable hardtop control module terminal 3F and ground.</li> <li>• Is there continuity?</li> </ul>		No	Repair for a short to the ground circuit.
7	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN DECK PANEL CLOSE POSITION SWITCH OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>• Monitor the power retractable hardtop control module PID DECK_CL using the M-MDS when the position where the deck panel could not operate.</li> <li>• Is the monitor value ON (deck panel fully closed)?</li> </ul>	Yes	Go to the next step.	
		No	Go to step 10.	
8	<b>INSPECT DECK PANEL CLOSE POSITION SWITCH</b> <ul style="list-style-type: none"> <li>• Inspect the deck panel close position switch. (See <a href="#">DECK PANEL LIMIT SWITCH INSPECTION.</a>)</li> <li>• Is the deck panel close position switch normal?</li> </ul>	Yes	Go to the next step.	
		No	Replace the deck panel limit switch.  (See <a href="#">DECK PANEL LIMIT SWITCH REMOVAL/INSTALLATION.</a> )	
9*	<b>INSPECT DECK PANEL CLOSE POSITION SWITCH WIRING HARNESS</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Disconnect the power retractable hardtop control module (16-pin) and the deck panel close position switch connectors.</li> <li>• Verify that the continuity between the power retractable hardtop control module terminal 3F and ground.</li> <li>• Is there any continuity?</li> </ul>	Yes	Adjust the deck panel close position switch installation.	
		No	Repair for a short to the ground circuit.	
10*	<b>INSPECT DECK PANEL MOTOR WIRING HARNESS</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Disconnect the power retractable hardtop control module (16-pin, 24-pin), and deck panel motor (left, right)(6-pin) connectors on both sides.</li> <li>• Inspect for an open or short circuit and poor connection at the following terminals: <ul style="list-style-type: none"> <li>▪ Power retractable hardtop</li> </ul> </li> </ul>	Yes	Repair or replace malfunctioning part.	
		No	Go to the next step.	

	<p>control module terminal 3M— deck panel motor (right) terminal A</p> <ul style="list-style-type: none"> <li>▪ Power retractable hardtop control module terminal 3E— deck panel motor (right) terminal E</li> <li>▪ Power retractable hardtop control module terminal 1K— deck panel motor (right) terminal F</li> <li>▪ Power retractable hardtop control module terminal 3H— deck panel motor (left) terminal A</li> <li>▪ Power retractable hardtop control module terminal 3P— deck panel motor (left) terminal E</li> <li>▪ Power retractable hardtop control module terminal 1O— deck panel motor (left) terminal F</li> </ul> <ul style="list-style-type: none"> <li>• Is there an open or short circuit, or a poor connection?</li> </ul>		
11	<b>INSPECT DECK PANEL MOTOR</b> <ul style="list-style-type: none"> <li>• Inspect the deck panel motors on both sides.  (See <b>DECK PANEL MOTOR INSPECTION.</b>)</li> <li>• Are both deck panel motors normal?</li> </ul>	Yes	Go to the next step.
		No	Replace suspected deck panel motor.  (See <b>DECK PANEL MOTOR REMOVAL/INSTALLATION.</b> )
12	<b>INSPECT DECK PANEL MOTOR HALL SENSOR</b> <ul style="list-style-type: none"> <li>• Measure the pulse profiles for the following power retractable hardtop control module (24-pin) while the deck panel is operating using the oscilloscope.               <ul style="list-style-type: none"> <li>▪ Terminal 1K (right deck panel motor hall sensor)</li> <li>▪ Terminal 1O (left deck panel motor hall sensor)</li> </ul> </li> <li>• Is the pulse profile normal?  (See <b>POWER RETRACTABLE HARDTOP CONTROL MODULE INSPECTION.</b>)</li> </ul>	Yes	Go to the next step.
		No	Replace the suspected deck panel motor.  (See <b>DECK PANEL MOTOR REMOVAL/INSTALLATION.</b> )
	<b>INSPECT POWER RETRACTABLE HARDTOP LINK</b>		

13	<b>MECHANICS</b> <ul style="list-style-type: none"> <li>Inspect the power retractable hardtop link mechanics.</li> <li>Is there any restriction or hesitation for the power retractable hardtop operation?</li> </ul>	Yes	Repair or replace the malfunctioning part.
		No	Go to step 25.
14	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN ROOF OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>Verify that malfunction symptom.</li> <li>Does the roof operation stop during the open or close operation?</li> </ul>	Yes	<b>Stops during the roof open operation:</b> <ul style="list-style-type: none"> <li>Go to the next step.</li> </ul> <b>Stops during the roof close operation:</b> <ul style="list-style-type: none"> <li>Go to step 18.</li> </ul>
		No	Go to step 25.
15	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN POWER RETRACTABLE HARDTOP OPEN POSITION SWITCH OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>Monitor the power retractable hardtop control module PID RHT_OP using the M-MDS at the position where the roof does operate.</li> <li>Is the monitor value on (roof fully open)?</li> </ul>	Yes	Go to the next step.
		No	Go to step 22.
16	<b>INSPECT POWER RETRACTABLE HARDTOP OPEN POSITION SWITCH</b> <ul style="list-style-type: none"> <li>Inspect the power retractable hardtop open position switch. (See <b>POWER RETRACTABLE HARDTOP LIMIT SWITCH INSPECTION.</b>)</li> <li>Is the power retractable hardtop open position switch normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the power retractable hardtop limit switch.  (See <b>POWER RETRACTABLE HARDTOP LIMIT SWITCH REMOVAL/INSTALLATION.</b> )
17*	<b>INSPECT RETRACTABLE HARDTOP OPEN POSITION SWITCH WIRING HARNESS</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the power retractable hardtop control module (24-pin) and the power retractable hardtop open position switch connectors.</li> <li>Verify that continuity between power retractable hardtop control module terminal 1T—ground.</li> </ul>	Yes	Adjust the power retractable hardtop open position switch installation.
		No	Repair for a short to the ground circuit.

	<ul style="list-style-type: none"> <li>Is there continuity?</li> </ul>		
18	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN POWER RETRACTABLE HARDTOP CLOSE POSITION SWITCH OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>Monitor the power retractable hardtop control module PID RHT_CL using the M-MDS at the position where the roof could not operate.  (See <b>POWER RETRACTABLE HARDTOP CONTROL MODULE REMOVAL/INSTALLATION.</b>)</li> <li>Is the monitor value on (roof fully closed)?</li> </ul>	Yes	Go to the next step.
		No	Go to step 20.
19	<b>INSPECT POWER RETRACTABLE HARDTOP CLOSE POSITION SWITCH</b> <ul style="list-style-type: none"> <li>Inspect the power retractable hardtop close position switch.  (See <b>POWER RETRACTABLE HARDTOP LIMIT SWITCH INSPECTION.</b>)</li> <li>Is the power retractable hardtop close position switch normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the power retractable hardtop limit switch.  (See <b>POWER RETRACTABLE HARDTOP LIMIT SWITCH REMOVAL/INSTALLATION.</b> )
20*	<b>INSPECT POWER RETRACTABLE HARDTOP CLOSE POSITION SWITCH WIRING HARNESS</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the power retractable hardtop control module (24-pin) and the deck panel close position switch connectors.</li> <li>Verify that continuity between power retractable hardtop control module terminal 1F—ground.</li> <li>Is there any continuity?</li> </ul>	Yes	Adjust the power retractable hardtop close position switch installation position.
		No	Repair for a short to the ground circuit.
21*	<b>INSPECT ROOF MOTOR WIRING HARNESS</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the power retractable hardtop control module (16-pin, 24-pin), and the roof motor (left, right)(6-pin) connector on both sides.</li> <li>Inspect for the open or short circuit and poor connection at the following terminals:               <ul style="list-style-type: none"> <li>Power retractable hardtop control module terminal 3I—roof motor (right) terminal A</li> <li>Power retractable hardtop control module terminal 3A—roof motor (right) terminal E</li> </ul> </li> </ul>	Yes	Repair or replace the malfunctioning part.
		No	Go to the next step.

	<ul style="list-style-type: none"> <li>▪ Power retractable hardtop control module terminal 1I—roof motor (right) terminal D</li> <li>▪ Power retractable hardtop control module terminal 3C—roof motor (left) terminal A</li> <li>▪ Power retractable hardtop control module terminal 3L—roof motor (left) terminal E</li> <li>▪ Power retractable hardtop control module terminal 1M—roof motor (left) terminal D</li> </ul> <ul style="list-style-type: none"> <li>• Is there an open or short circuit, or a poor connection?</li> </ul>		
22	<b>INSPECT ROOF MOTOR</b> <ul style="list-style-type: none"> <li>• Inspect the both side roof motor hall sensors on both side. (See <b>ROOF MOTOR INSPECTION.</b>)</li> <li>• Are both roof motors normal?</li> </ul>	Yes Go to the next step.	No Replace the suspected roof motor. (See <b>ROOF MOTOR REMOVAL/INSTALLATION.</b> )
23	<b>INSPECT ROOF MOTOR HALL SENSOR</b> <ul style="list-style-type: none"> <li>• Measure the pulse profiles for the following power retractable hardtop control module (24-pin) while the roof is operating using the oscilloscope.             <ul style="list-style-type: none"> <li>▪ Terminal 1I (right side roof motor hall sensor)</li> <li>▪ Terminal 1M (left side roof motor hall sensor)</li> </ul> </li> <li>• Is the pulse profile normal? (See <b>POWER RETRACTABLE HARDTOP CONTROL MODULE INSPECTION.</b>)</li> </ul>	Yes Go to the next step.	No Replace the suspected roof motor. (See <b>ROOF MOTOR REMOVAL/INSTALLATION.</b> )
24	<b>INSPECT POWER RETRACTABLE HARDTOP LINK MECHANICS</b> <ul style="list-style-type: none"> <li>• Inspect the roof link mechanics.</li> <li>• Does the roof operation stop during open or close operation?</li> </ul>	Yes Repair or replace the malfunctioning part.	No Go to the next step.
25	<b>INSPECT POWER RETRACTABLE HARDTOP SWITCH</b> <ul style="list-style-type: none"> <li>• Remove the power retractable hardtop switch.</li> <li>• Measure the resistance between power retractable hardtop switch connector (component side) terminals A and F.</li> </ul>	Yes Go to the next step.	No Replace the power retractable hardtop switch.

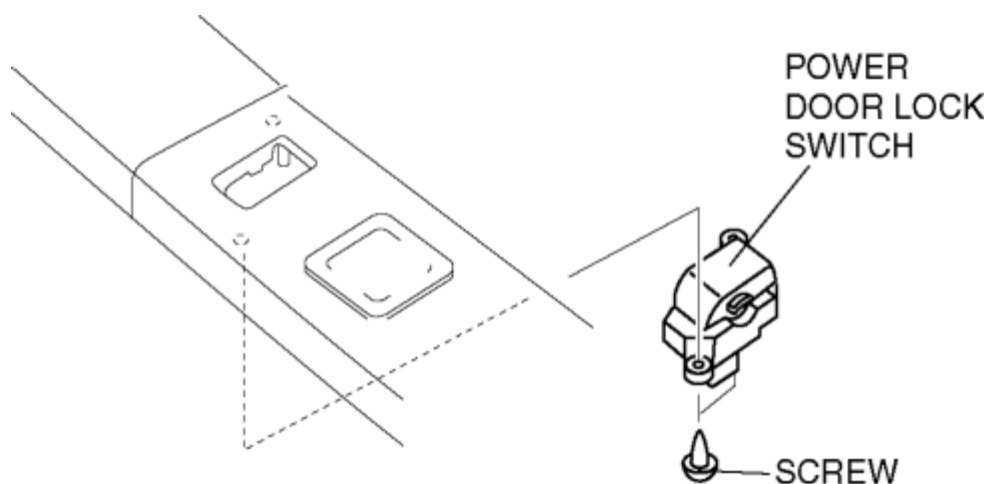
	<ul style="list-style-type: none"><li>• Is the resistance normal?<ul style="list-style-type: none"><li>◦ Power retractable hardtop (open) switch pressed: <b>0.99—1.01 kΩ</b></li><li>◦ Power retractable hardtop (close) switch pressed: <b>2.18—2.22 kΩ</b></li></ul></li></ul>		(See <b>POWER RETRACTABLE HARDTOP SWITCH REMOVAL/INSTALLATION.</b> )
26*	<b>INSPECT POWER RETRACTABLE HARDTOP SWITCH WIRING HARNESS</b> <ul style="list-style-type: none"><li>• Turn the ignition switch to the ON position.</li><li>• Disconnect the power retractable hardtop control module (24-pin) and power retractable hardtop switch connectors.</li><li>• Inspect for an open or short circuit and poor connection between the power retractable hardtop control module terminal 1H and the power retractable hardtop switch terminal F.</li><li>• Is there any open or short circuit, or poor connection?</li></ul>	Yes	Repair or replace the malfunctioning part.
		No	Replace the power retractable hardtop control module.  (See <b>POWER RETRACTABLE HARDTOP CONTROL MODULE REMOVAL/INSTALLATION.</b> )

## 2008 - MX-5 - Body and Accessories

### DOOR LOCK SWITCH REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]

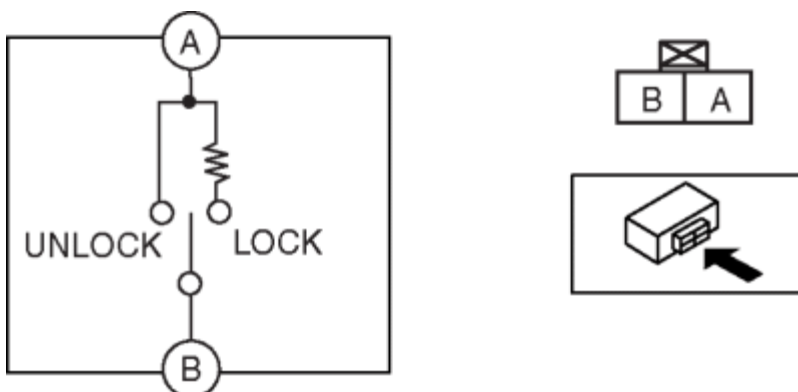
#### LH

1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
2. Remove the door trim. (See [DOOR TRIM REMOVAL/INSTALLATION](#).)
3. Remove the screws, then remove the door lock switch.





4. Install in the reverse order of removal.

1. Inspect for continuity between the door lock switch terminals.



- If not as specified, replace the door lock switch.

○—○ : Continuity ○○ : Resistance

Position	Terminal	
	J (B)	L (A)
Lock	○—○  ○	○
Unlock	○—○	○

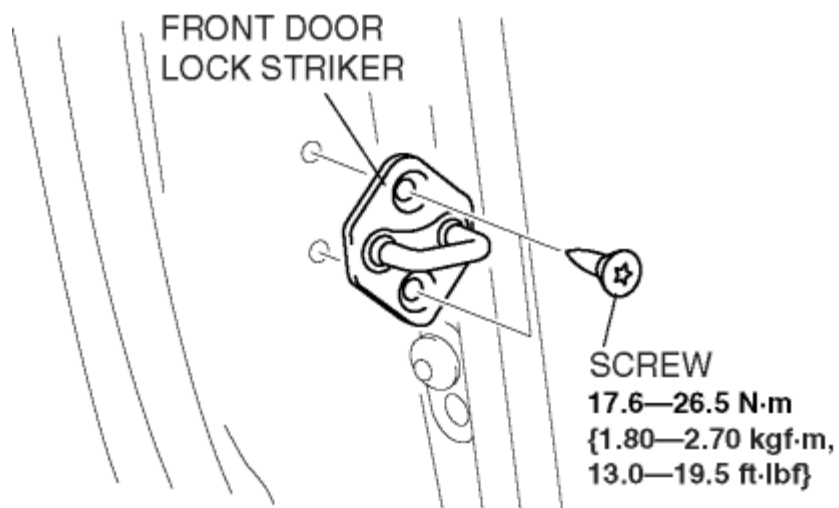
( ): RH R: 940 - 1060 ohms



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### DOOR LOCK STRIKER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]

1. Remove the screws, and then remove the door lock striker.

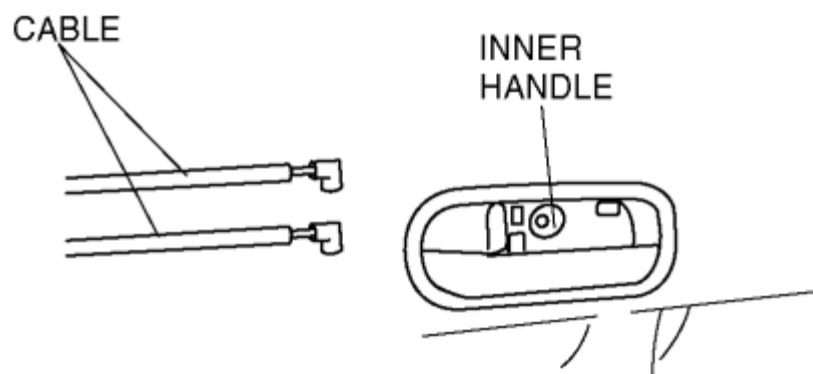


2. Install in the reverse order of removal.
3. Adjust the door. (See [DOOR ADJUSTMENT](#).)

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### INNER HANDLE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]

1. Remove the door trim. (See [DOOR TRIM REMOVAL/INSTALLATION.](#))
2. Remove the screws, then remove the inner handle.

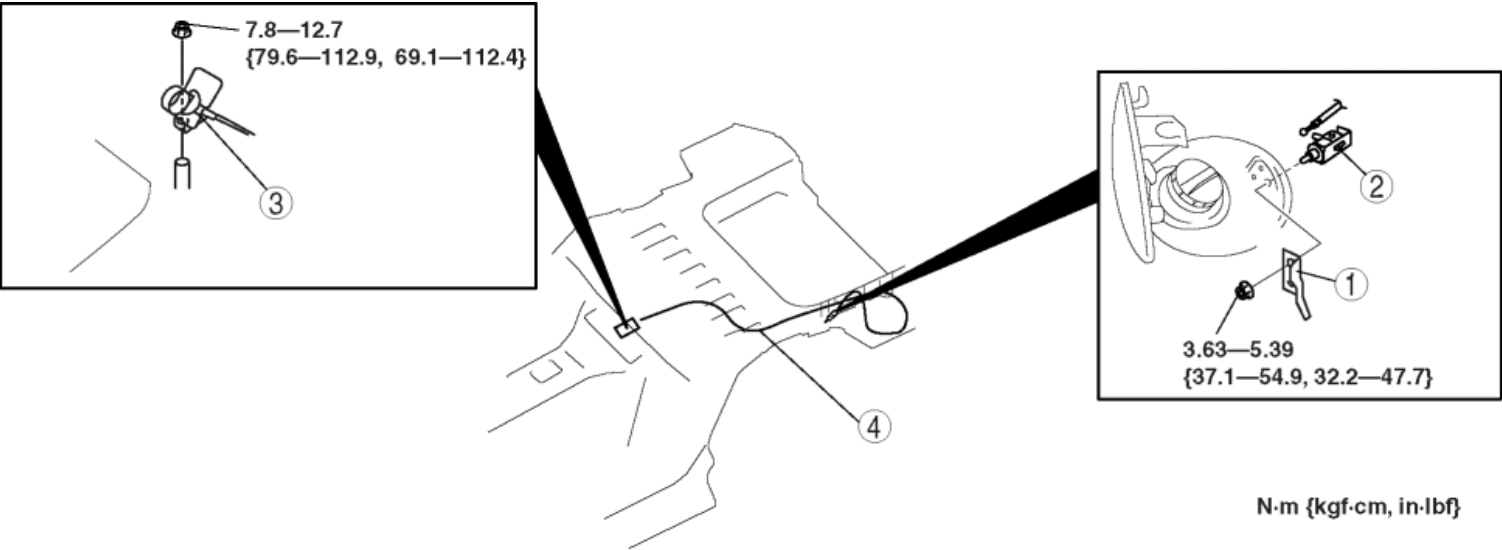


3. Detach the cables from the inner handle and door lock knob.
4. Install in the reverse order of removal.

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FUEL-FILLER LID OPENER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]

- 1. To remove the fuel-filler lid opener, remove the trunk side trim (LH). (See [TRUNK SIDE TRIM REMOVAL/INSTALLATION.](#))
- 2. When removing the fuel-filler lid opener lever and cable, perform the following procedure:
  - a. Remove the seats. (See [SEAT REMOVAL/INSTALLATION.](#))
  - b. Remove the back trim. (See [BACK TRIM REMOVAL/INSTALLATION.](#))
  - c. Remove the seat back bar lower garnish. (See [SEAT BACK BAR LOWER GARNISH REMOVAL/INSTALLATION.](#))
- 3. Remove in the order indicated in the table.



1	Lift spring
2	Fuel-filler lid opener
3	Fuel-filler lid opener lever
4	Fuel-filler lid opener cable

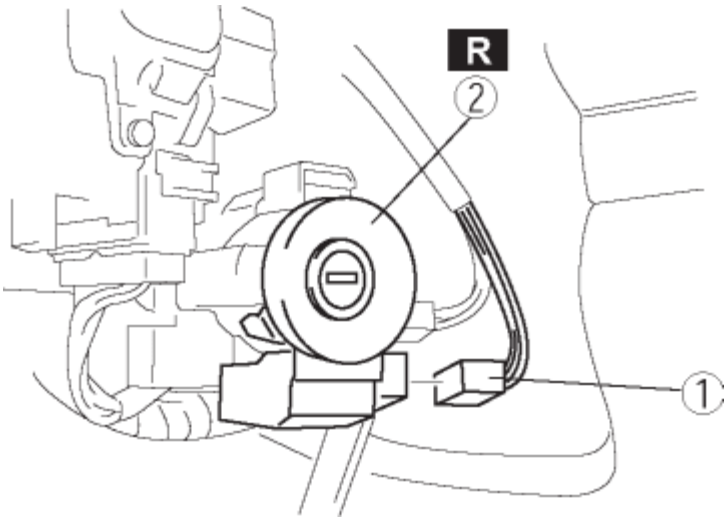
- 4. Install in the reverse order of removal.
- 5. Adjust the fuel-filler lid. (See [FUEL-FILLER LID ADJUSTMENT.](#))

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COIL ANTENNA REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]

NOTE:

- Do not remove the coil antenna unless you are replacing it.
  - When only the coil antenna is replaced, the immobilizer system reprogram procedure is not necessary.
1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
  2. Remove the column cover.
  3. Remove in the order indicated in the table.

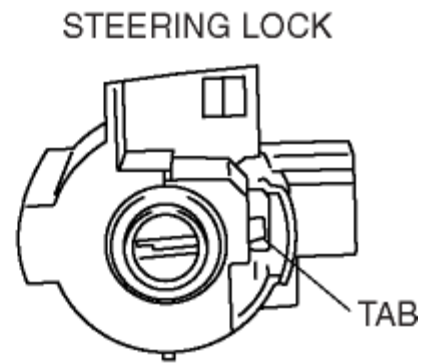
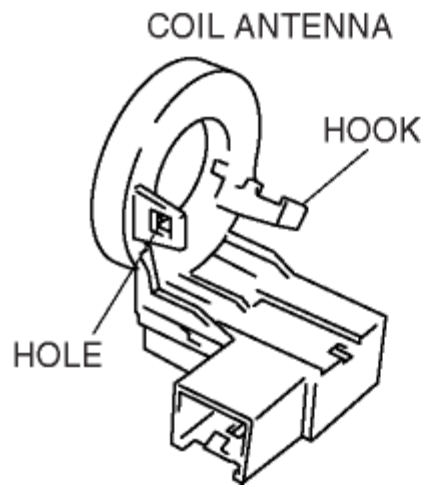


1	Connector
2	Coil Antenna
	(See <a href="#">Coil Antenna Installation Note</a> )

4. Install in the reverse order of removal.

Coil Antenna Installation Note

1. Install the hole of coil antenna to the tab of steering lock.



2. Install the hook of coil antenna to the steering lock.

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## 2008 - MX-5 - Body and Accessories

### IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]

#### Foreword

- When performing the following procedures, the immobilizer resetting procedure using the M-MDS must also always be performed: "Keyless control module replacement", "PCM replacement", "Steering lock unit replacement", "Keyless control module and PCM joint replacement", "Keyless control module, PCM, and steering lock unit joint replacement", and "Key ID number clearing". The engine will not start unless all work is performed using the M-MDS.
- A card key that can start the engine is necessary for the key programming. If there is no card key that can start the engine, perform the key programming after the card key programming. (See [CARD KEY ID CODE REGISTRATION \[ADVANCED KEYLESS SYSTEM\]](#).)
- There are two ways to add supplemental key: Using the M-MDS or using two keys that can start the engine to program.
- When replacing any of the immobilizer system component parts, adding/clearing keys, or performing other functions, refer to the following table and perform the applicable procedure (No.1 to 5).
- Verify that the room fuse is equipped.

Ref. No.	Condition	Items necessary for procedure (prepare before starting procedure)	Cautionary notes
1	Since two or more keys that can start the engine are necessary, make a spare key. Or program an additional key.	<ul style="list-style-type: none"> <li>• Programming key</li> </ul>	<ul style="list-style-type: none"> <li>• The M-MDS is necessary for the additional key programming if "Customer spare key programming disable" is performed before the procedure using the M-MDS. In this case, perform No. 2.</li> </ul>
2	If there is only one key that can start the engine, make a spare key. If there is no key, program an additional key.	<ul style="list-style-type: none"> <li>• Programmed card key</li> <li>• Programming key</li> <li>• M-MDS</li> </ul>	-
3	Replacing the PCM only.	<ul style="list-style-type: none"> <li>• New PCM</li> <li>• Programmed card key or programmed key</li> <li>• M-MDS</li> </ul>	-
4	Changing the additional key programming procedure. (Method for programming other keys using two keys that can start the engine is disabled.)	<ul style="list-style-type: none"> <li>• M-MDS</li> </ul>	<ul style="list-style-type: none"> <li>• The additional key programming using No. 1 cannot be performed after the procedure. It is possible to restore the setting. For restoring the setting, the M-MDS is necessary.</li> </ul>
4	Changing the additional key programming procedure. Allows programming using two keys that can start the engine.	<ul style="list-style-type: none"> <li>• M-MDS</li> </ul>	<ul style="list-style-type: none"> <li>• New vehicles have this setting.</li> </ul>
3	Clearing the programmed key ID number.	<ul style="list-style-type: none"> <li>• Programming keys (two or more)</li> <li>• M-MDS</li> </ul>	<ul style="list-style-type: none"> <li>• Carry out the following procedure using the M-MDS, then go to <ul style="list-style-type: none"> <li>▪ Ignition Key Code Erase</li> </ul> </li> </ul>
	Replacing all the keys. (Steering lock unit is not	<ul style="list-style-type: none"> <li>• Programmed</li> </ul>	

3	replaced)	<ul style="list-style-type: none"> <li>card key</li> <li>• Programming keys (two or more)</li> <li>• M-MDS</li> </ul>	
5	Replacing the steering lock unit.	<ul style="list-style-type: none"> <li>• New steering lock unit</li> <li>• Programmed card key</li> <li>• New keys (two or more)</li> <li>• M-MDS</li> </ul>	<ul style="list-style-type: none"> <li>• Carry out the following procedure using the M-MDS, then go to <ul style="list-style-type: none"> <li>▪ Ignition Key Code Erase</li> <li>▪ STEERING LOCK UNIT PROGRAMMING</li> </ul> </li> </ul>
5	Replacing the keyless control module.	<ul style="list-style-type: none"> <li>• New keyless control module</li> <li>• Card key</li> <li>• Programming keys (two or more)</li> <li>• M-MDS</li> </ul>	<ul style="list-style-type: none"> <li>• Carry out the following procedure using the M-MDS, then go to <ul style="list-style-type: none"> <li>▪ Ignition Key Code Erase</li> <li>▪ CARD KEY PROGRAMMING</li> <li>▪ STEERING LOCK UNIT PROGRAMMING</li> </ul> </li> </ul>
5	Replacing the instrument cluster.	<ul style="list-style-type: none"> <li>• New instrument cluster</li> <li>• Card key</li> <li>• Programming keys (two or more)</li> <li>• M-MDS</li> </ul>	<ul style="list-style-type: none"> <li>• Carry out the following procedure using the M-MDS, then go to <ul style="list-style-type: none"> <li>▪ Ignition Key Code Erase</li> <li>▪ Parameter Reset</li> </ul> </li> </ul>
-	Replacing the coil antenna.	<ul style="list-style-type: none"> <li>• New coil antenna</li> </ul>	<ul style="list-style-type: none"> <li>• Immobilizer system resetting is not necessary.</li> </ul>

#### CAUTION:

- The following conditions may cause poor signal communication between the key and vehicle, resulting in the engine not starting or a key registration error. Do not perform any work under the following conditions:
  - Placing the following items close to the key grip or contacting it.
    - Spare keys
    - Keys for other vehicles equipped with an immobilizer system
    - Any metallic object
    - Any electronic device, or any credit or other card with magnetic strips
- Do not place the following devices in the vehicle while programming, otherwise programming cannot be performed:
  - M-MDS
  - Personal computer
  - Devices that can send/receive the radio waves

#### NOTE:

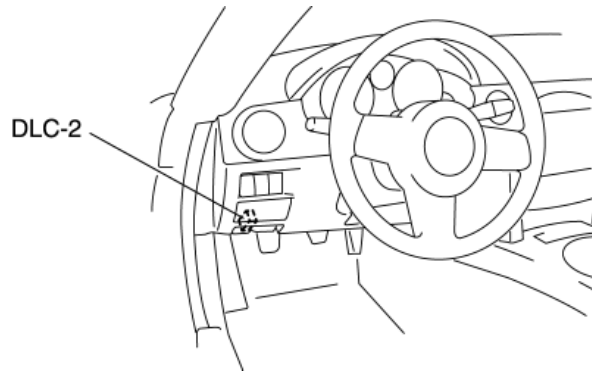
- The “valid key” used in this manual indicates the key that can start the engine.
- If the key adding, programming, clearing, and immobilizer system construction parts replacement are performed, verify that the all keys can start the engine within **5 s** after the procedure.
- When verifying that the engine starts, wait at least **5 s or more** before starting the engine using the next key.
- If the engine cannot be started using a programmed key, repeat the procedure from the beginning.

- Do not start the engine unless indicated in the procedure. If the engine is started during the programming procedure, programming is stopped at that point. Repeat the procedure starting from the beginning if the engine is started before completion.
- Do not place the card key in the vehicle or bring it **within approx. 1 m** of the vehicle unless indicated in the procedure.
- Two or more key ID numbers must be programmed for the engine to start.
- A maximum of eight key ID numbers can be programmed for one vehicle. The M-MDS can be used to verify the number of key ID numbers programmed to a single vehicle.
- Do not select a M-MDS screen menu other than one indicated in the procedure.

## M-MDS Connecting Procedure

### CAUTION:

- Do not place the M-MDS in the vehicle while programming, otherwise programming cannot be performed.
1. Fully lower the door glass.
  2. Connect the M-MDS to the DLC-2.



3. Pull out the M-MDS cable from the door glass opening and set the M-MDS outside the vehicle.

### CAUTION:

- Protect the cable and body contact area with a clean rag, otherwise they could be damaged.

## No.1 Additional Key Programming Procedure (Using Two Valid Keys)

### CAUTION:

- Do not place the following devices in the vehicle while programming, otherwise programming cannot be performed:
  - Card key
  - M-MDS
  - Personal computer
  - Devices that can send/receive the radio waves

### Condition

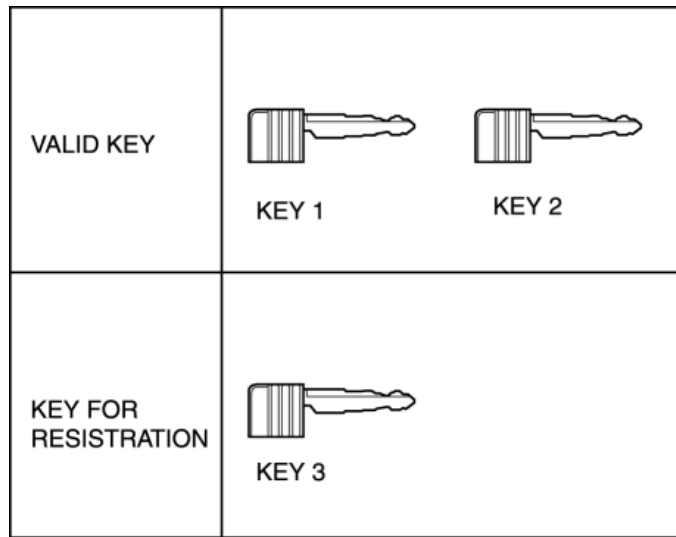
- Have two or more valid keys.

### NOTE:

- A maximum of eight keys can be programmed for one vehicle. If key programming is not successful and DTC 15 appears even though the procedure was performed properly, use the PID/data monitor function of the M-MDS and verify the number of keys that have been programmed.
- If eight keys have already been programmed, and it is necessary to program other keys, the previously programmed key ID numbers must first be cleared. To clear the key, refer to "".

## Procedure





1. Prepare key 3 for programming.
2. Start the engine using key 1.
3. Verify that the security light illuminates for **approx. 3 s**, and then goes out.
4. Turn the ignition switch to the LOCK position.
5. Using key 1, turn the ignition switch to the ON position.
6. Verify that the security light illuminates for **approx. 3 s**, and then goes out.
7. Using key 1, turn the ignition switch to the LOCK position **within approx. 4 s** after the security light goes out.
8. Remove key 1.
9. Repeat Steps 2—5 using key 2 instead of key 1.
10. Repeat Steps 5—8 using key 3 instead of key 1.
11. If additional keys need to be programmed, repeat Steps 1—10, and replace key 3 in Step 10 with the key to be programmed (key 4).

## No. 2 Key Additional Programming Procedure (Using the M-MDS)

### Condition

- There is only one valid key. Or, there is no valid key but there is a card key that can start the engine.

### NOTE:

- A maximum of eight keys can be programmed for one vehicle. If key registration is not successful and DTC 15 appears even though the procedure was performed properly, use the PID/data monitor function of the M-MDS and verify the number of keys that have been programmed.
- If eight keys have already been programmed, and it is necessary to program other keys, the previously programmed key ID numbers must first be cleared. To clear the key ID number, refer to "".

### Procedure

1. Prepare key 1 for programming.
2. Start the engine using a valid key or card key.

### CAUTION:

- Do not place the card key in the vehicle when starting the engine with the valid key, otherwise programming cannot be performed. If the engine is started with the card key, remove the card key from the vehicle after the engine is started.

3. Verify that the security light illuminates for **approx. 3 s**, and then goes out.
4. Turn the ignition switch to the LOCK position.
5. Connect the M-MDS to the DLC-2. (See .)
6. Using key 1, turn the ignition switch to the ON position.

**NOTE:**

- Although the security light flashes and DTC 15 is displayed, this does not indicate an improper procedure. Continue to perform the procedure as indicated.

7. Select "BODY/SECURITY/PATS functions" from the M-MDS screen menu.

8. Select "Program additional ignition key" from the M-MDS screen menu.

**NOTE:**

- After selecting the above menu, "operation is successful" is displayed. At this point, the key that turned the ignition switch to the ON position is completely programmed.
- In this procedure, the necessary number of the keys are completely programmed. To finish the additional key programming, go to Step 13.
- If additional keys need to be programmed, go to the next step.

9. Perform the security access according to the directions on the M-MDS screen. (See [SECURITY ACCESS PROCEDURE \[ADVANCED KEYLESS SYSTEM\]](#).)

10. After verifying that the PATS function menu is displayed again on the M-MDS screen, turn the ignition switch to the LOCK position and remove key 1.

11. Using the key to be programmed, turn the ignition switch to the ON position.

12. Return to the Step 6.

13. After verifying that the PATS function menu is displayed again on the M-MDS screen, select the "Exit (From This Menu)" to finish the M-MDS procedure.

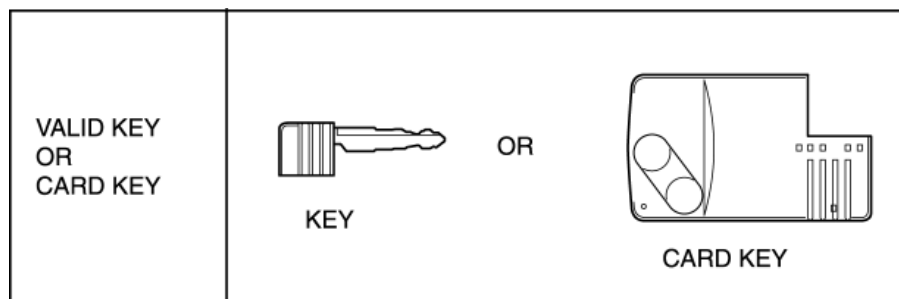
14. After Step 10, wait **5 s or more**, and then turn the ignition switch to the LOCK position.

**No.3 PCM Replacement Procedure****Condition**

- Prepare a valid key or a card key that can start the engine.

**CAUTION:**

- Before starting Step 1, complete the procedure for PCM replacement. (See [PCM REMOVAL/INSTALLATION \[LF\]](#).)

**Procedure**

1. Turn the Ignition switch to the LOCK position.

2. Connect the M-MDS to the DLC-2. (See .)

3. Using a valid key or card key, turn the ignition switch to the ON position.

**NOTE:**

- Although the security light remains illuminated and DTC 23 is displayed after approx. 1 min, this does not indicate an improper procedure. Continue to perform the procedure as indicated.

4. Verify that the keyless warning light illuminates for **approx. 3 s**, and then goes out.

5. Select "BODY/SECURITY/PATS functions" from the M-MDS screen menu.

6. Select "Parameter Reset" from the M-MDS screen menu.

7. Perform the security access according to the directions on the M-MDS screen. (See [SECURITY ACCESS PROCEDURE \[ADVANCED KEYLESS SYSTEM\]](#).)

8. After verifying that the PATS function menu is displayed again on the M-MDS screen, select "Exit (From This Menu)" to finish the M-

MDS procedure.

9. After Step 8, wait **5 s or more**, and then turn the ignition switch to the LOCK position.

10. Turn the ignition switch to the ON position.

11. After verifying that the security light and keyless warning light illuminates for **3 s or more** turn the ignition switch to the LOCK position.

12. Verify that the all keys can start the engine for **5 s or more** after the procedure.

#### No. 4 Key Additional Programming Procedure Changing

##### NOTE:

- This procedure is performed for enabling/disabling the “No.1 Additional Key Programming Procedure (Using Two Valid Keys)” setting.
- This procedure is possible when the vehicle is new, and when replacing the keyless unit with a new one.
- If “No.1 Additional Key Programming Procedure (Using Two Valid Keys)” is set to disable, the additional key programming can be only performed using the M-MDS preventing the forging of a spare key by using two keys that can start the engine. This function is for use by rental car agencies or other companies with vehicle fleets.

##### Procedure

1. Using the key, turn the ignition switch to the ON position. (The key can be either the valid key or an unprogrammed key)

##### NOTE:

- Although the security light flashes and DTC 15 is displayed when an unprogrammed key is used, this does not indicate an improper procedure. Continue to perform the procedure as indicated.

2. Connect the M-MDS to the DLC-2.

3. Select “BODY/SECURITY/PATS functions” from the M-MDS screen menu.

4. Select “Customer Spare Key Programming Enable” or “Customer Spare Key Programming Disable” from the M-MDS screen menu. The key additional programming procedure is as follows according to the selected menu:

Setting	Additional key programming procedure	
	Method using two valid keys	Method using the M-MDS
Customer spare key programming enable	—	—
Customer spare key programming disable	×	—

—

**Available**

×

**Unavailable**

5. Perform the security access according to the directions on the M-MDS screen. (See [SECURITY ACCESS PROCEDURE \[ADVANCED KEYLESS SYSTEM\]](#).)

6. After verifying that the PATS function menu is displayed again on the M-MDS screen, select “Exit (From This Menu)” to finish the M-MDS procedure.

7. After Step 6, wait **5 s or more** and then turn the ignition switch to the LOCK position.

#### No.5 Resetting Procedure for the Immobilizer System when Replacing the related parts (PCM, Keyless Control Module, Instrument cluster, or Steering Lock Unit)

##### Condition

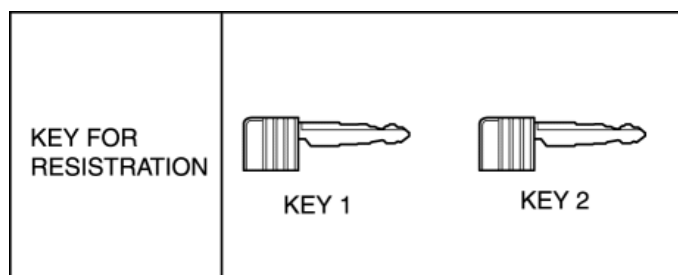
- When the keyless control module is replaced
  - Have one or more card keys to be programmed after the replacement.
  - Have two or more keys to be programmed after the replacement.

- When the keyless control module is not to be replaced
  - Have one or more card keys to be programmed.
  - Have two or more keys to be programmed after the replacement.

#### CAUTION:

- Perform the procedures in the following order: "Ignition Key Code Erase and Program", "Program Additional card key", "Steering lock unit programming", and "Program additional ignition key". If there is a failure in the programming, the engine may not be started.
- When replacing only the PCM, start from Step 2. Key 1 in the procedure can be any valid key.
- Perform the "card key programming procedure" in Step 11 only when the keyless control module is replaced.
- Perform the "steering lock unit programming procedure" in Step 12 only when either the keyless control module or steering lock unit is replaced.

#### Procedure



1. Prepare two or more keys to be programmed after the key ID number is cleared.
2. Connect the M-MDS to the DLC-2. (See .)
3. Using key 1, turn the ignition switch to the ON position.
4. Verify that the keyless warning light illuminates for **approx. 3 s** and then goes out.
5. Select "BODY/SECURITY/PATS functions" from the M-MDS screen menu.
6. Select "Ignition Key Code Erase and Program" from the M-MDS screen menu and perform the procedure according to the M-MDS screen.
7. Perform the security access according to the directions on the M-MDS screen. (See [SECURITY ACCESS PROCEDURE \[ADVANCED KEYLESS SYSTEM\]](#).)

#### CAUTION:

- The M-MDS displays "At least two or more keys must be programmed", however, do not perform the key programming and proceed to Step 8. If the procedure is not followed, the engine may not be started.

The key programming procedure is performed at Step 13—16.

8. Select "Parameter Reset" from the M-MDS screen menu.
9. Perform security access again as indicated on the M-MDS screen. (See [SECURITY ACCESS PROCEDURE \[ADVANCED KEYLESS SYSTEM\]](#).)
10. Select the replaced part as indicated on the M-MDS screen.
  - When replacing only the PCM: Select "PCM".
  - When replacing only the instrument cluster: Select "HEC".
  - When replacing only the keyless control module: Select "RKE".

#### NOTE:

- At this time, do not select any other parts from the M-MDS screen menu.
11. Perform "Program Additional card key". (When replacing keyless control module) (See [CARD KEY ID CODE REGISTRATION \[ADVANCED KEYLESS SYSTEM\]](#).)
  12. Perform "Steering Lock Unit Programming". (When steering lock unit) (See [STEERING LOCK UNIT ID CODE REGISTRATION \[ADVANCED KEYLESS SYSTEM\]](#).)
  13. After verifying that the PATS function menu is displayed again on the M-MDS screen, select "Exit (From This Menu)" to finish the M-MDS procedure.
  14. After Step 13, wait **5 s or more** and then turn the ignition switch to the LOCK position.

15. Using key 1, turn the ignition switch to the ON position.

16. After verifying that the security light and keyless warning light illuminate **for 3 s or more**, turn the ignition switch to the LOCK position and remove key 1.

**NOTE:**

- Although the security light flashes and DTC 21 is displayed, this does not indicate an improper procedure. Continue to perform the procedure as indicated.

17. Using key 2, turn the ignition switch to the ON position.

18. Verify that the security light and keyless warning light illuminate **for approx. 3 s**, and then goes out.

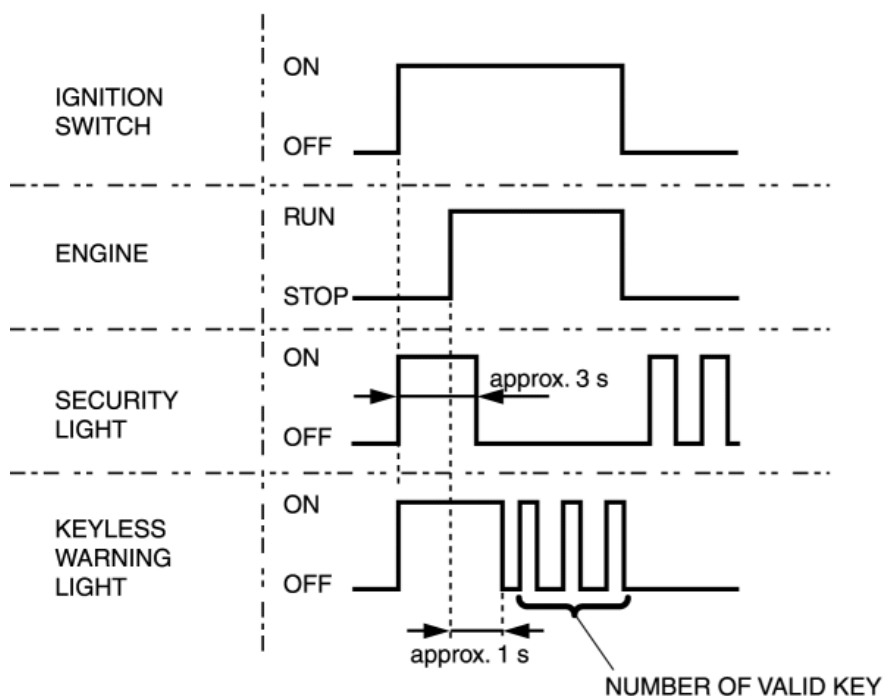
19. After verifying that the security light goes out, turn the ignition switch to the LOCK position using key 2, and then remove key 2.

20. If additional keys need to be programmed, repeat Steps 13—14 with the additional key to be programmed being key 3. If the ignition switch is held in the ON position **for 1 min or more**, additional key programming according to Steps 18—19 will not be possible. If this occurs, refer to " " to program any additional keys.

21. Start the engine with key 1.

22. Verify that the security light and keyless warning light operate as follows:

- From the point when the ignition switch is turned to the ON position, the security light illuminates **for approx. 3 s**, and goes out.
- The keyless warning light illuminates when the ignition switch is turned to the ON position, and the light goes out after **approx. 1 s**, and then displays the number of the programmed keys.



**EXAMPLE**

NUMBER OF VALID KEY	DISPLAY
1	
2	
3	

a : approx. 0.3 s  
b : approx. 0.9 s

23. After verifying that the keyless warning light goes out, turn the ignition switch to the LOCK position using key 1, and then remove the key.

24. Repeat Steps 22—23 using key 2 instead of key 1.

**NOTE:**

- Perform Steps 22—23 as well when three or more keys are to be programmed.

25. Start the engine using the card key.

**CAUTION:**

- Remove any key from the key cylinder.

26. Verify that the security light and keyless warning light operate as follows:

- From the point that ignition switch is turned to the ON position, the security light illuminates **for approx. 3 s**, and goes out.

- The keyless warning light illuminate when the ignition switch is turned to the ON position for **approx. 1 min**, and goes out.

27. After verifying that the keyless warning light goes out, turn the ignition switch to the LOCK position.

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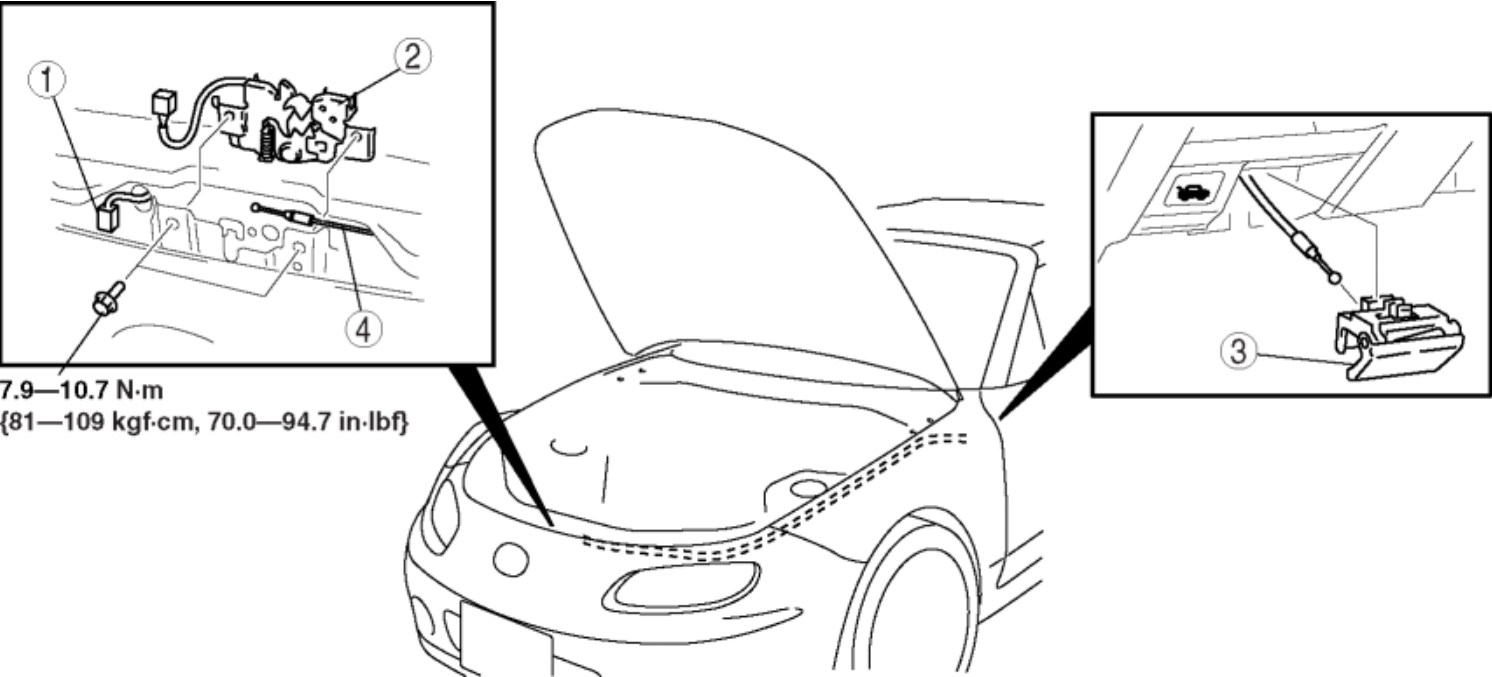
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2008 - MX-5 - Body and Accessories

HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]

1. Remove in the order indicated in the table.

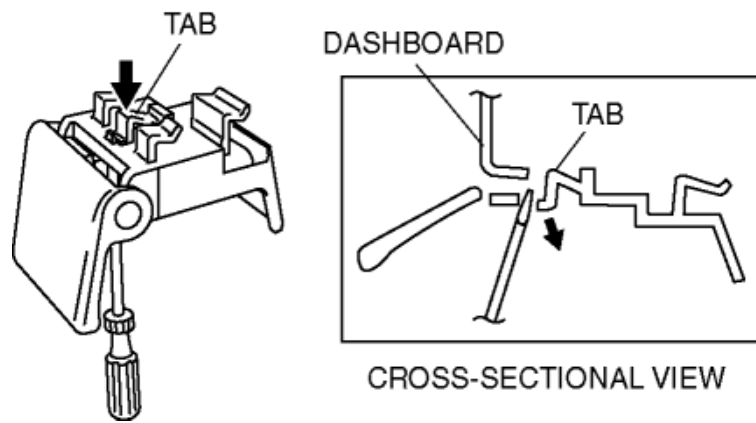


1	Connector
2	Hood latch
3	Hood release lever (See <a href="#">Hood Release Lever Removal Note.</a> )
4	Hood release cable

2. Install in the reverse order of removal.
3. Adjust the hood. (See [HOOD ADJUSTMENT.](#))

Hood Release Lever Removal Note

1. Pull the lever.
2. While pushing the tab in the direction of the arrow using a tape-wrapped, small flathead screwdriver, detach it from the dashboard.



**CAUTION:**

- Remove the hood release lever while taking care not to damage the hood release cable with the flathead screwdriver.

3. Under the condition in Step 2, pull the hood release lever outward, then remove it from the dashboard.

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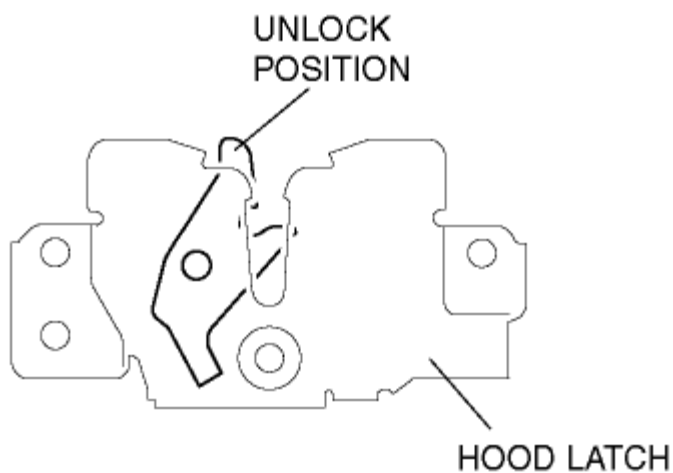
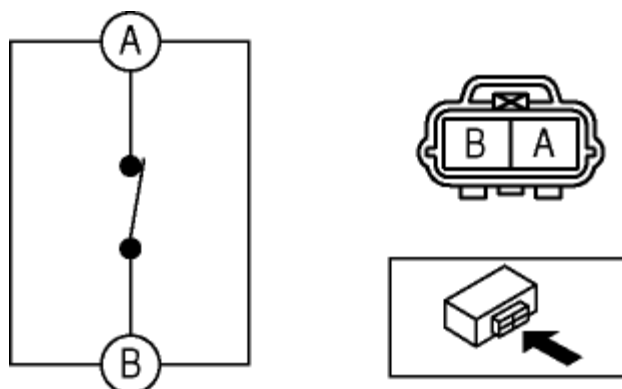
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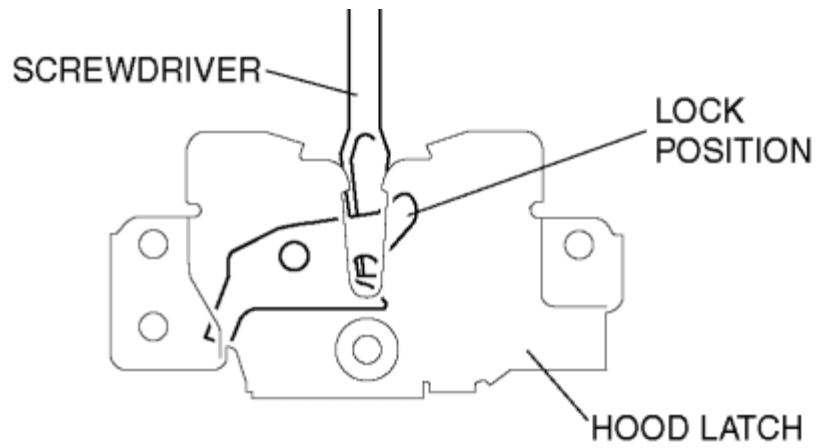
## 2008 - MX-5 - Body and Accessories

### HOOD LATCH SWITCH INSPECTION [ADVANCED KEYLESS SYSTEM]

1. Open the hood.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Disconnect the hood latch switch connector.
4. Inspect for continuity between the hood latch switch terminals A and B.



- If there is no continuity, replace the hood latch.
5. Lock the hood latch using a flathead screwdriver or equivalent as shown.



6. Inspect for continuity between the hood latch switch terminals A and B

- If there is continuity, replace the hood latch.

**CAUTION:**

- After the inspection, unlock the hood latch. If closing the hood with the hood latch locked, the hood latch and/or hood striker may be broken.

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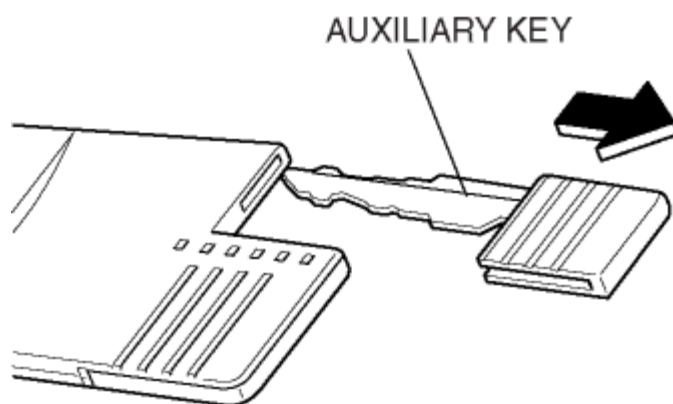
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## 2008 - MX-5 - Body and Accessories

### CARD KEY BATTERY REPLACEMENT [ADVANCED KEYLESS SYSTEM]

#### Card Key Type

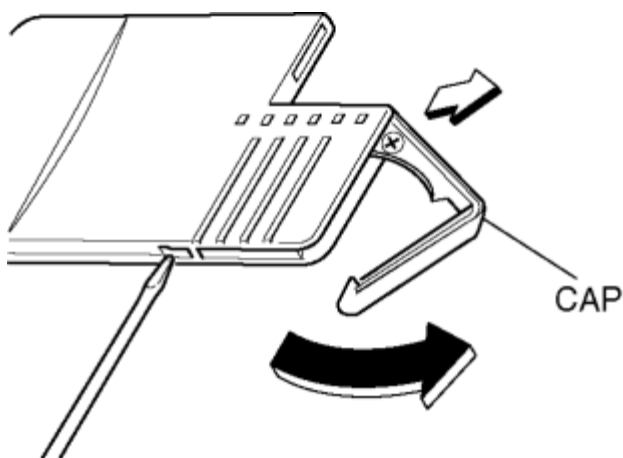
1. Pull out the auxiliary key.



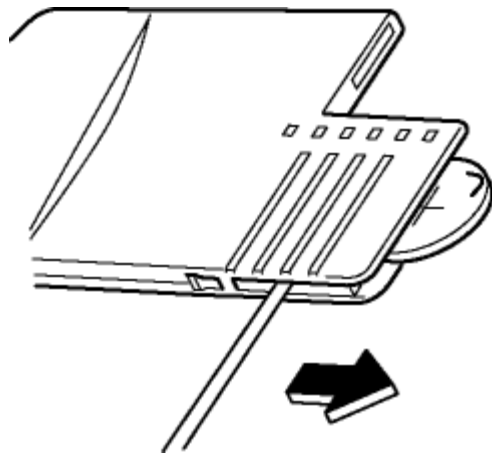
2. Replace the cap using a flathead screwdriver, then rotate and remove the cap.

#### CAUTION:

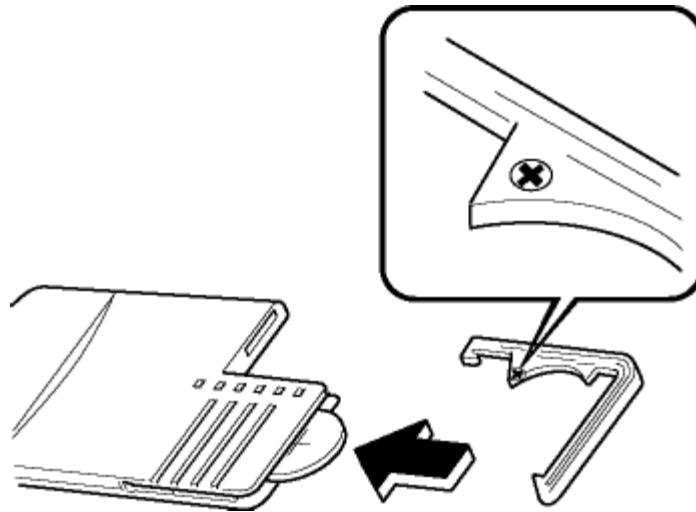
- Do not turn the cap excessively. The cap may be damaged.



3. Insert a flathead screwdriver into the crack and press the battery out.



4. Insert the new battery (CR2025) with the positive pole (+) facing the (+) mark on the cap.



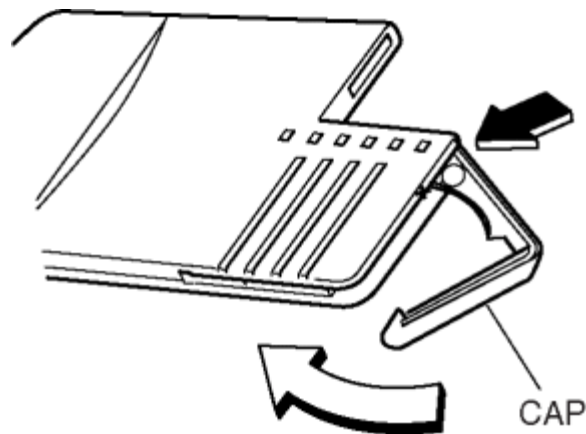
#### Battery specification

- Lithium CR2025 × 1

#### NOTE:

- The batteries will last about **1 years** when used **10 times** a day.

5. Rotate and close the cap.



6. Reinsert the auxiliary key.



## 2008 - MX-5 - Body and Accessories

### KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]

#### NOTE:

- If the keyless control module is replaced, always perform the following procedure.

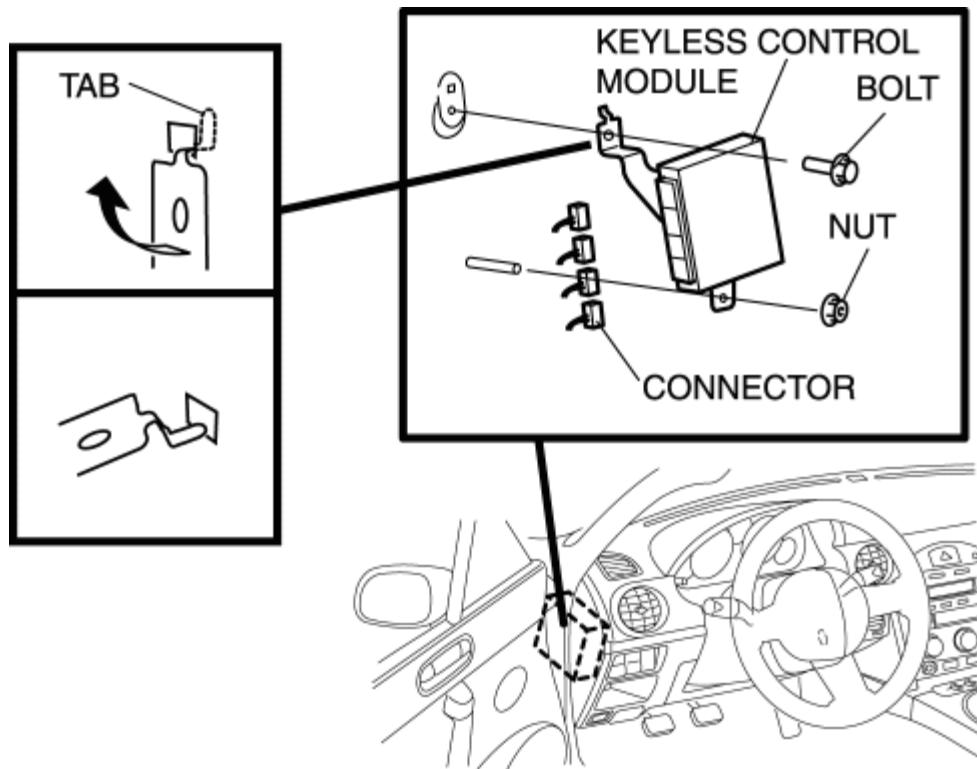
#### **Without immobilizer system**

- Keyless control module configuration (See [KEYLESS CONTROL MODULE CONFIGURATION \[ADVANCED KEYLESS SYSTEM\]](#).)
- Card key programming (See [CARD KEY ID CODE REGISTRATION \[ADVANCED KEYLESS SYSTEM\]](#).)
- Steering lock unit programming (See [STEERING LOCK UNIT ID CODE REGISTRATION \[ADVANCED KEYLESS SYSTEM\]](#).)

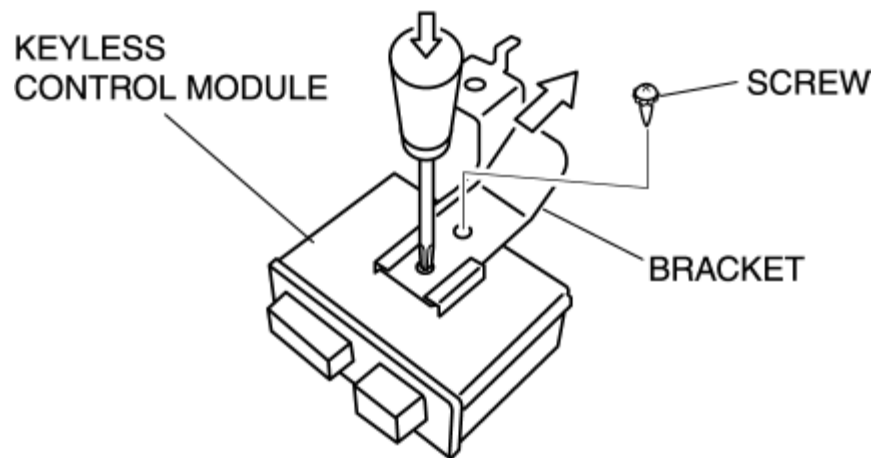
#### **With immobilizer system**

- Keyless control module configuration (See [KEYLESS CONTROL MODULE CONFIGURATION \[ADVANCED KEYLESS SYSTEM\]](#).)
- Card key programming (See [CARD KEY ID CODE REGISTRATION \[ADVANCED KEYLESS SYSTEM\]](#).)
- Steering lock unit programming (See [STEERING LOCK UNIT ID CODE REGISTRATION \[ADVANCED KEYLESS SYSTEM\]](#).)
- Immobilizer system resetting (with immobilizer system) (See [IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING \[ADVANCED KEYLESS SYSTEM\]](#).)

1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
2. Remove the side panel. (See [SIDE PANEL REMOVAL/INSTALLATION](#).)
3. Remove the bolt and nut.



4. While inclining the keyless control module along the body panel in the direction indicated by the arrow, disengage the bracket tab from the hole in the body panel.
5. Disconnect the keyless control module connector.
6. Remove the keyless control module.
7. Remove the screw, then remove the bracket.



**NOTE:**

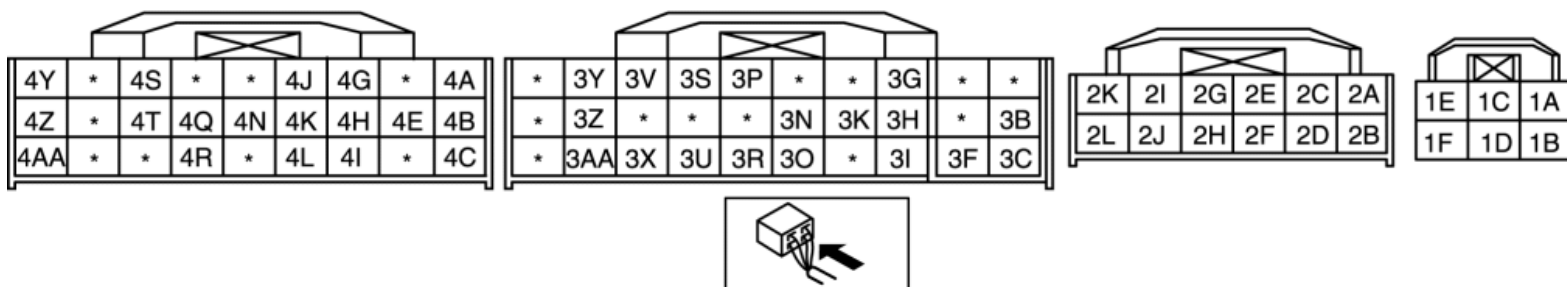
- The screw which fixes the keyless control module and bracket is for a body ground connection. Be sure to secure the screw when installing.

8. Install in the reverse order of removal.

1. Measure the voltage or inspect for continuity according to the Terminal Voltage Table (Reference).

- If the voltage is not as specified in the Terminal Voltage Table (Reference), inspect the parts under "Inspection item(s)" and related wiring harnesses.

## KEYLESS CONTROL MODULE WIRING HARNESS SIDE CONNECTOR



Terminal	Signal name	Connected to	Measured condition	Voltage (V)/Continuity	Inspection item(s)
1A	Door unlock control	Door lock actuator (driver's side)	Door lock actuator unlocking	1.0 or less → B+ → 1.0 or less	<ul style="list-style-type: none"> <li>Door lock actuator (driver's side)</li> <li>Related wiring harnesses</li> </ul>
			Other	1.0 or less	
1B	GND	GND	Under any condition: Inspect for continuity to GND.	Continuity detected	<ul style="list-style-type: none"> <li>Related wiring harnesses</li> </ul>
1C	Door lock control	Door lock actuator	Door lock actuator locking	1.0 or less → B+ → 1.0 or less	<ul style="list-style-type: none"> <li>Door lock actuator</li> <li>Related wiring harnesses</li> </ul>
			Other	1.0 or less	
1D	Door unlock control	Door lock actuator (except driver's side)	Door lock actuator unlocking	1.0 or less → B+ → 1.0 or less	<ul style="list-style-type: none"> <li>Door lock actuator (except driver's side)</li> <li>Related wiring harnesses</li> </ul>
			Other	1.0 or less	
1E	Power supply	D.LOCK 30 A fuse	Under any condition	B+	<ul style="list-style-type: none"> <li>D.LOCK 30 A fuse</li> <li>Battery</li> </ul>



1F	Power supply	ROOM 15 A fuse	Under any condition	B+	<ul style="list-style-type: none"> <li>ROOM 15 A fuse</li> <li>Battery</li> </ul>
2A	keyless antenna (exterior, RF)(+)	keyless antenna (exterior, RF)	Under any condition: Inspect for continuity to keyless antenna.	Continuity detected	keyless antenna (exterior, RF)
2B	keyless antenna (exterior, RF)(-)	keyless antenna (exterior, RF)	Under any condition: Inspect for continuity to keyless antenna.	Continuity detected	keyless antenna (exterior, RF)
2C	keyless antenna (exterior, LF)(+)	keyless antenna (exterior, LF)	Under any condition: Inspect for continuity to keyless antenna.	Continuity detected	keyless antenna (exterior, LF)
2D	keyless antenna (exterior, LF)(-)	keyless antenna (exterior, LF)	Under any condition: Inspect for continuity to keyless antenna.	Continuity detected	keyless antenna (exterior, LF)
2E	keyless antenna (exterior, rear) (+)	keyless antenna (exterior, rear)	Under any condition: Inspect for continuity to keyless antenna.	Continuity detected	keyless antenna (exterior, rear)
2F	keyless antenna (exterior, rear) (-)	keyless antenna (exterior, rear)	Under any condition: Inspect for continuity to keyless antenna.	Continuity detected	keyless antenna (exterior, rear)
2G	keyless antenna (interior, trunk) (+)	keyless antenna (interior, trunk)	Under any condition: Inspect for continuity to keyless antenna.	Continuity detected	keyless antenna (interior, trunk)
2H	keyless antenna (interior, trunk) (-)	keyless antenna (interior, trunk)	Under any condition: Inspect for continuity to keyless antenna.	Continuity detected	keyless antenna (interior, trunk)
2I	keyless antenna (interior, rear) (+)	keyless antenna (interior, rear)	Under any condition: Inspect for continuity to keyless antenna.	Continuity detected	keyless antenna (interior, rear)
2J	keyless antenna (interior, rear) (-)	keyless antenna (interior, rear)	Under any condition: Inspect for continuity to keyless antenna.	Continuity detected	keyless antenna (interior, rear)
2K	keyless antenna (interior, middle)(+)	keyless antenna (interior, middle)	Under any condition: Inspect for continuity to keyless antenna.	Continuity detected	keyless antenna (interior, middle)
2L	keyless antenna (interior, middle)(-)	keyless antenna (interior, middle)	Under any condition: Inspect for continuity to keyless antenna.	Continuity detected	keyless antenna (interior, middle)
3B	IG1	ENGINE 10 A fuse	Ignition switch is at ON position	B+	ENGINE 10 A fuse
			Ignition switch is at LOCK or ACC position	1.0 or less	
3C	GND	body ground	Under any condition: Inspect for continuity to ground.	Continuity detected	GND
3F	Security light	Instrument cluster	Under any condition: Inspect for continuity to instrument cluster.	Continuity detected	Instrument cluster
3G	keyless antenna (interior, front)(+)	keyless antenna (interior, front)	Under any condition: Inspect for continuity to keyless antenna.	Continuity detected	keyless antenna (interior, front)

3H	keyless antenna (interior, front)(-)	keyless antenna (interior, front)	Under any condition: Inspect for continuity to keyless antenna.	Continuity detected	keyless antenna (interior, front)
3I	ACC	METER 10 A fuse	Ignition switch is at ACC position	B+	METER 10 A fuse
			Ignition switch is at LOCK or ON position	1.0 or less	
3K	Buzzer (interior)	Instrument cluster	Buzzer operated	1.0 or less	Instrument cluster
			Other	5.0	
3N	Start knob (push switch)	Steering lock unit	Start knob is Pushed	B+	Steering lock unit
			Other	1.0 or less	
3O	Key reminder switch	Steering lock unit	Key reminder switch is ON	B+	Steering lock unit
			Other	1.0 or less	
3P	Communication (steering lock unit)	Steering lock unit	Under any condition: Inspect for continuity to steering lock unit.	Continuity detected	Steering lock unit
3R	TPMS signal	Instrument cluster	Under any condition: Inspect for continuity to instrument cluster.	Continuity detected	Instrument cluster
3S	Power supply (keyless receiver, front)	Keyless receiver, front	Under any condition	B+	Keyless receiver, front
3U	Communication (keyless receiver, front)	Keyless receiver, front	Under any condition: Inspect for continuity to keyless receiver, front.	Continuity detected	Keyless receiver, front
3V	Power supply (keyless receiver, rear)	Keyless receiver, rear	Under any condition	B+	Keyless receiver, rear
3X	Communication (keyless receiver, rear)	Keyless receiver, rear	Under any condition: Inspect for continuity to keyless receiver, rear.	Continuity detected	Keyless receiver, rear
3Y*1	Tx-PATS	Coil antenna	Ignition switch is at ON position	B+	Coil antenna
			Ignition switch is at LOCK or ACC position	1.0 or less	
3Z	Trunk open signal	Trunk compartment light switch	Trunk lid open (trunk compartment light switch on)	1.0 or less	<ul style="list-style-type: none"> <li>Trunk compartment light switch</li> <li>Related wiring harnesses</li> </ul>
			Trunk lid closed (trunk compartment light switch off)	B+	
3AA*1	Rx-PATS	Coil antenna	Ignition switch is at ON position	5.0	Coil antenna
			Ignition switch is at LOCK or ACC position	1.0 or less	
4A*1	Tx	Instrument cluster	Ignition switch is at ON position	B+	Instrument cluster
			Ignition switch is at LOCK or ACC position	1.0 or less	

4B	Lock/unlock input	Door lock switch	Door lock switch is locked	2.5	<ul style="list-style-type: none"> <li>Door lock switch (driver-side)</li> <li>Door lock switch (passenger-side)</li> <li>Related wiring harnesses</li> </ul>
			Door lock switch is unlocked	1.0 or less	
			Other	5	
4C*1	Rx	Instrument cluster	Ignition switch is at ON position	B+	Instrument cluster
			Ignition switch is at LOCK or ACC position	1.0 or less	
4E	Lock signal input	Door lock-link switch (driver-side)	Driver-side door is locked: Inspect for continuity to ground.	Continuity detected	Door lock-link switch (driver-side)
			Driver-side door is unlocked: Inspect for continuity to ground.	No continuity	
4G	Lock/unlock input	Driver-side door key cylinder switch	At the moment key cylinder is locked	2.5	<ul style="list-style-type: none"> <li>Driver-side door key cylinder switch</li> <li>Related wiring harnesses</li> </ul>
			At the moment key cylinder is unlocked	1.0 or less	
			At the moment key cylinder is neutral position	5	
4H	Request switch input (RH)	Request switch (RH)	Request switch (RH) is ON: Inspect for continuity to ground.	Continuity detected	Request switch (RH)
			Request switch (RH) is OFF: Inspect for continuity to ground.	No continuity	
4I	Unlock signal input	Door lock-link switch (driver-side)	Driver-side door is unlocked: Inspect for continuity to ground.	Continuity detected	Door lock-link switch (driver-side)
			Driver-side door is locked: Inspect for continuity to ground.	No continuity	
4J	Request switch input (LH)	Request switch (LH)	Request switch (LH) is ON: Inspect for continuity to ground.	Continuity detected	Request switch (LH)
			Request switch (LH) is OFF: Inspect for continuity to ground.	No continuity	
4K	Unlock input (trunk lid)	Trunk key cylinder switch	At the moment key cylinder is unlocked	1.0 or less	<ul style="list-style-type: none"> <li>Trunk key cylinder switch</li> <li>Related wiring harnesses</li> </ul>
			At the moment key cylinder is neutral position	5	
4L	Request switch input (trunk lid)	Request switch (trunk lid)	Trunk lid request switch is ON: Inspect for continuity to ground.	Continuity detected	Request switch (trunk lid)
			Trunk lid request switch is OFF: Inspect for continuity to ground.	No continuity	

4N	Hazard output	Hazard warning light	Press the LOCK button (transmitter)	B+→1.0 or less→B+	<ul style="list-style-type: none"> <li>Hazard warning light</li> <li>Related wiring harnesses</li> </ul>
			Press the UNLOCK button (transmitter)	B+→1.0 or less→B+→1.0 or less→B+	
			Other	B+	
4Q	Door switch signal (RH) output	Door switch	Door open (RH) (Door switch on)	1.0 or less	<ul style="list-style-type: none"> <li>Door switch (RH)</li> <li>Related wiring harnesses</li> </ul>
			Door closed (RH) (Door switch off)	B+	
4R	Unlock signal input	Door lock-link switch (passenger-side)	Passenger-side door is unlocked: Inspect for continuity to ground.	Continuity detected	Door lock-link switch (passenger-side)
			Passenger-side door is locked: Inspect for continuity to ground.	No continuity	
4S*2	Serial communication	Power window main switch	Because this terminal is for communication, good/no good judgment by terminal voltage is not possible.	-	<ul style="list-style-type: none"> <li>Power window main switch</li> <li>Related wiring harnesses</li> </ul>
4T	Door switch signal (LH) output	Door switch	Door open (LH) (Door switch on)	1.0 or less	<ul style="list-style-type: none"> <li>Door switch (LH)</li> <li>Related wiring harnesses</li> </ul>
			Door closed (LH) (Door switch off)	B+	
4U	Horn on/off	Horn relay	Other	B+	<ul style="list-style-type: none"> <li>Horn relay</li> <li>Related wiring harnesses</li> </ul>
			Transmitter LOCK button is pressed twice within 5 s.	B+→1.0 or less→B+	
4V	Hood switch signal	Hood switch	Hood open (Hood latch switch off)	B+	<ul style="list-style-type: none"> <li>Hood latch switch</li> <li>Related wiring harnesses</li> </ul>
			Hood closed (Hood latch switch on)	1.0 or less	
4Y	Keyless buzzer output	Keyless buzzer	Keyless buzzer operated	B+	Keyless buzzer
			Other	1.0 or less	
4Z	HS-CAN+	PCM	Under any condition: <ul style="list-style-type: none"> <li>Inspect for continuity to PCM.</li> <li>Inspect for continuity to instrument cluster.</li> </ul>	Continuity detected	-
			Under any condition:		

4AA	HS-CAN-	PCM	<div>Inspect for continuity to PCM.</div> <div><div>• Inspect for continuity to instrument cluster.</div></div>	Continuity detected	-
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- \*1

With immobilizer system
- \*2

With exterior open function (Power window system)

## 2008 - MX-5 - Body and Accessories

### CARD KEY ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]

#### CAUTION:

- Do not place the following devices in the vehicle while programming, otherwise programming cannot be performed.
  - M-MDS
  - Personal computer
  - Device that can send/receive radio waves
- Verify that the other transmitter is not being operated around the servicing area during card key programming.

#### NOTE:

- Use the M-MDS and start programming if the condition corresponds to the following:
  - One or No Programmed Card Keys
  - Keyless control module is replaced
- If six card keys are already programmed, the programming mode does not activate. If programming is needed, use the M-MDS to erase the unnecessary card key programming.

#### With two programmed card keys

1. Bring the programmed card keys (2) and a unprogrammed card key into the vehicle.
2. Close all doors.
3. Insert the supplementary key into the ignition key cylinder.

#### NOTE:

- Complete the procedures up to Step 7 within **30 s** after the supplementary key is inserted.
4. Turn the ignition switch to the ON position.
  5. Press the UNLOCK button on card key 1.
  6. Press the UNLOCK button on card key 2.
  7. From the ignition switch in the ON position, switch the ignition switch in the order indicated below.
    - ACC→ON→ACC→ON→ACC→ON
  8. Open the driver-side front door, press the door switch **twice**, and then close the door.

**NOTE:**

- After Step 3 is completed and the card key programming mode is activated, the door lock actuator operates to lock, and then operates to unlock.
- If the door lock actuator does not operate, repeat the procedure from Step 2.

9. Press the UNLOCK button on the unprogrammed card key **twice**.

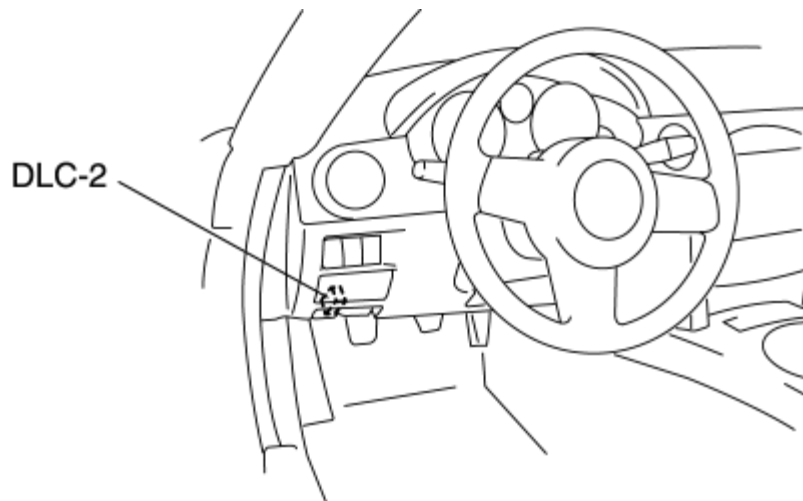
**NOTE:**

- After Step 8 is completed and the card key is programmed, the door lock actuator operates to lock, and then operates to unlock.

10. If programming more card keys, remove the supplementary key once, and then repeat the procedure from Step 2.

**Using M-MDS**

1. Fully lower the driver-side door glass.
2. Connect the M-MDS to the DLC-2.



3. Pull out the M-MDS cable from the door glass opening and set the M-MDS outside the vehicle.

**CAUTION:**

- Protect the cable and body contact area with a clean rag, otherwise they could be damaged.

4. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  - Select "BODY"
  - Select "SECURITY"
  - Select "PATS functions"
- When using the PDS (Pocket PC)

- Select "Programming".
- Select "PATS functions"

5. Then, select items from the screen menu in the following order.

- Select "Program Additional Card Key".

6. Security access begins and the M-MDS displays the "OUT-CODE".

**NOTE:**

- When "OUT-CODE" is first displayed, turning the ignition switch from the LOCK to the ON position **5 times** will change the "OUT-CODE".

7. Input the "IN-CODE" that corresponds to the "OUT-CODE " displayed on the M-MDS screen.

8. Select "CARD KEY PROGRAMMING" from the M-MDS screen menu.

**NOTE:**

- After Step 8 is completed and the card key programming is activated, the door lock actuator operates to lock, and then operates to unlock.

9. Press the unprogrammed card key UNLOCK button **twice**.

**NOTE:**

- After Step 9 is completed and the card key is programmed, the door lock actuator operates to lock, and then operates to unlock.

10. If programming more card keys, remove the supplementary key once, and then repeat the procedure from Step 7 by following the instructions on the M-MDS screen.

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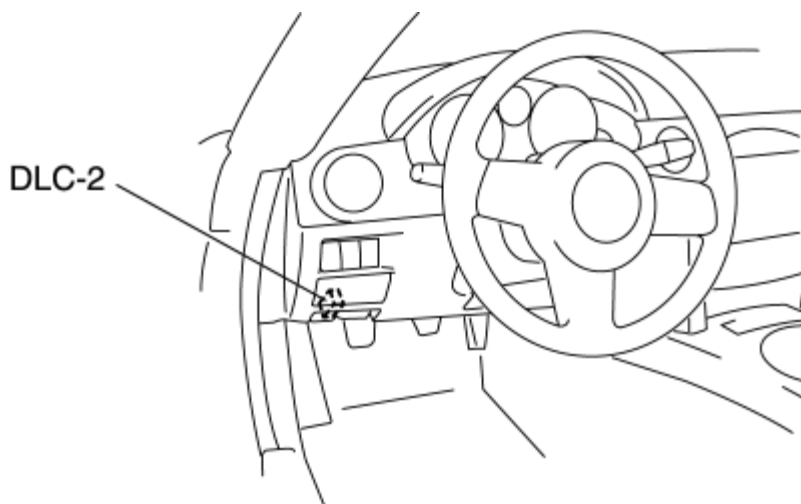
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## 2008 - MX-5 - Body and Accessories

### CLEARING CARD KEY [ADVANCED KEYLESS SYSTEM]

1. Fully lower the driver-side door glass.
2. Connect the M-MDS to the DLC-2.



3. Pull out the M-MDS cable from the door glass opening and set the M-MDS outside the vehicle.

#### CAUTION:

- Protect the cable and body contact area with a clean rag, otherwise they could be damaged.

4. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  - Select "BODY"
  - Select "SECURITY"
- When using the PDS (Pocket PC)
  - Select "Programming".

5. Then, select items from the screen menu in the following order.

- Select "PATS functions".
- Select "Card Key Code Erase and Program".

6. Security access begins and the M-MDS displays the "OUT-CODE".

#### NOTE:

- When "OUT-CODE" is first displayed, turning the ignition switch from the LOCK

to the ON position **5 times** will change the "OUT-CODE".

7. Input the "IN-CODE" that corresponds to the "OUT-CODE" displayed in the M-MDS screen.

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## 2008 - MX-5 - Body and Accessories

### STEERING LOCK UNIT ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]

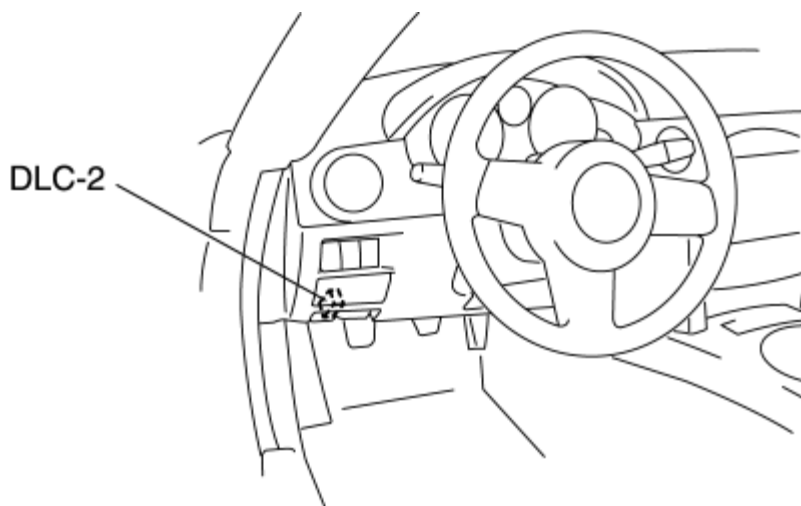
#### CAUTION:

- Do not place the following devices in the vehicle while programming, otherwise programming cannot be performed.
  - M-MDS
  - Personal computer
  - Device that can send/receive radio waves

#### NOTE:

- The steering lock unit and steering lock component are a single unit. Therefore, replace the steering lock component when replacing steering lock unit. (See [STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION](#).)
- For this procedure, a programmed card key is necessary. If there is no programmed card key, perform the steering lock unit programming after the card key programming.

1. Bring the programmed card key into the vehicle.
2. Fully lower the driver-side door glass.
3. Connect the M-MDS to the DLC-2.



4. Pull out the M-MDS cable from the door glass opening and set the M-MDS outside the vehicle.
5. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.
  - When using the IDS (laptop PC)
    - Select "BODY"

- Select "SECURITY"
- When using the PDS (Pocket PC)
  - Select "Programming".

6. Then, select items from the screen menu in the following order.

- a. Select "PATS Functions"
- b. Select "Steering Lock Unit Programming"

7. Perform the security access according to the directions on the M-MDS screen. (See **SECURITY ACCESS PROCEDURE[ADVANCED KEYLESS SYSTEM]**.)

8. The security access begins and the M-MDS displays "OUT-CODE".

**NOTE:**

- When "OUT-CODE" is first displayed, turning the ignition switch from the LOCK to the ON position **5 times** will change the "OUT-CODE".

9. Input the "IN-CODE" that corresponds to the "OUT-CODE" displayed on the M-MDS screen.

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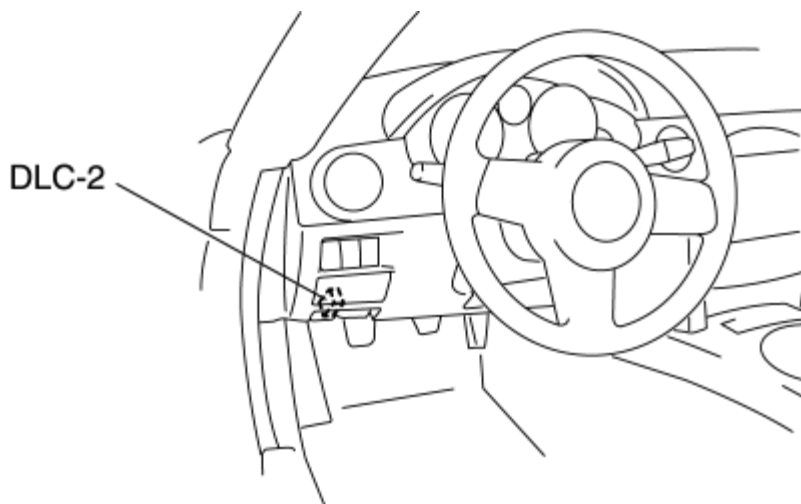
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## 2008 - MX-5 - Body and Accessories

### CUSTOMIZED FUNCTION SETTING PROCEDURE [ADVANCED KEYLESS SYSTEM]

1. Connect the M-MDS to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  - Select "Module Programming".
- When using the PDS (Pocket PC)
  - Select "Programming".
  - Select "Module programming".

3. Then, select items from the screen menu in the following order.

- Select "Programmable parameters".
- Select "RKE".

4. Select the item name, and then select either "ON/OFF".

#### Items

- Automatic Lock
- Answer Back Buzzer
- Card Key Battery Low Warning

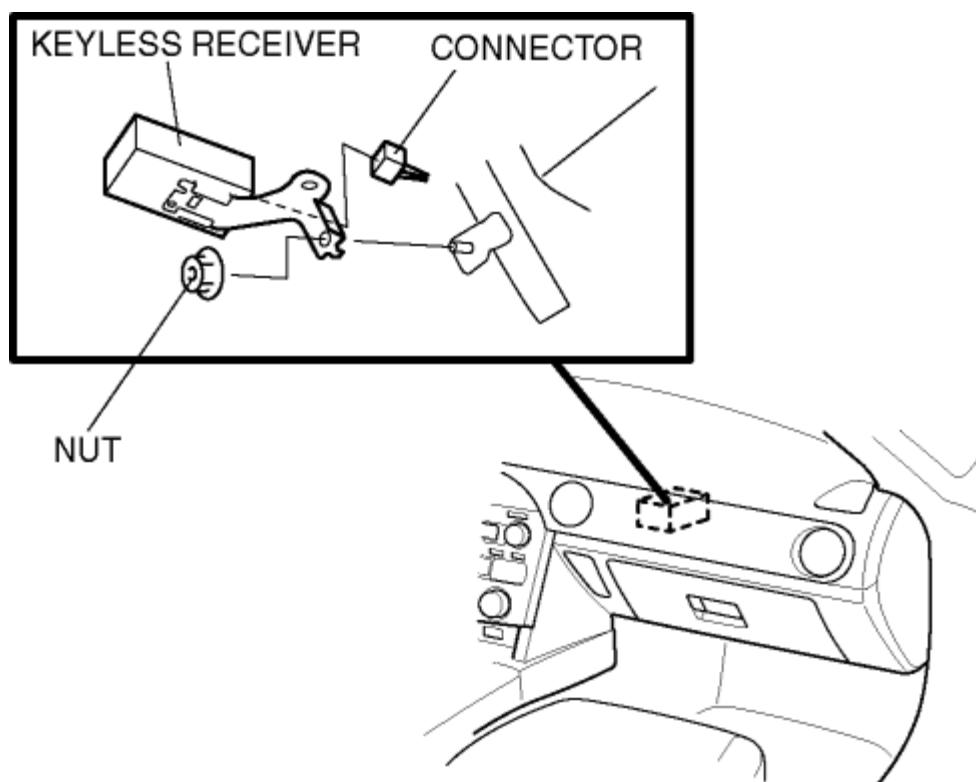


## 2008 - MX-5 - Body and Accessories

### KEYLESS RECEIVER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]

#### Front

1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
2. Remove the glove compartment lid. (See [GLOVE COMPARTMENT REMOVAL/INSTALLATION.](#))
3. Disconnect the keyless receiver module connector.
4. Remove the nut, then remove the keyless receiver (front).

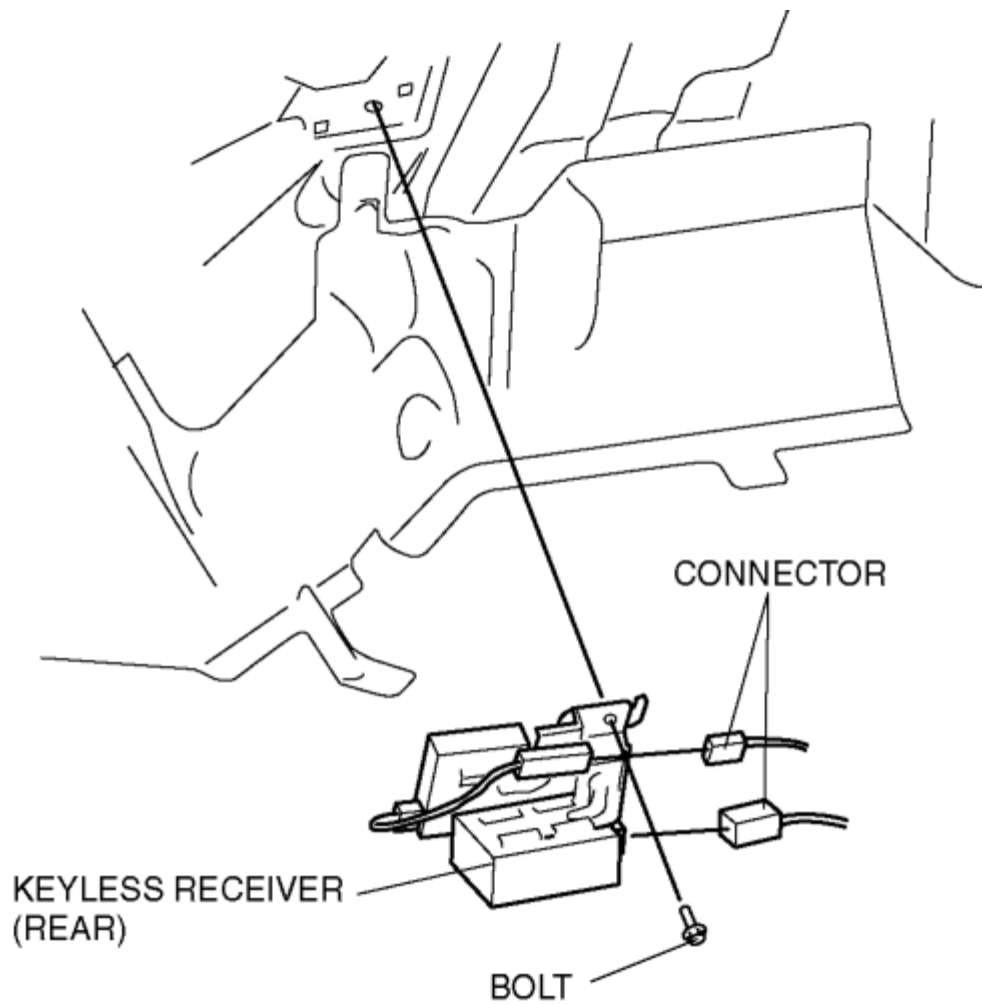


5. Install in the reverse order of removal.

#### Rear

1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
2. Remove the trunk side trim. (See [TRUNK SIDE TRIM REMOVAL/INSTALLATION.](#))
3. Remove the nuts.
4. Disconnect the connector.

5. Remove the keyless receiver (rear).



6. Install in the reverse order of removal.

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2008 - MX-5 - Body and Accessories

KEYLESS RECEIVER INSPECTION [ADVANCED KEYLESS SYSTEM]

1. Measure the voltage or inspect for continuity according to the Terminal Voltage Table (Reference).
- If the voltage is not as specified in the Terminal Voltage Table (Reference), inspect the parts under "Inspection item(s)" and related wiring harnesses.

Terminal Voltage Table (Reference)



Terminal	Signal name	Connected to	Measured condition	Voltage (V)/Continuity	Inspection item(s)
A	Power supply	Keyless control module	Under any condition	B+	<div><div></div><div>• Keyless control module</div><div>• Related wiring harnesses</div></div>
C	Data	Keyless control module	Under any condition: Inspect the wiring harness between the keyless receiver and keyless control module terminal 3U for continuity.	Continuity detected	<div><div></div><div>• Keyless control module</div><div>• Related wiring harnesses</div></div>
E	GND	Body ground	Under any condition: Inspect for continuity to ground.	Continuity detected	GND

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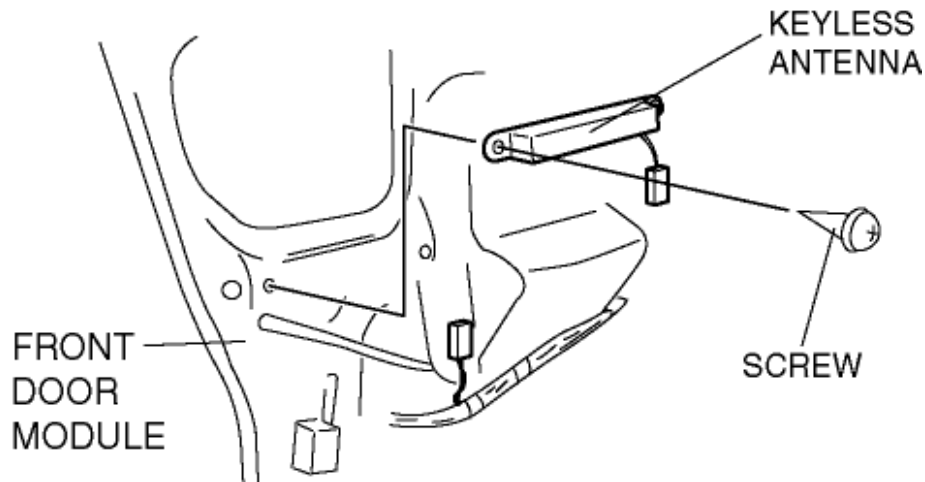
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## 2008 - MX-5 - Body and Accessories

### KEYLESS ANTENNA REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]

#### Driver-side/passenger-side Door

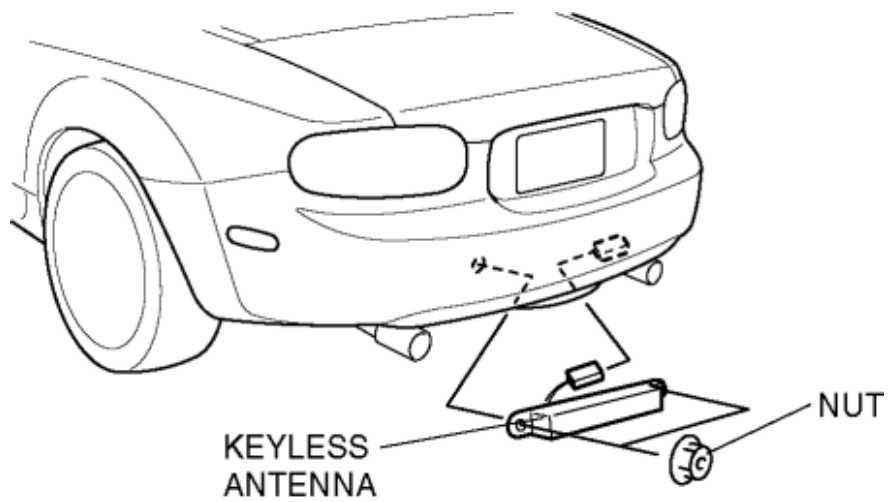
1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
2. Remove the door trim. (See [DOOR TRIM REMOVAL/INSTALLATION](#).)
3. Remove the screws.
4. Disconnect the connector, then remove the keyless antenna.



5. Install in the reverse order of removal.

#### Exterior, Rear

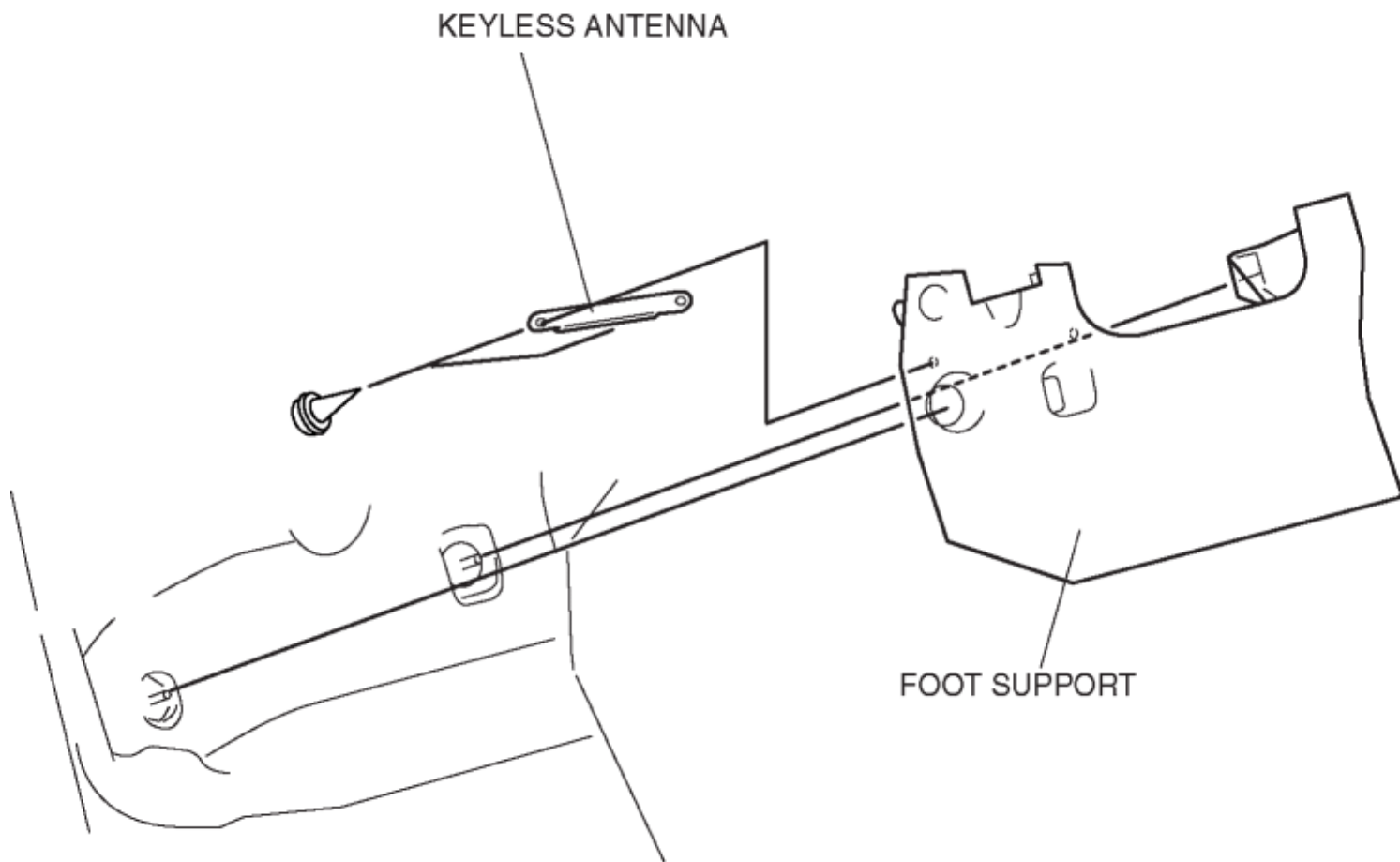
1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
2. Remove the nuts.
3. Disconnect the connector, then remove the keyless antenna.



4. Install in the reverse order of removal.

### Interior, Front

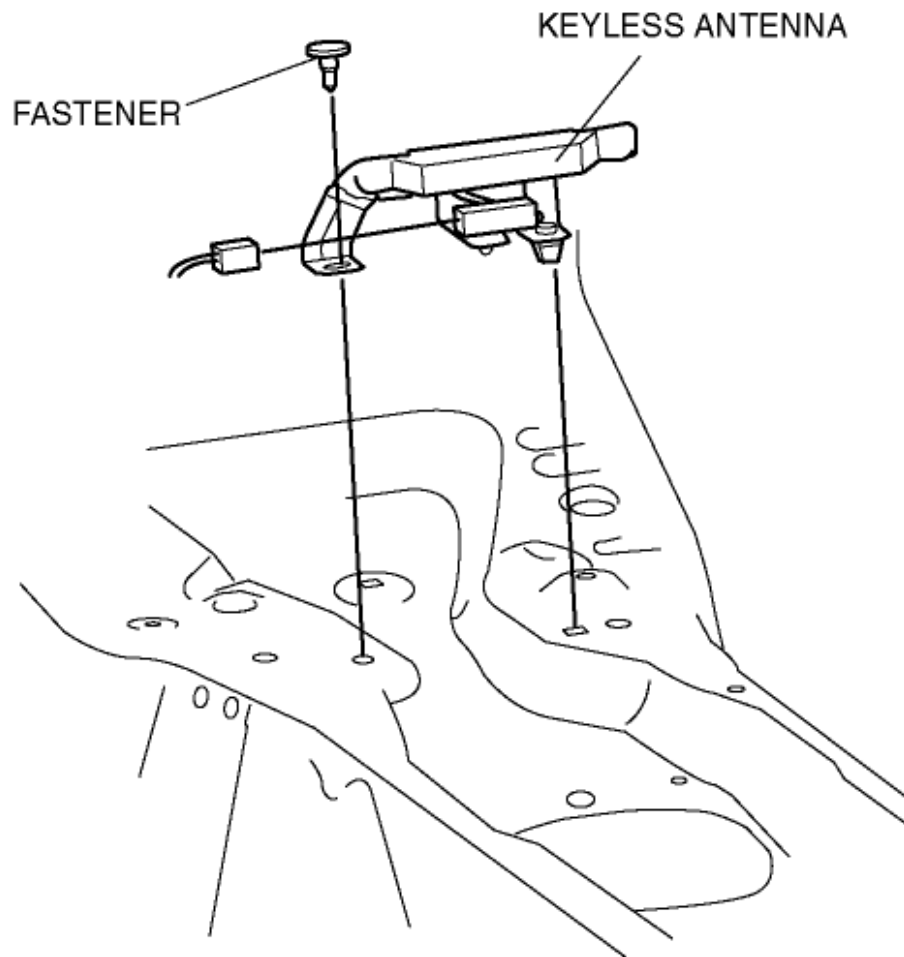
1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
2. Remove the scuff plate. (See [SCUFF PLATE REMOVAL/INSTALLATION](#).)
3. Remove the side panel. (See [SIDE PANEL REMOVAL/INSTALLATION](#).)
4. Partially peel back the floor covering so that the foot support can be removed.
5. Remove the foot support.
6. Disconnect the connector, then remove the screws.
7. Remove the keyless antenna.



8. Install in the reverse order of removal.

### Interior, Middle

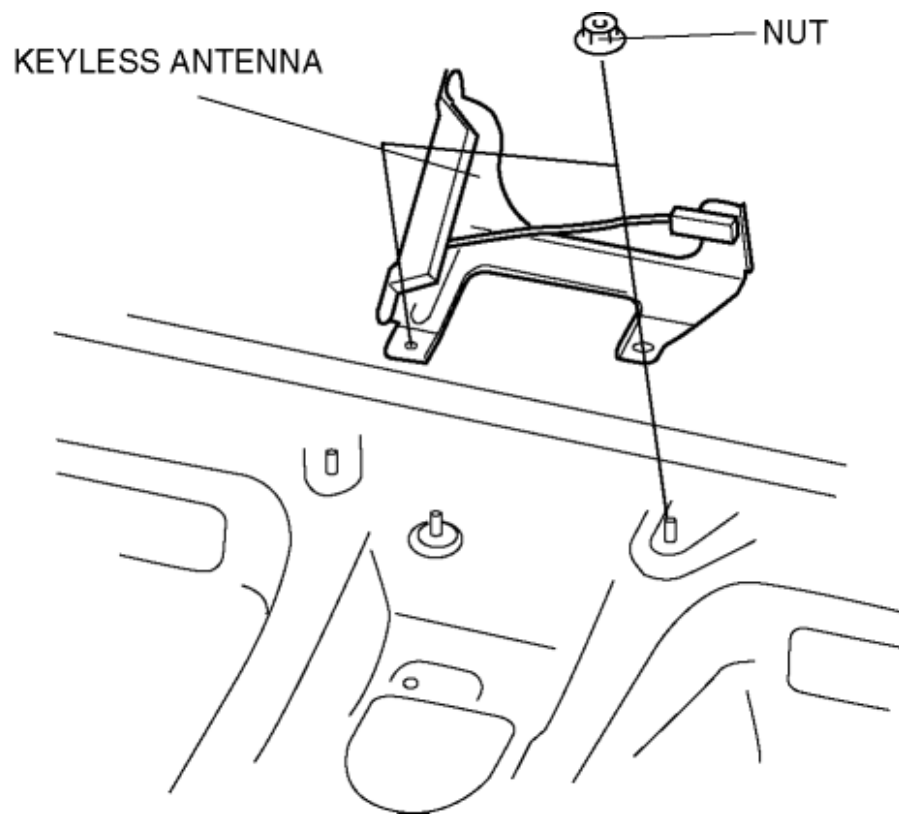
1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
2. Remove the console. (See [CONSOLE REMOVAL/INSTALLATION](#).)
3. Remove the side wall. (See [SIDE WALL REMOVAL/INSTALLATION](#).)
4. Remove the console panel. (See [CONSOLE PANEL REMOVAL/INSTALLATION](#).)
5. Remove the clips.
6. Disconnect the connector, then remove the keyless antenna.



7. Install in the reverse order of removal.

## Interior, Rear

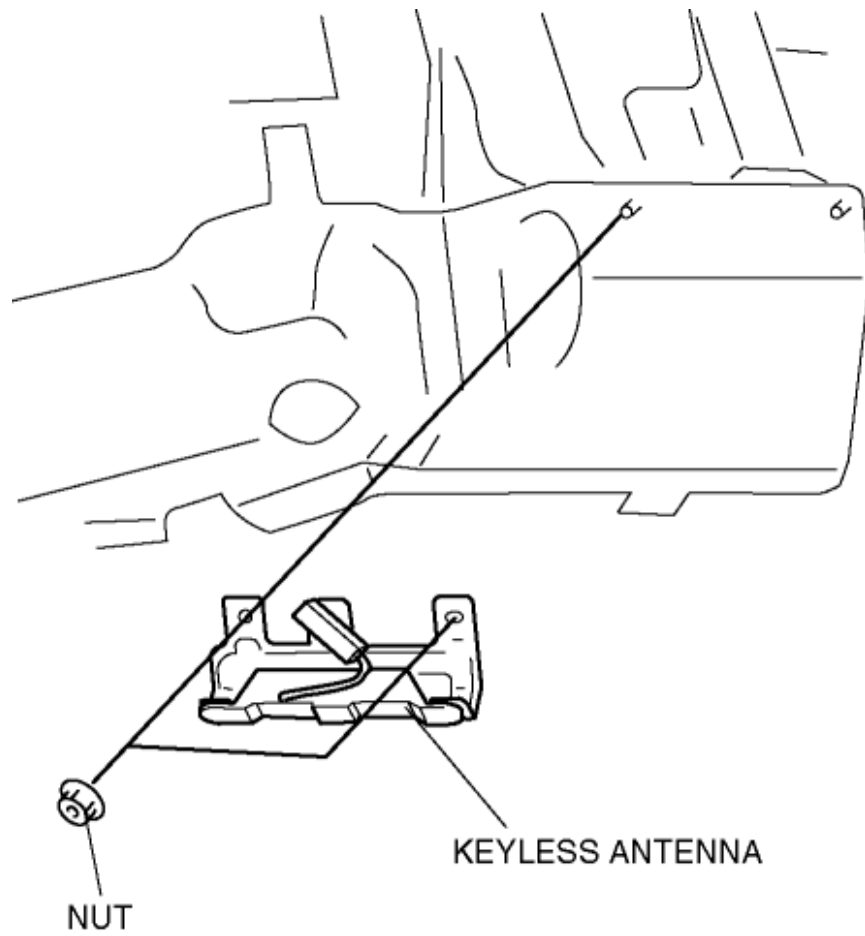
1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
2. Remove the console. (See [CONSOLE REMOVAL/INSTALLATION.](#))
3. Remove the back trim. (See [BACK TRIM REMOVAL/INSTALLATION.](#))
4. Remove the nuts.
5. Disconnect the connector, then remove the keyless antenna.



6. Install in the reverse order of removal.

### **Interior, trunk**

1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
2. Remove the trunk side trim. (See [TRUNK SIDE TRIM REMOVAL/INSTALLATION](#).)
3. Remove the nuts.
4. Disconnect the connector, then remove the keyless antenna.



5. Install in the reverse order of removal.

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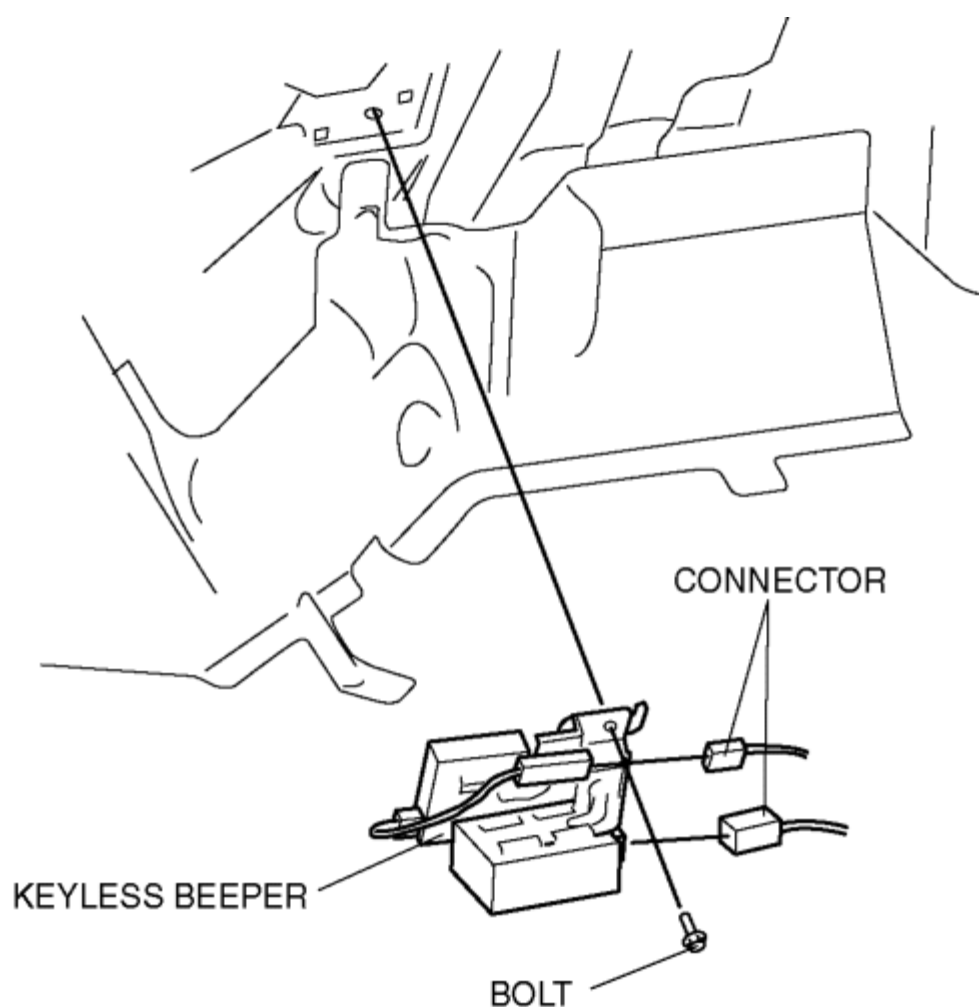
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## 2008 - MX-5 - Body and Accessories

### KEYLESS BEEPER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]

1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
2. Remove the trunk side trim. (See [TRUNK SIDE TRIM REMOVAL/INSTALLATION.](#))
3. Remove the nuts.
4. Disconnect the connector.
5. Remove the keyless beeper.



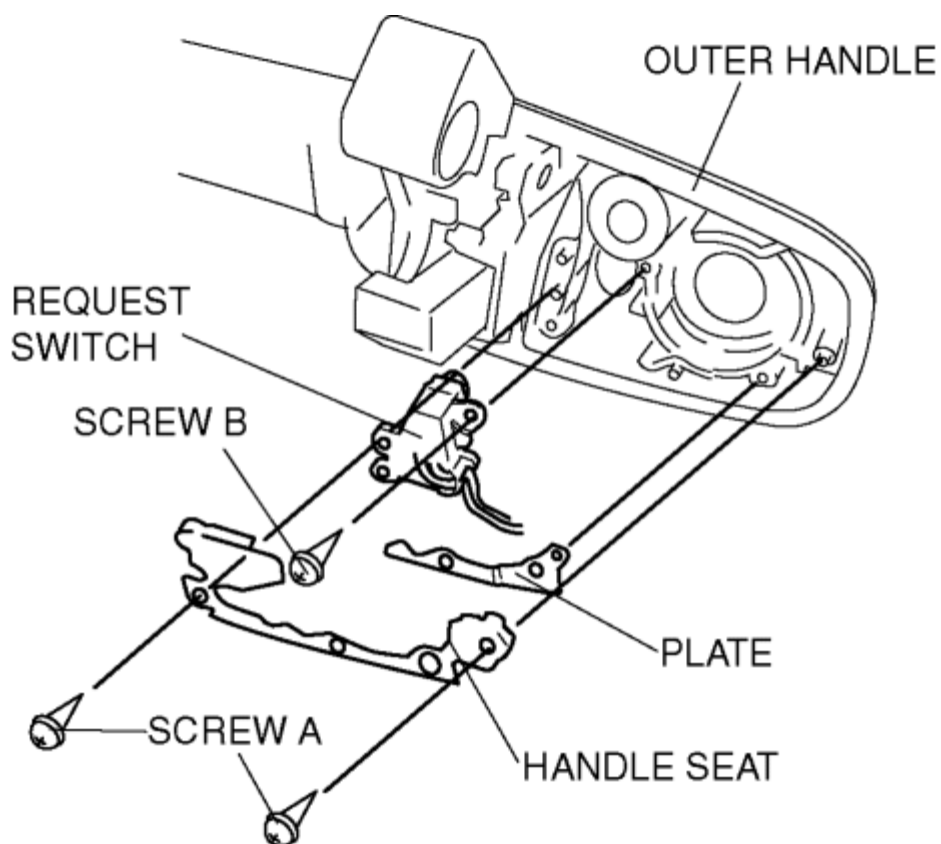
6. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### REQUEST SWITCH REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]

#### Deiver-side/passenger-side

1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
2. Remove the door trim. (See [DOOR TRIM REMOVAL/INSTALLATION](#).)
3. Remove the outer handle. (See [OUTER HANDLE REMOVAL/INSTALLATION \[ADVANCED KEYLESS SYSTEM\]](#).)
4. Remove the screws A, then remove the handle seat and plate.
5. Remove screw B, then remove the request switch.

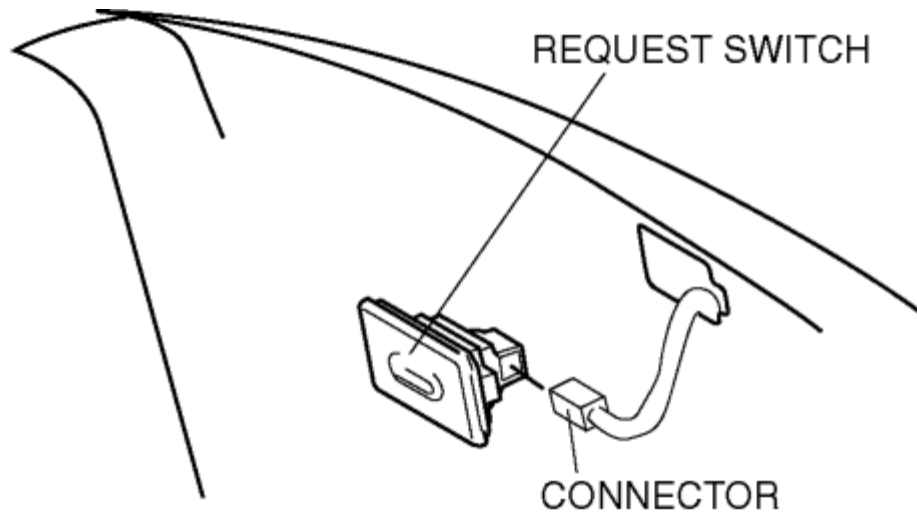


6. Install in the reverse order of removal.

#### Trunk Lid

1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)

2. Open the trunk lid.
3. Remove the request switch.



4. Install in the reverse order of removal.

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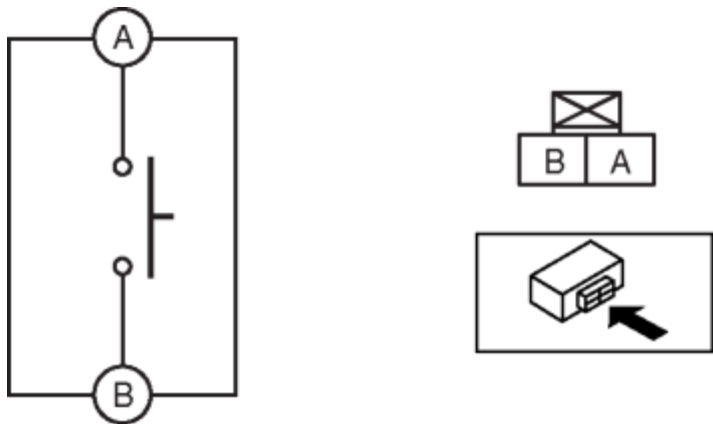
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2008 - MX-5 - Body and Accessories

REQUEST SWITCH INSPECTION [ADVANCED KEYLESS SYSTEM]

1. Inspect for continuity between request switch terminals A and B.



- If not as specified, replace the request switch.

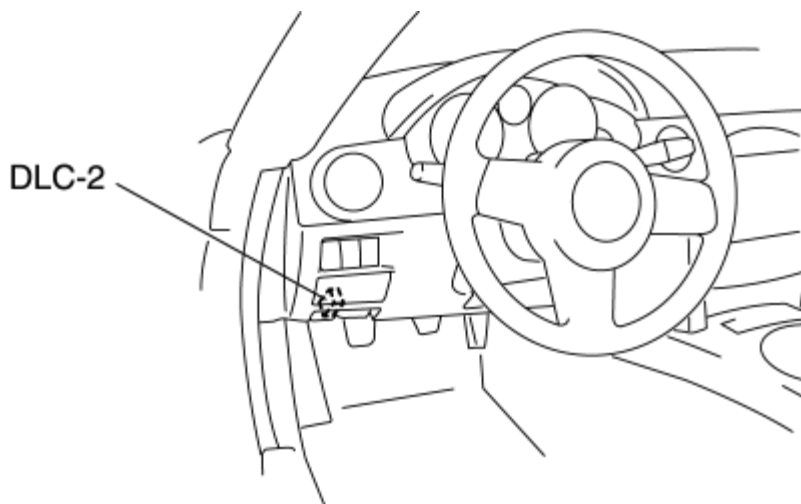
○ — ○ : Continuity

Switch position	Terminal	
	A	B
Push (ON)	○ —	— ○
Not push (OFF)		

## 2008 - MX-5 - Body and Accessories

### SECURITY ACCESS PROCEDURE [ADVANCED KEYLESS SYSTEM]

1. Connect the M-MDS to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  1. Select "Body".
  2. Select "Security".
- When using the PDS (Pocket PC)
  1. Select "Programming".
  2. Select "PATs Functions".

3. Select the items to be performed from the following:

- Program Additional card key
- Card Key Code Erase and Program
- Steering Lock Unit Programming
- Program additional ignition key (with immobilizer system)
- Ignition Key Code Erase and Program (with immobilizer system)
- Customer Spare Key Programming Enable (with immobilizer system)
- Customer Spare Key Programming Disable (with immobilizer system)

4. The security access begins and the M-MDS displays the "OUT-CODE".

#### NOTE:

- When "OUT-CODE" is first displayed, turning the ignition switch from the LOCK to the ON position **5 times** will change the "OUT-CODE".

5. Input "IN-CODE" corresponding to "OUT-CODE" displayed on the M-MDS screen.

6. If the security access is successful, selected item can be performed.

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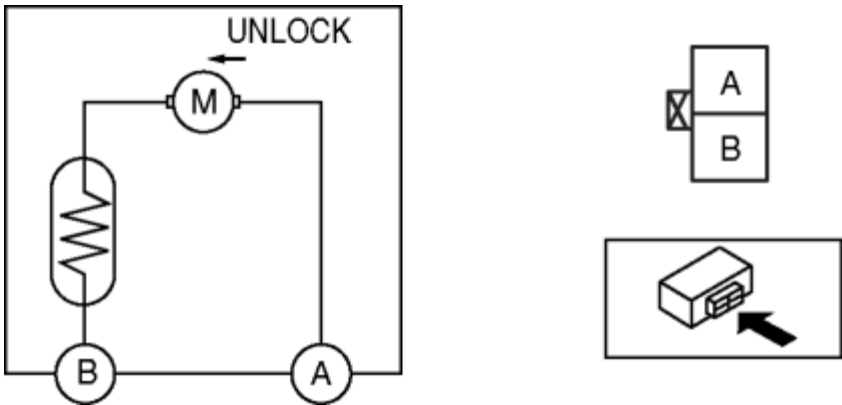
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2008 - MX-5 - Body and Accessories

TRUNK LID OPENER INSPECTION [ADVANCED KEYLESS SYSTEM]

1. Apply battery positive voltage and connect the ground to the corresponding the trunk lid opener terminals, and inspect the trunk lid opener operation.

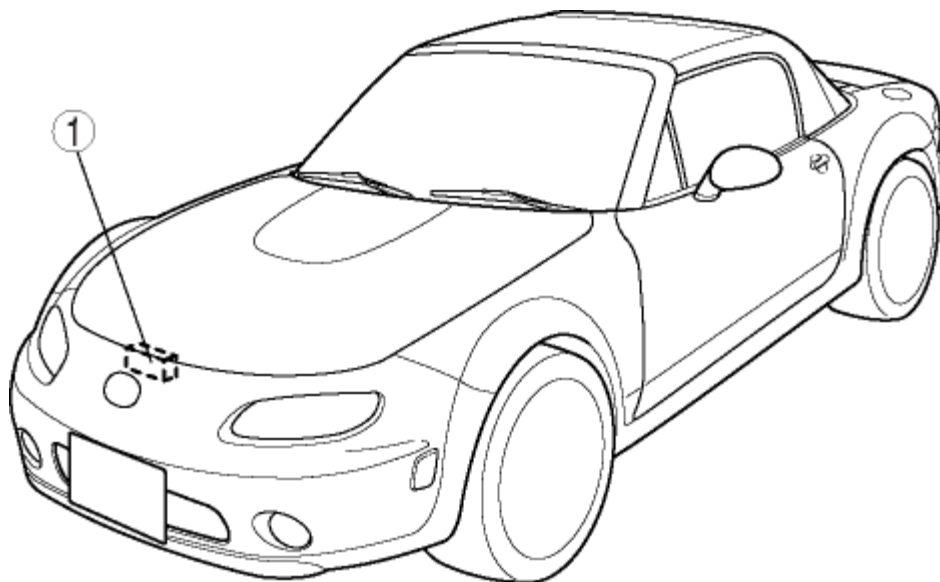


- If the trunk lid opener does not operate as indicated in the table, replace the trunk lid opener.

Operation	Terminal	
	A	B
Unlocks	B+	Ground

## 2008 - MX-5 - Body and Accessories

### THEFT-DETERRENT SYSTEM LOCATION INDEX [ADVANCED KEYLESS SYSTEM]



1 Hood latch

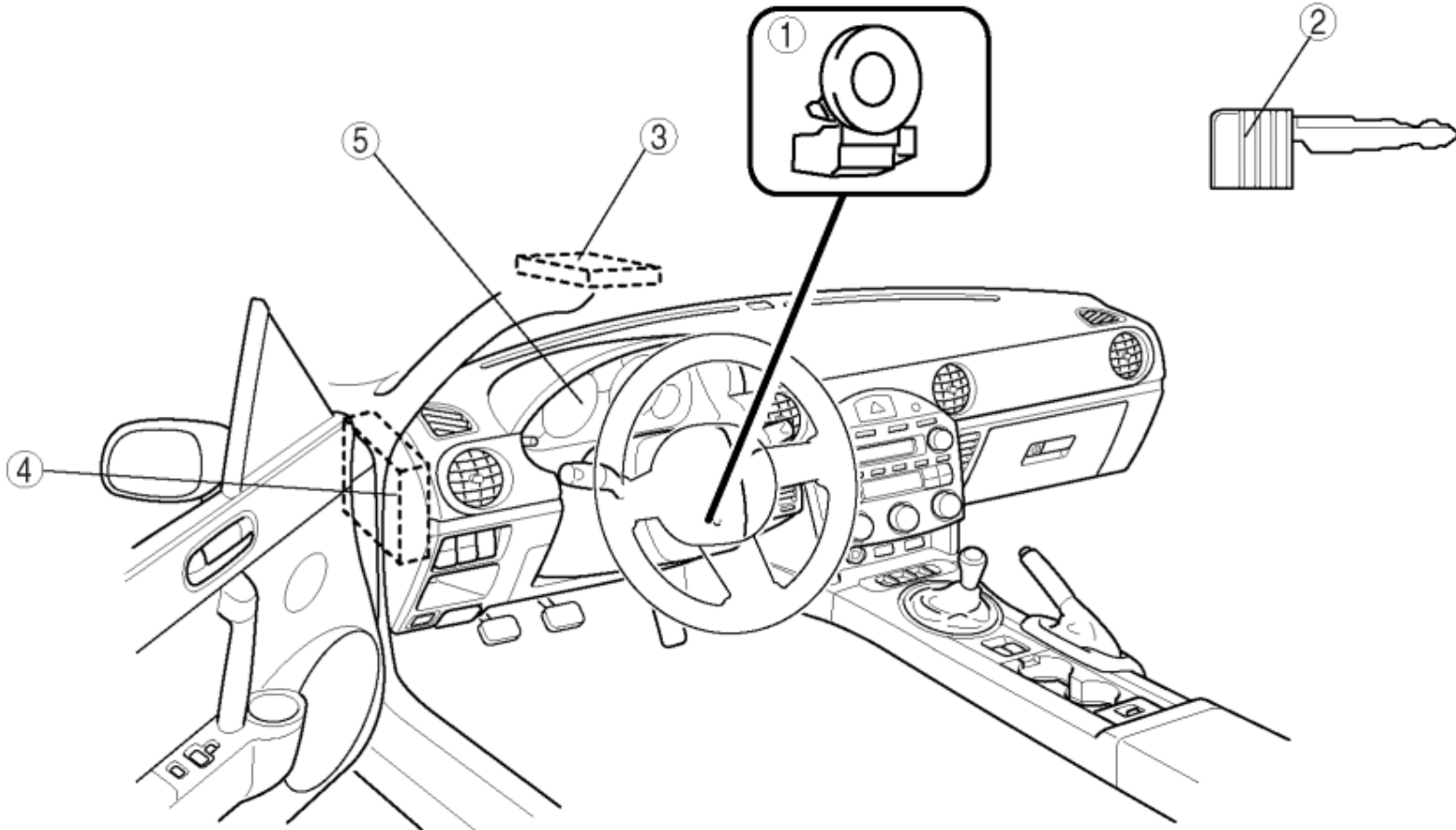
(See [HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION \[ADVANCED KEYLESS SYSTEM\]](#))

(See [HOOD LATCH SWITCH INSPECTION \[ADVANCED KEYLESS SYSTEM\]](#))



## 2008 - MX-5 - Body and Accessories

### IMMOBILIZER SYSTEM LOCATION INDEX [ADVANCED KEYLESS SYSTEM]



1	Coil antenna (See <a href="#">COIL ANTENNA REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> )
2	Key (transponder) (See <a href="#">IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</a> )
3	PCM (See <a href="#">IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</a> )
4	Keyless control module (See <a href="#">IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]</a> )

5 Instrument cluster

(See **IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]**)

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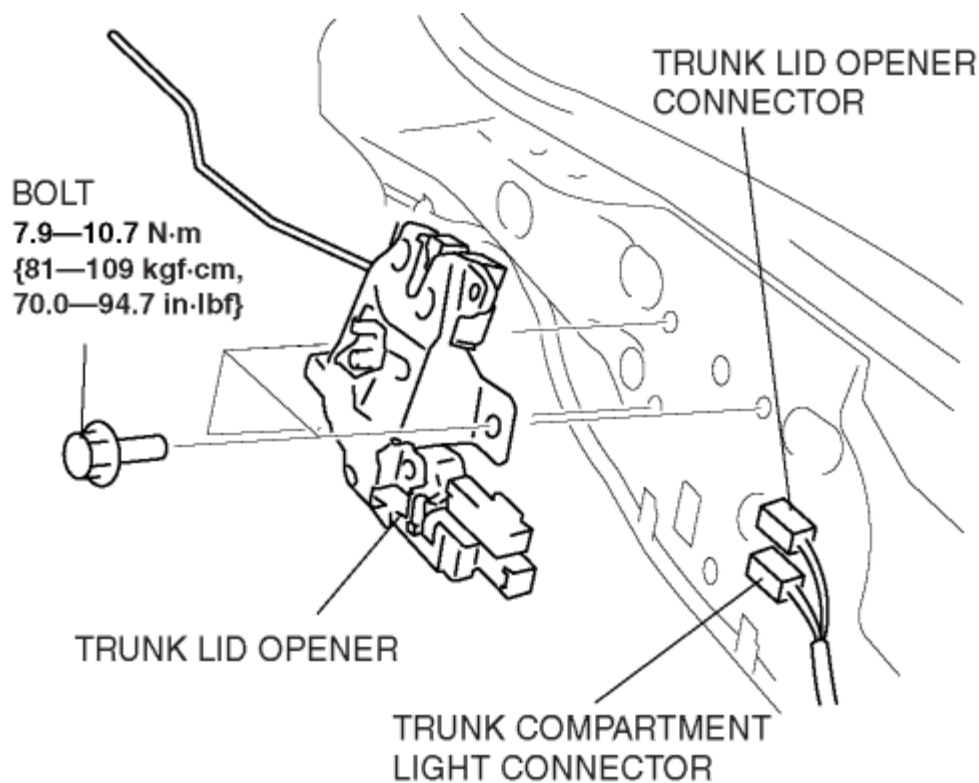
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## 2008 - MX-5 - Body and Accessories

### TRUNK LID OPENER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]

1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
2. Remove the trunk end trim. (See [TRUNK END TRIM REMOVAL/INSTALLATION.](#))
3. Detach the rod.
4. Disconnect the trunk lid opener connector and the trunk compartment light connector.

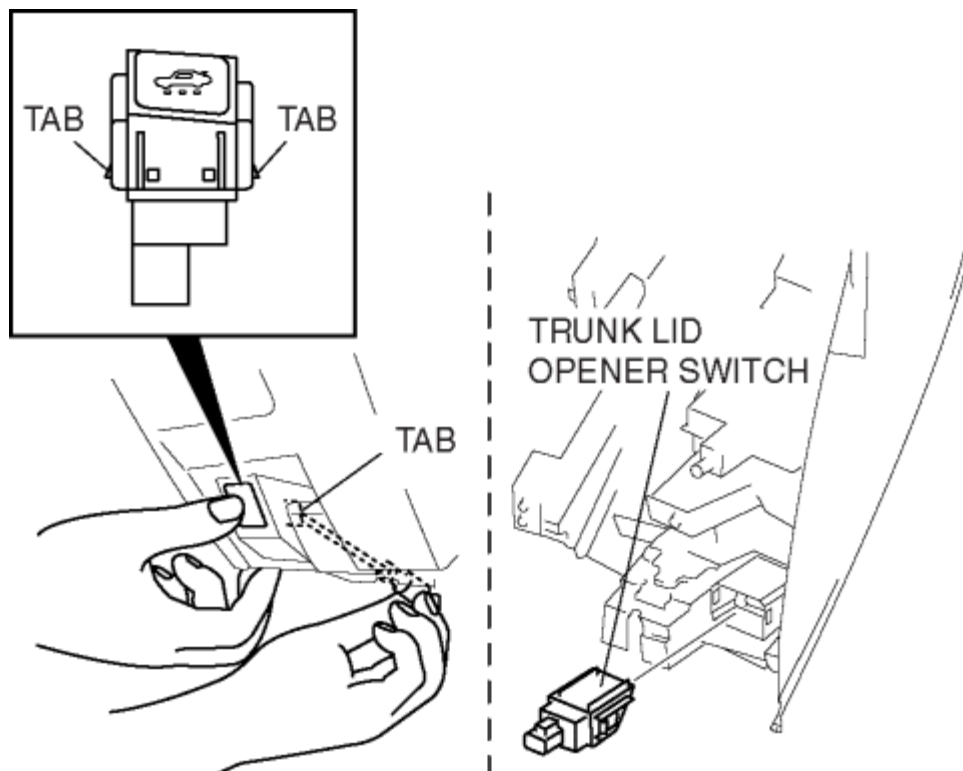


5. Remove the bolts, then remove the trunk lid opener.
6. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### TRUNK LID OPENER SWITCH REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]

1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
2. Using a small flathead screwdriver, detach the tabs of the trunk lid opener switch from the dashboard.

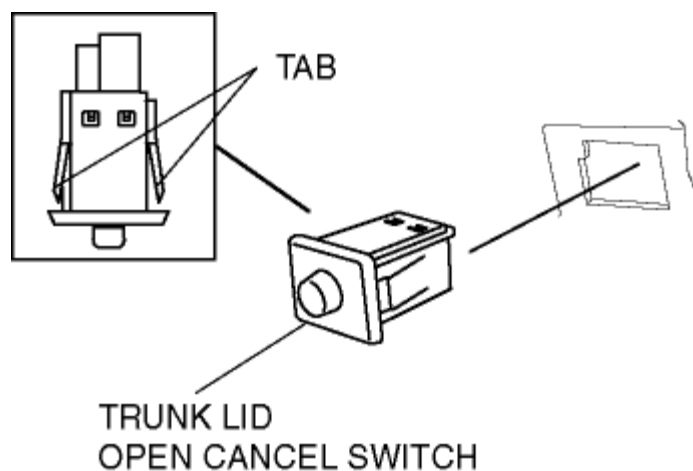


3. Push the trunk lid opener switch into the dashboard and remove.
4. Disconnect the trunk lid opener switch connector.
5. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### TRUNK LID OPEN CANCEL SWITCH REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]

1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
2. Remove the trunk end trim. (See [TRUNK END TRIM REMOVAL/INSTALLATION](#).)
3. Squeeze the tabs of the trunk lid open cancel switch and pull it forward to remove it.

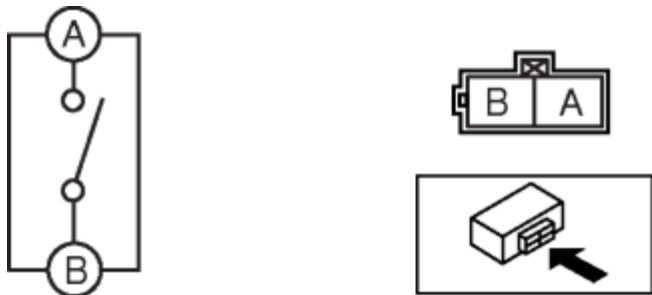


4. Disconnect the trunk lid open cancel switch connector.
5. Remove the trunk lid open cancel switch.
6. Install in the reverse order of removal.

2008 - MX-5 - Body and Accessories

TRUNK LID OPEN CANCEL SWITCH INSPECTION [ADVANCED KEYLESS SYSTEM]

- 1. Remove the trunk lid open cancel switch.
- 2. Inspect for continuity between the trunk lid open cancel switch terminals.



- If not as specified, replace the trunk lid open cancel switch.

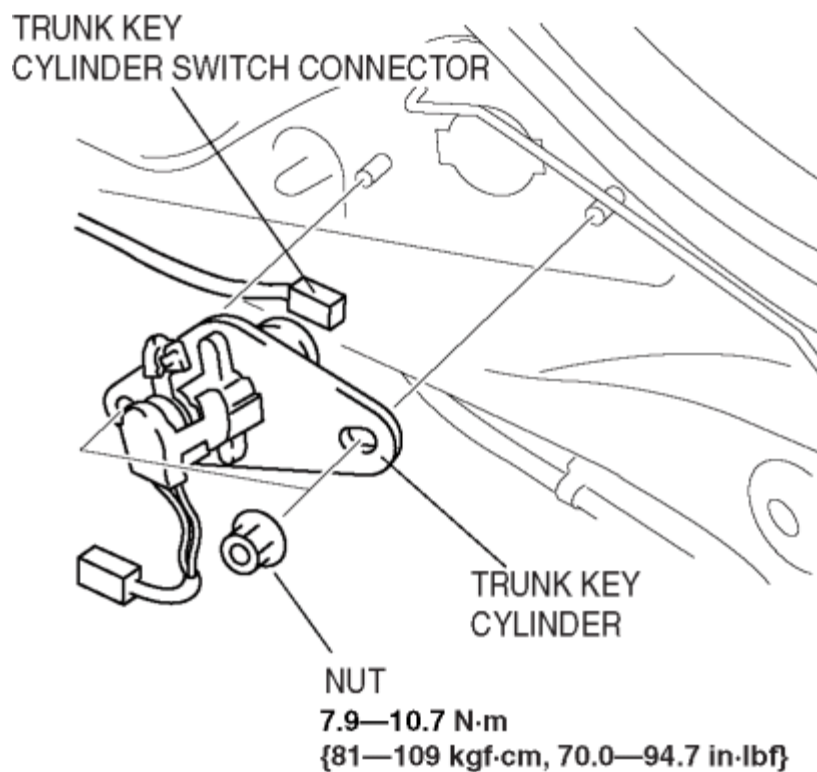
○ — ○ : Continuity

Operation	Terminal	
	A	B
On	○ —	○
Off		

## 2008 - MX-5 - Body and Accessories

### TRUNK KEY CYLINDER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]

1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
2. Remove the trunk end trim. (See [TRUNK END TRIM REMOVAL/INSTALLATION](#).)
3. Detach the rod.
4. Remove the nuts, then remove the trunk key cylinder.

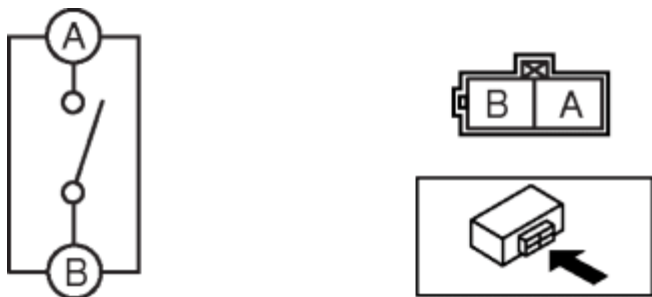


5. Install in the reverse order of removal.

2008 - MX-5 - Body and Accessories

TRUNK KEY CYLINDER SWITCH INSPECTION [ADVANCED KEYLESS SYSTEM]

- 1. Remove the trunk key cylinder switch.
- 2. Inspect for continuity between the trunk key cylinder switch terminals.



- If not as specified, replace the trunk key cylinder.

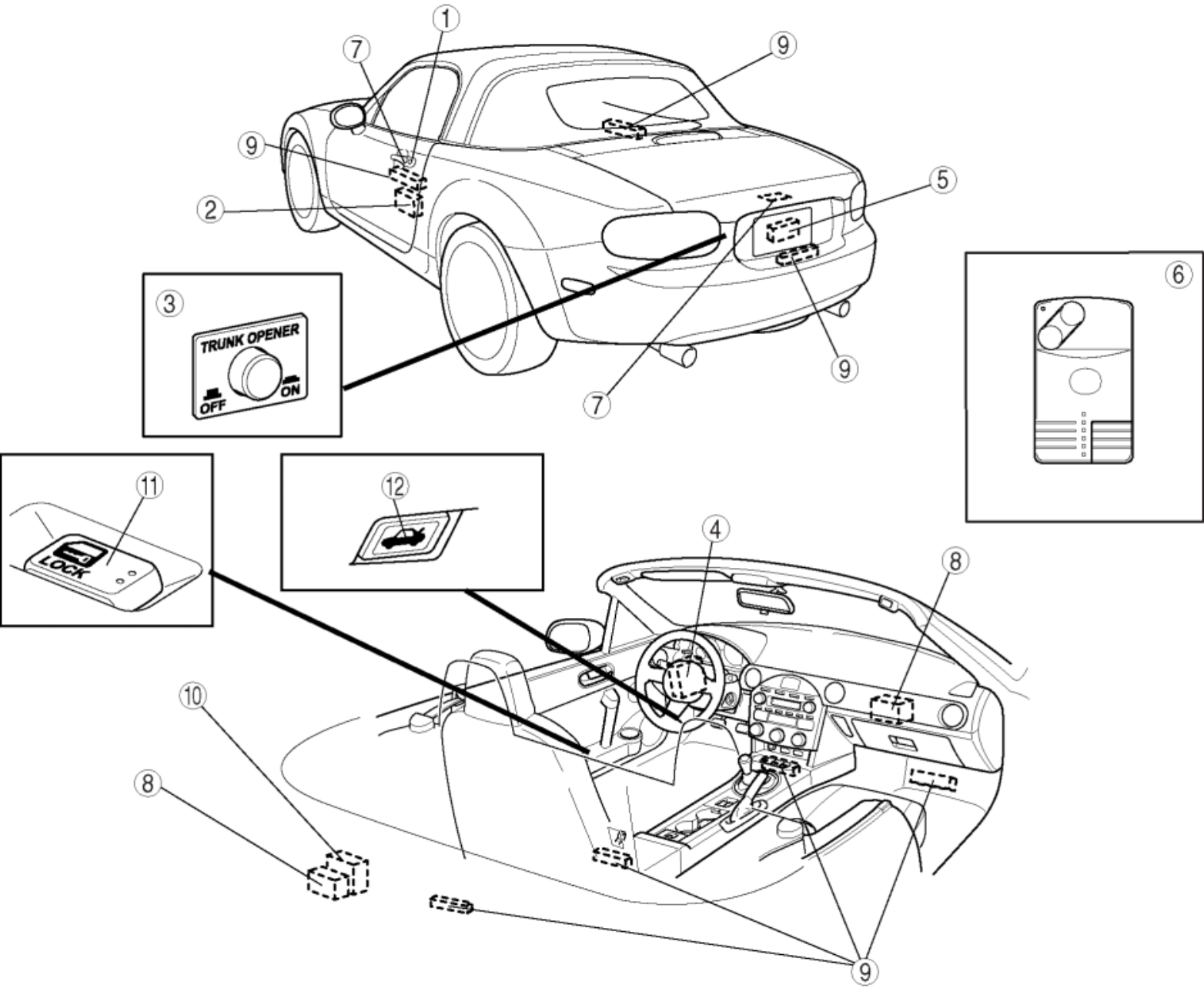
○ — ○ : Continuity

Operation	Terminal	
	A	B
On	○ — ○	○ — ○
Off		



2008 - MX-5 - Body and Accessories

POWER DOOR LOCK SYSTEM AND KEYLESS ENTRY SYSTEM LOCATION INDEX [ADVANCED KEYLESS SYSTEM]



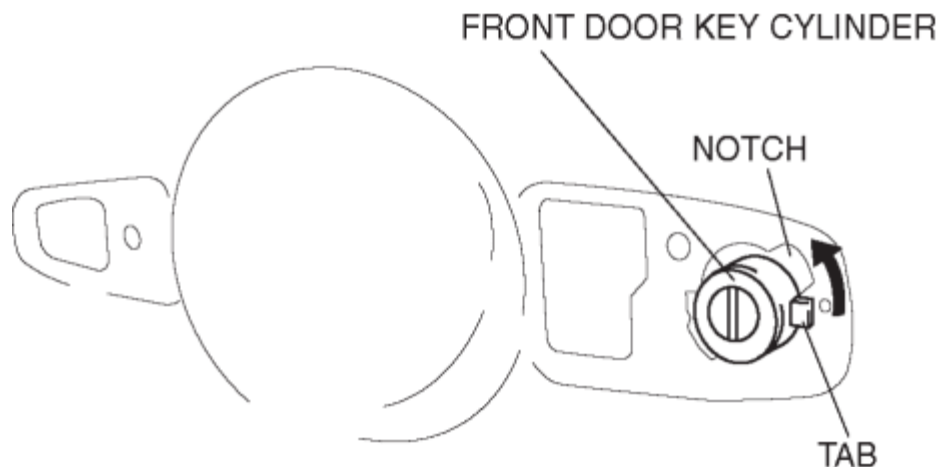
1	Door key cylinder (See <a href="#">DOOR KEY CYLINDER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> )
2	Door latch and lock actuator (See <a href="#">DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> ) (See <a href="#">DOOR LOCK ACTUATOR INSPECTION [ADVANCED KEYLESS SYSTEM]</a> )

3	Trunk lid opener cancel switch  (See <a href="#">TRUNK LID OPEN CANCEL SWITCH REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> )  (See <a href="#">TRUNK LID OPEN CANCEL SWITCH INSPECTION [ADVANCED KEYLESS SYSTEM]</a> )
4	Keyless control module  (See <a href="#">KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> )  (See <a href="#">KEYLESS CONTROL MODULE INSPECTION [ADVANCED KEYLESS SYSTEM]</a> )  (See <a href="#">STEERING LOCK UNIT ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a> )  (See <a href="#">KEYLESS CONTROL MODULE CONFIGURATION [ADVANCED KEYLESS SYSTEM]</a> )
5	Trunk lid latch and opener  (See <a href="#">TRUNK LID STRIKER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> )  (See <a href="#">TRUNK LID OPENER INSPECTION [ADVANCED KEYLESS SYSTEM]</a> )
6	Card key (transmitter)  (See <a href="#">CARD KEY BATTERY REPLACEMENT [ADVANCED KEYLESS SYSTEM]</a> )  (See <a href="#">CARD KEY ID CODE REGISTRATION [ADVANCED KEYLESS SYSTEM]</a> )
7	Request switch  (See <a href="#">REQUEST SWITCH REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> )  (See <a href="#">REQUEST SWITCH INSPECTION [ADVANCED KEYLESS SYSTEM]</a> )
8	Keyless receiver  (See <a href="#">KEYLESS RECEIVER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> )  (See <a href="#">KEYLESS RECEIVER INSPECTION [ADVANCED KEYLESS SYSTEM]</a> )
9	Keyless antenna  (See <a href="#">KEYLESS ANTENNA REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> )
10	Keyless beeper  (See <a href="#">KEYLESS BEEPER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> )
11	Door lock switch  (See <a href="#">DOOR LOCK SWITCH REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> )  (See <a href="#">DOOR LOCK SWITCH INSPECTION [ADVANCED KEYLESS SYSTEM]</a> )
12	Trunk lid opener switch  (See <a href="#">TRUNK LID OPENER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> )  (See <a href="#">TRUNK LID OPENER SWITCH INSPECTION [ADVANCED KEYLESS SYSTEM]</a> )

## 2008 - MX-5 - Body and Accessories

### DOOR KEY CYLINDER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]

1. Remove the following parts:
  - a. Door trim (See [DOOR TRIM REMOVAL/INSTALLATION.](#))
  - b. Door glass (See [DOOR GLASS REMOVAL/INSTALLATION.](#))
  - c. Door speaker (See [DOOR SPEAKER REMOVAL/INSTALLATION.](#))
  - d. Door unit (See [DOOR UNIT REMOVAL/INSTALLATION.](#))
  - e. Outer handle (See [OUTER HANDLE REMOVAL/INSTALLATION \[ADVANCED KEYLESS SYSTEM\].](#))
2. Detach the door key cylinder rod.
3. Turn the door key cylinder so that the tab is aligned with the notch.

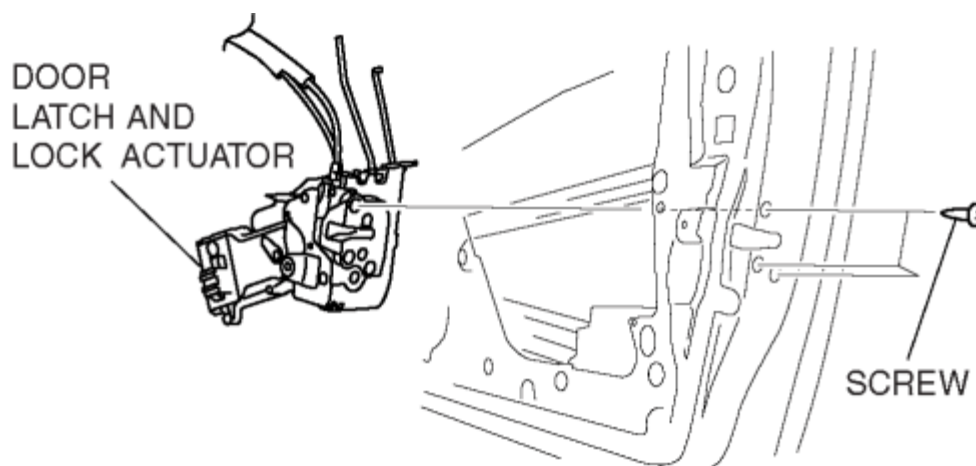


4. Remove the door key cylinder by pulling it out from the front door.
5. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]

1. Remove the following parts:
  - a. Door trim (See [DOOR TRIM REMOVAL/INSTALLATION.](#))
  - b. Door glass (See [DOOR GLASS REMOVAL/INSTALLATION.](#))
  - c. Door speaker (See [DOOR SPEAKER REMOVAL/INSTALLATION.](#))
  - d. Door unit (See [DOOR UNIT REMOVAL/INSTALLATION.](#))
2. Detach the cables from the inner handle and the door lock knob.
3. Detach the rods from the key cylinder and the outer handle.
4. Remove the screws, then remove the door latch and lock actuator.



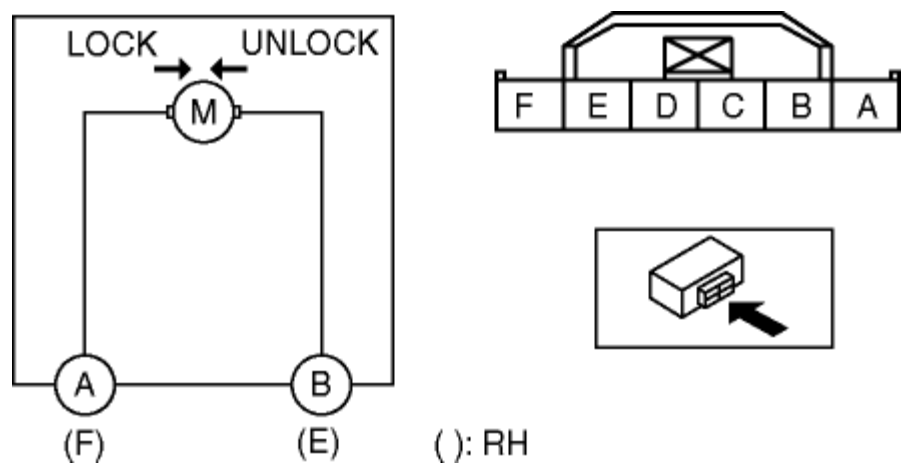
5. Install in the reverse order of removal.

2008 - MX-5 - Body and Accessories

DOOR LOCK ACTUATOR INSPECTION [ADVANCED KEYLESS SYSTEM]

Door Lock Actuator

- 1. Disconnect the door lock actuator connector.
- 2. Apply battery positive voltage and connect the ground to the corresponding door lock actuator terminals and inspect the door lock actuator operation.



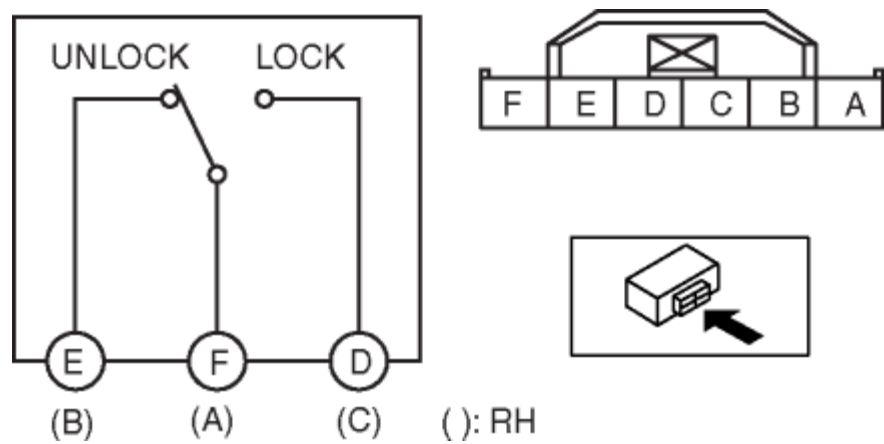
- If not as specified, replace the door lock actuator.

Actuator operation	Connection	
	B+	GND
Lock	A (F)	B (E)
Unlock	B (E)	A (F)

( )  
RH

Door Lock-link Switch

- 1. Disconnect the door lock actuator connector.
- 2. Inspect for continuity between the door lock-link switch terminals.



- If not as specified, replace the door lock actuator.

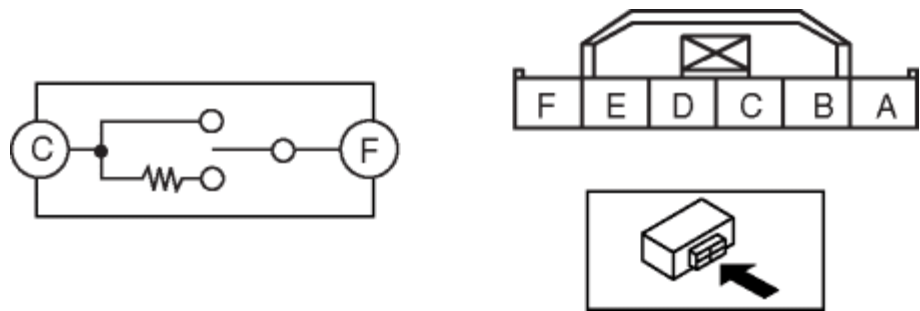
○—○ : Continuity

Lock knob position	Terminal		
	E (B)	F (A)	D (C)
Lock		○—○	
Unlock	○—○		

( ): RH


Door Key Cylinder Switch

- 1. Disconnect the door lock actuator connector.
- 2. Inspect for continuity between the door lock-link switch terminals.



- If not as specified, replace the door lock actuator.

○—○ : Continuity    ○○ : Resistance

Key cylinder position	Terminal	
	C	F
Neutral		
Lock	○—  —○	
Unlock	○—○	

R

R: 950—1050  $\Omega$

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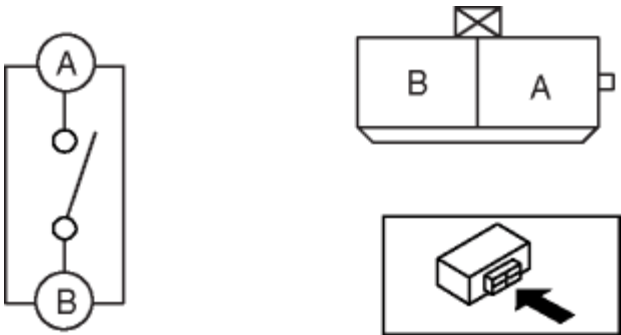
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2008 - MX-5 - Body and Accessories

TRUNK LID OPENER SWITCH INSPECTION [ADVANCED KEYLESS SYSTEM]

- 1. Remove the trunk lid open switch.
- 2. Inspect for continuity between the trunk lid open switch terminals.



- If not as specified, replace the trunk lid open switch.

○ — ○ : Continuity

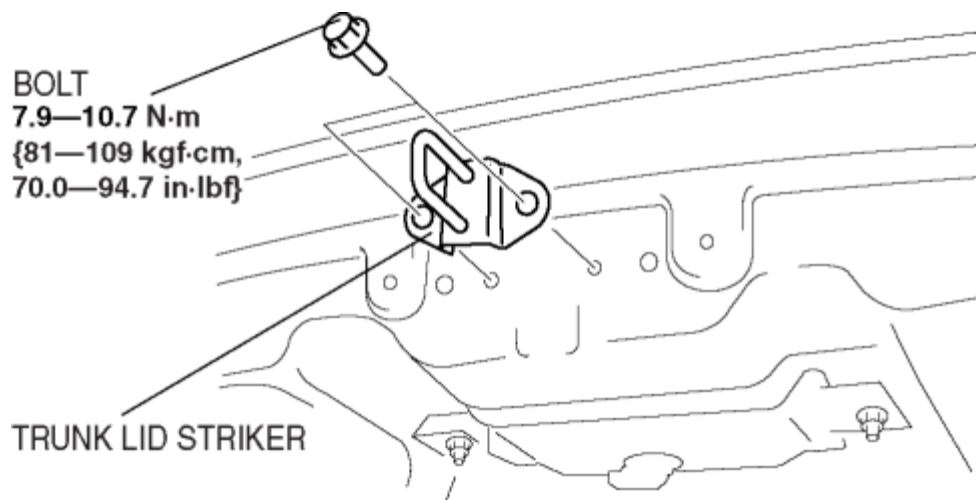
Operation	Terminal	
	A	B
On	○ —	— ○



## 2008 - MX-5 - Body and Accessories

### TRUNK LID STRIKER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]

1. Remove the trunk end trim. (See [TRUNK END TRIM REMOVAL/INSTALLATION](#).)
2. Remove the bolts, then remove the trunk lid striker.

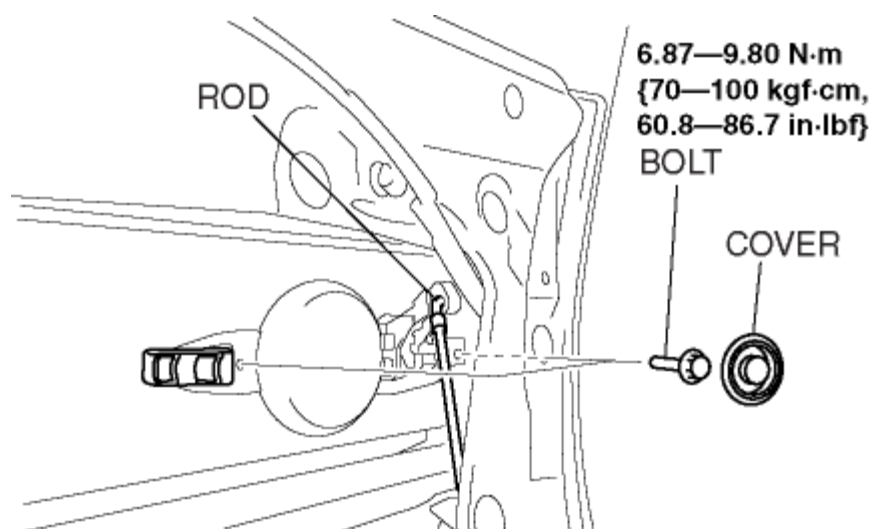


3. Install in the reverse order of removal.

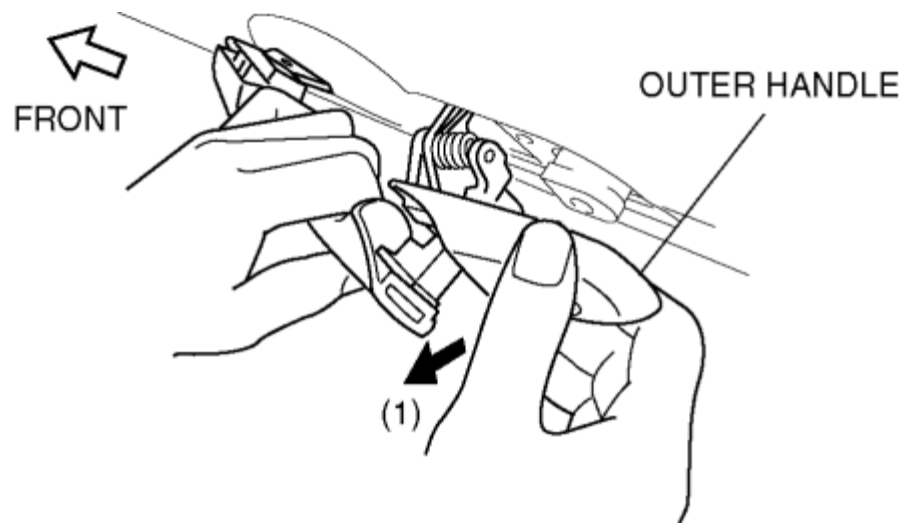
## 2008 - MX-5 - Body and Accessories

### OUTER HANDLE REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]

1. Remove the following parts:
  - a. Door trim (See [DOOR TRIM REMOVAL/INSTALLATION.](#))
  - b. Door glass (See [DOOR GLASS REMOVAL/INSTALLATION.](#))
  - c. Door speaker (See [DOOR SPEAKER REMOVAL/INSTALLATION.](#))
  - d. Door unit (See [DOOR UNIT REMOVAL/INSTALLATION.](#))
2. Detach the rod from the outer handle.



3. Remove the cover.
4. Remove the bolts.
5. Secure the rear part of the front outer handle and, with the front outer handle lever pulled outward (1), remove the rear part of the front outer handle from the front door.



6. Pull out the front part of the front outer handle from the front door.
7. Install in the reverse order of removal.

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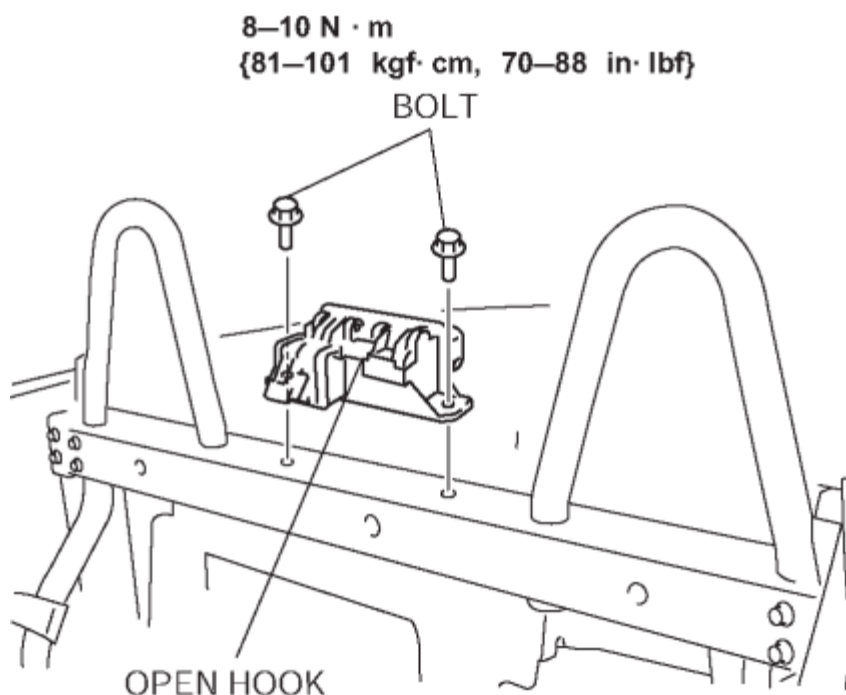
## 2008 - MX-5 - Body and Accessories

### OPEN HOOK REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]

1. Remove the following parts:

- a. Console (See [CONSOLE REMOVAL/INSTALLATION.](#))
- b. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION.](#))
- c. Scuff plate ([SCUFF PLATE REMOVAL/INSTALLATION.](#))
- d. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION.](#))
- e. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION.](#))
- f. Seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION.](#))
- g. Back trim (See [BACK TRIM REMOVAL/INSTALLATION.](#))
- h. Seat back bar lower garnish (See [SEAT BACK BAR LOWER GARNISH REMOVAL/INSTALLATION](#))

2. Remove the bolts.



3. Remove the open hook.

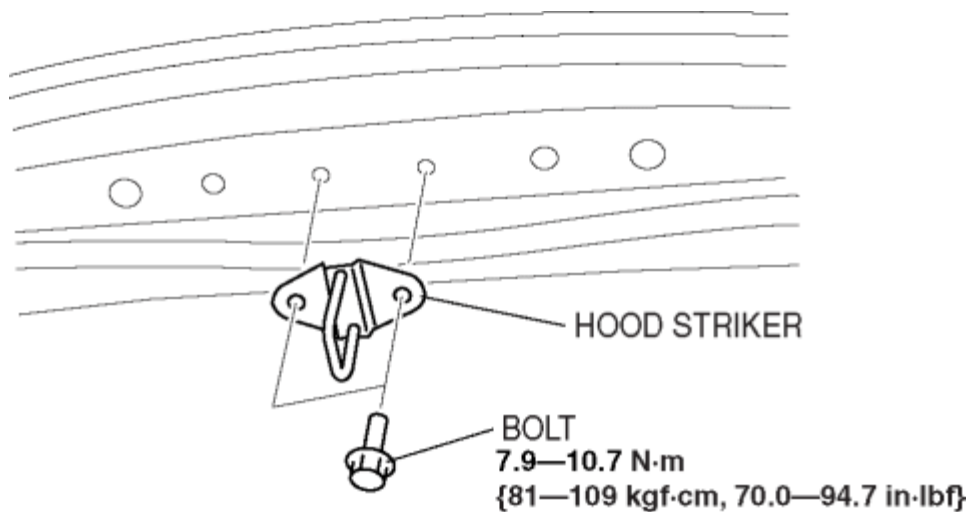
4. Install in the reverse order of removal.



## 2008 - MX-5 - Body and Accessories

### HOOD STRIKER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]

1. Remove the bolt, then remove the hood striker.

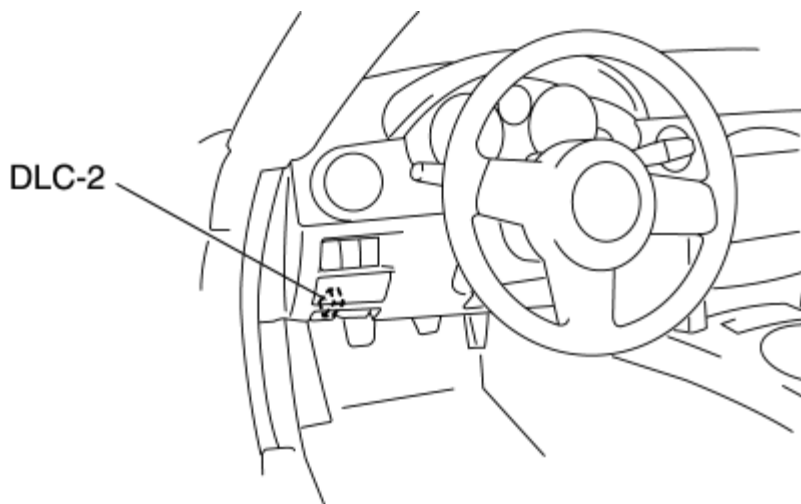


2. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### KEYLESS CONTROL MODULE CONFIGURATION [ADVANCED KEYLESS SYSTEM]

1. Connect the M-MDS to the DLC-2.

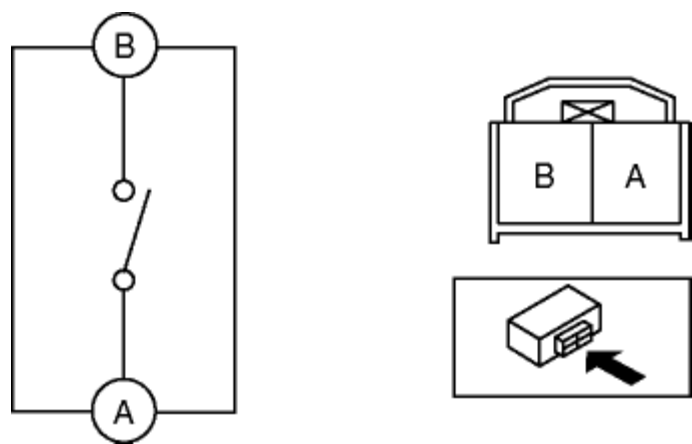


2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.
  - When using the IDS (laptop PC)
    - Select "Module Programming".
  - When using the PDS (Pocket PC)
    - Select "Programming".
    - Select "Module Programming".
3. Then, select the "Programmable Module Installation" and "RKE" from the screen menu.
4. Perform the configuration according to the directions on the screen.
5. Retrieve DTCs using the M-MDS, then verify if DTCs are present.
  - If a DTC is present, perform the applicable DTC inspection. (See [DTC TABLE \[ADVANCED KEYLESS SYSTEM\]](#).)

2008 - MX-5 - Body and Accessories

TOP LOCK SWITCH INSPECTION [ADVANCED KEYLESS SYSTEM]

- 1. Remove the front header trim. (See [FRONT HEADER TRIM REMOVAL/INSTALLATION](#).)
- 2. Disconnect the striker switch connector.
- 3. Verify that the continuity between the striker switch terminals is as indicated in the table.



- If not as indicated in the table, replace the striker.

○ — ○ : Continuity

Switch position	Terminal	
	A	B
Release		
Lock	○ — ○	

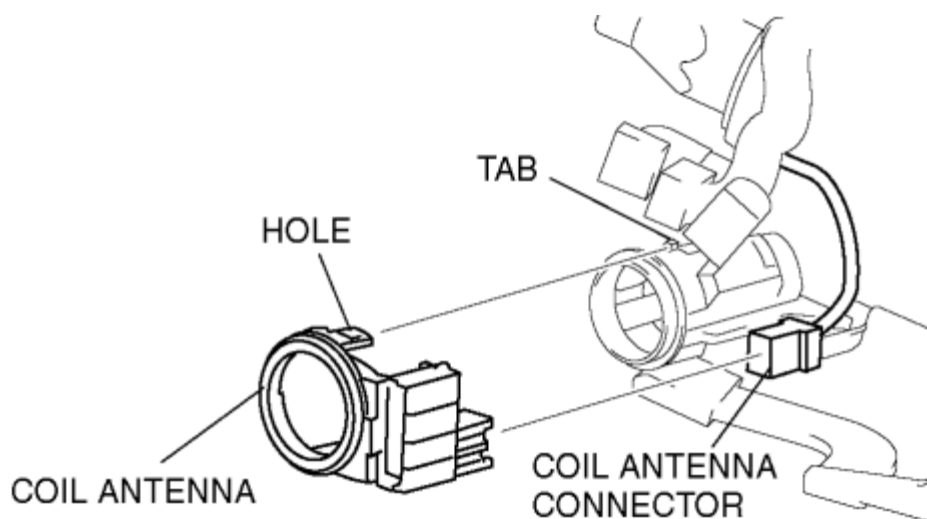


## 2008 - MX-5 - Body and Accessories

### COIL ANTENNA REMOVAL/INSTALLATION [KEYLESS ENTRY SYSTEM]

#### NOTE:

- Do not remove the coil antenna unless you are replacing it.
1. Disconnect the negative battery cable.
  2. Remove the following parts:
    - a. Hood release lever (See [HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION \[ADVANCED KEYLESS SYSTEM\]](#).)
    - b. Scuff plate (Driver's side) (See [SCUFF PLATE REMOVAL/INSTALLATION.](#))
    - c. Front side trim (Driver's side) (See [FRONT SIDE TRIM REMOVAL/INSTALLATION.](#))
    - d. Lower panel (See [LOWER PANEL REMOVAL/INSTALLATION.](#))
    - e. Column cover (See [COLUMN COVER REMOVAL/INSTALLATION.](#))
  3. Disconnect the coil antenna connector.



4. Detach the steering lock tabs from the holes on the coil antenna.
5. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]

#### Foreword

- When performing the following procedures, the immobilizer resetting procedure using the M-MDS must also always be performed: "instrument cluster replacement", "PCM replacement", "instrument cluster and PCM joint replacement", "Key ID number clearing". The engine will not start unless all work is performed using the M-MDS.
- There are two methods for registering an additional key: Using the M-MDS and using two keys that are able to start the engine.
- When replacing any of the immobilizer system component parts, adding/erasing keys or performing other functions, refer to the following table and perform the applicable procedure (No.1 to 7).

Reference number	Situation	Required items	Cautionary notes
1	Making a spare key when the customer has two or more keys that can start the engine. Or registering an additional key.	<ul style="list-style-type: none"><li>• Registration key</li></ul>	<ul style="list-style-type: none"><li>• If the additional key registration method has been changed to "Customer spare key programming disabled" (inhibiting the method that uses two keys that are able to start the engine), the M-MDS is required when registering the additional key. In that case, perform procedure No.2.</li></ul>
2	Making a spare key when the customer has one key that can start the engine or no keys. Or registering an additional key.	<ul style="list-style-type: none"><li>• Registration key</li><li>• M-MDS</li></ul>	-
	Clearing previously registered key ID numbers.	<ul style="list-style-type: none"><li>• Registration keys (two</li></ul>	<ul style="list-style-type: none"><li>• All the key ID numbers registered in the</li></ul>

3		<p>or more)</p> <ul style="list-style-type: none"> <li>• M-MDS</li> </ul>	<p>vehicle will be cleared.</p> <ul style="list-style-type: none"> <li>• Unless keys are re-registered after clearing the key ID numbers, the engine cannot be started. Before beginning the procedure, verify that the customer has turned in all of the keys for the vehicle.</li> <li>• Unless two or more keys are registered after replacement, the engine cannot be started.</li> <li>• The keys (two or more keys) readied before beginning the procedure do not have to be new keys. Any key that is capable of starting the engine before beginning the procedure can be used.</li> </ul>
3	Replace all the keys. (Key cylinder replacement)	<ul style="list-style-type: none"> <li>• Registration keys (two or more)</li> <li>• M-MDS</li> </ul>	<ul style="list-style-type: none"> <li>• When replacing the key cylinder, have two or more keys ready for registration before beginning the procedure, since the previous keys will be invalid.</li> </ul>
4	Changing the method for registering additional keys. (Method for registering other keys using two keys that can start the engine is disabled.)	<ul style="list-style-type: none"> <li>• M-MDS</li> </ul>	<ul style="list-style-type: none"> <li>• After performing this procedure it is not possible to register additional keys according to procedure No.1. The system can be returned to the original setting. The M-MDS must always be used to change the system setting.</li> </ul>
4	Changing the method for registering additional keys. (Method for registering other keys using two keys that can start the engine is enabled.)	<ul style="list-style-type: none"> <li>• M-MDS</li> </ul>	<ul style="list-style-type: none"> <li>• This is the default setting on new vehicles.</li> </ul>

5	Replacing the instrument cluster only.	<ul style="list-style-type: none"> <li>• New instrument cluster</li> <li>• Registration keys (two or more)</li> <li>• M-MDS</li> </ul>	<ul style="list-style-type: none"> <li>• Unless keys are registered after replacing the steering lock, the engine cannot be started. Before beginning the procedure, verify that the customer has turned in all of the keys for the vehicle.</li> <li>• Unless two or more keys are registered after replacement, the engine cannot be started.</li> <li>• The keys (two or more keys) readied before beginning the procedure do not have to be new keys. Any key that is capable of starting the engine before beginning the procedure can be used.</li> </ul>
6	Replacing the PCM only.	<ul style="list-style-type: none"> <li>• New PCM</li> <li>• M-MDS</li> </ul>	-
7	Replacing the PCM and instrument cluster at the same time.	<ul style="list-style-type: none"> <li>• New PCM</li> <li>• New instrument cluster</li> <li>• Registration keys (two or more)</li> <li>• M-MDS</li> </ul>	<ul style="list-style-type: none"> <li>• Unless keys are registered after replacing the steering lock, the engine cannot be started. Before beginning the procedure, verify that the customer has turned in all of the keys for the vehicle.</li> <li>• Unless two or more keys are registered after replacement, the engine cannot be started.</li> <li>• The keys (two or more keys) readied before beginning the procedure do not have to be new keys. Any key that is capable of starting the engine</li> </ul>

			before beginning the procedure can be used.
-	Replacing the coil antenna.	<ul style="list-style-type: none"> <li>• New coil antenna</li> </ul>	<ul style="list-style-type: none"> <li>• It is not necessary to reset the immobilizer system.</li> </ul>

### CAUTION:

- If any of the following items are touching or near the key head, signal communication between the key and vehicle is negatively affected, resulting in the engine not starting or the key registration failure. Do not perform the procedure if any of the following items are touching or near the key head.
  - Any metallic object
  - Spare keys or keys for other vehicles equipped with an immobilizer system
  - Any electronic device, or any credit or other cards with magnetic strips

### EXAMPLES:



METAL RING LYING ON KEY HEAD



METAL PART OF ANOTHER KEY TOUCHING KEY HEAD



KEY IS NEAR OR TOUCHING ANOTHER IMMOBILIZER SYSTEM KEY

### NOTE:

- Within the following procedures, the term a “valid key” means a “key that can start the engine”.
- After adding/registering keys, clearing ID numbers or replacing any component part of the immobilizer system, verify that all keys can start the engine **within 5 s**.
- When verifying that the keys can start the engine, wait at least **5 s or more** between inserting them.
- If the engine cannot be started using a registered key, repeat the procedure from the beginning.

- Do not start the engine until the key registration procedure for all the necessary keys is completed. If the engine is started during the registration procedure, registration is stopped at that point. Repeat the procedure starting from the beginning if the engine is started before completion.
- Two or more key ID numbers must be registered for the engine to start.
- A maximum of eight key ID numbers can be registered for one vehicle. The M-MDS can be used to verify the number of key ID numbers registered to a single vehicle.
- Do not select screen menus of the M-MDS that are not indicated within the procedures.

## No.1 Additional Key Registration Procedure (Using Two Valid Keys)

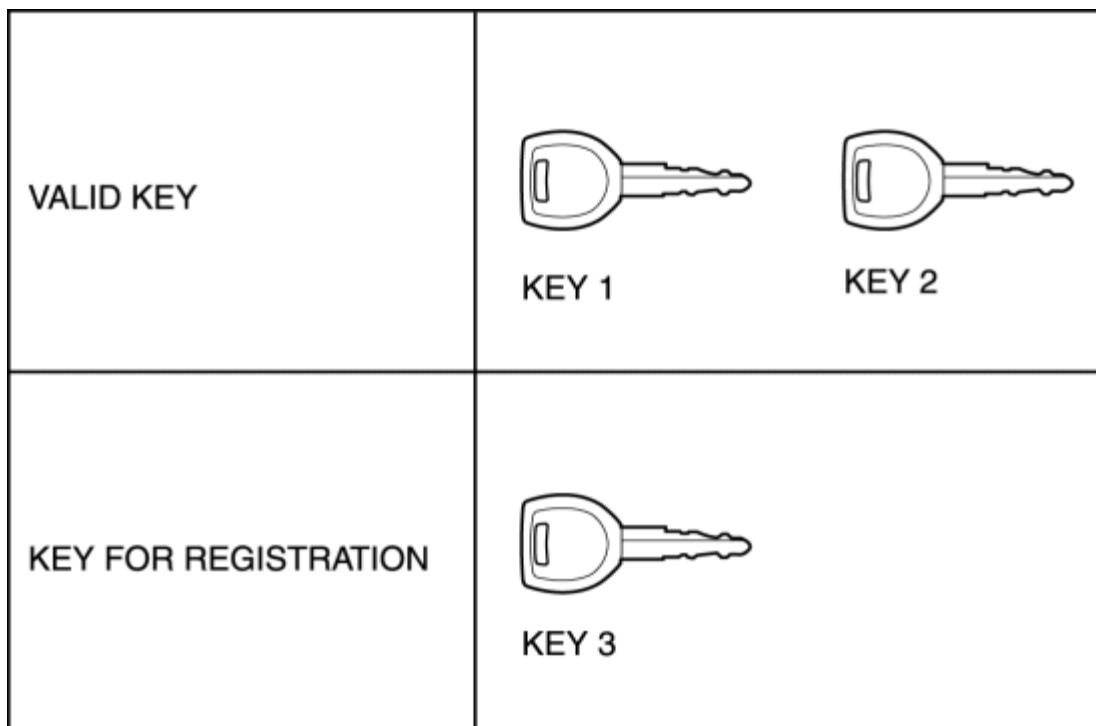
### Conditions

- Customer has two or more valid keys.

### NOTE:

- A maximum of eight keys can be registered for any one vehicle. If key registration is not successful and DTC 15 appears even though the procedure was performed properly, use the PID/data monitor function of the M-MDS and verify the number of keys that have been registered.
- If eight keys have already been registered, and it is necessary to register other keys, the previously registered key ID numbers must first be cleared. To clear the key ID numbers, refer to "[No.3 Key Replacement Procedure \(Clearing Previously Registered Key ID Numbers, Key Re-registration\)](#)".

### Procedure



1. Have one key (key 3) ready for registration.
2. Using key 1, turn the ignition switch to the ON position.
3. Verify that the security light illuminates for **approx. 3 s** and then goes out.
4. Using key 1, turn the ignition switch to the LOCK position **within approx. 4 s** after the security light goes out.
5. Remove key 1.
6. Repeat Steps 2—5 using key 2.
7. Repeat Steps 2—5 using key 3.
8. If additional keys need to be registered, repeat Steps 2—7 in the same manner as key 3.

## No.2 Additional Key Registration Procedure (Using the M-MDS)

### Conditions

- Customer has only one valid key. Or customer has no valid keys. (Can also be performed even if there are two or more valid keys)

### NOTE:

- A maximum of eight keys can be registered for any one vehicle. If key registration is not successful and DTC 15 appears even though the procedure was performed properly, use the PID/data monitor function of the M-MDS and verify the number of keys that have been registered.
- If eight keys have already been registered, and it is necessary to register other keys, the previously registered key ID numbers must first be cleared. To clear the key ID numbers, refer to "**No.3 Key Replacement Procedure (Clearing Previously Registered Key ID Numbers, Key Re-registration)**".

### Procedure

1. Have one key (key 1) ready for registration.
2. Connect the M-MDS to the DLC-2.
3. Using key 1, turn the ignition switch to the ON position.

### NOTE:

- Although the security light flashes and DTC 15 is displayed, this does not indicate an improper procedure. Continue to perform the procedure as indicated.
4. Select "Body/Security/PATS Function" from the M-MDS screen menu.
  5. Select "Program Additional Ignition Key" from the M-MDS screen menu.
  6. Perform security access as indicated on the M-MDS screen. (See **No.8 Security Access Procedure**.)

### NOTE:

- After selecting the above menu, "This operation has been successful" is displayed. At this point, the key that turned the ignition switch to the ON position is completely programmed.
- In this procedure, the necessary number of the keys are completely programmed. To finish the additional key programming, go to 10.
- If additional keys need to be programmed, go to the next step.

7. After verifying that the PATS function menu is displayed again on the M-MDS screen, turn the ignition switch to the LOCK position and remove key 1.

8. Using the additional key to be programmed, turn the ignition switch to the ON position.

9. Return to the Step 5.

10. After verifying that the PATS function menu is displayed again on the M-MDS screen, select the "Exit (From This Menu)" to finish the M-MDS procedure.

11. After Step 10, wait **5 s or more** and then turn the ignition switch to the LOCK position.

12. Disconnect the M-MDS from the DLC-2.

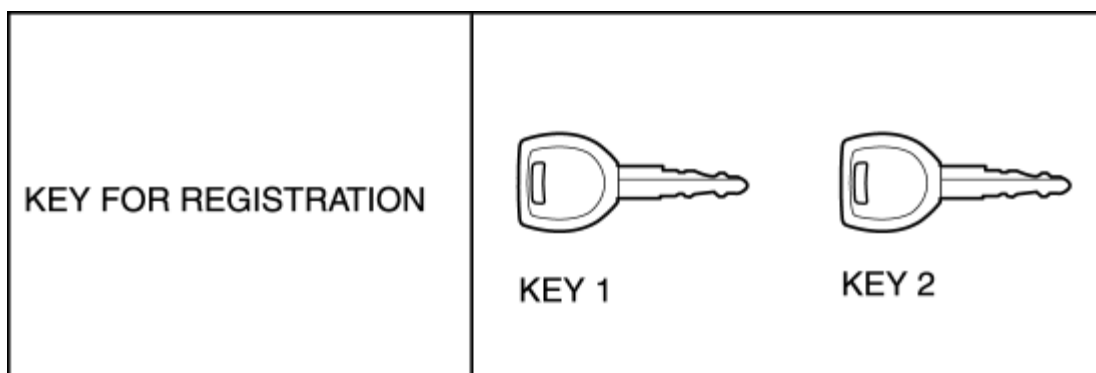
13. Verify that the all keys can start the engine for **5 s or more after** the procedure.

### No.3 Key Replacement Procedure (Clearing Previously Registered Key ID Numbers, Key Re-registration)

#### Conditions

- Have two or more keys to be programmed after the key ID number clearing.

#### Procedure



1. Have two or more keys (key 1, key 2) ready for registration after the clearing the key ID numbers.

2. Connect the M-MDS to the DLC-2.

3. Using key 1, turn the ignition switch to the ON position.

#### NOTE:

- Although the security light flashes and DTC 15 is displayed, this does not



indicate an improper procedure. Continue to perform the procedure as indicated.

4. Select "Body/Security/PATS Function" from the M-MDS screen menu.
5. Select "Ignition key Code Erase" from the M-MDS screen menu and perform the tasks according to the M-MDS screen.
6. Perform security access as indicated on the M-MDS screen. (See [No.8 Security Access Procedure](#).)
7. After verifying that the PATS function menu is displayed again on the M-MDS screen, select "Exit (From This Menu)" to finish the M-MDS procedure.
8. After Step 7, wait **5 s or more** and then turn the ignition switch to the LOCK position using key 1.
9. Using key 1, turn the ignition switch to the ON position.

**NOTE:**

- Although the security light remains illuminated and DTC 21 is displayed after **approx. 1 min**, this does not indicate an improper procedure. Continue to perform the procedure as indicated.
10. After Step 9, wait **3 s or more** and turn the ignition switch to the LOCK position, remove key 1.
  11. Using key 2, turn the ignition switch to the ON position.
  12. Verify that the security light illuminates for **approx. 3 s** and then turns off.
  13. After verifying that the security light turns off, turn the ignition switch to the LOCK position and remove key 2.
  14. If programming one more keys, repeat Steps 11 to 13 with a key to be programmed as key 3. Steps 11 to 13 must be performed **within 1 min** for each key. If the vehicle is left with the ignition switch in the ON position for 1 min or more, additional key programming according to Steps 11 to 13 is disabled. If this occurs, refer to "No.1 Additional Key Registration Procedure (Using Two Valid Keys)" to register any additional keys.
  15. Verify that the all keys can start the engine for **5 s or more after** the procedure.

#### **No.4 Changing the Method for Registering Additional Keys**

**NOTE:**

- This procedure is for changing the enable/disable setting of the "No.1 Additional Key Registration Procedure (Using Two Valid Keys)".
- The default setting for new vehicles and new instrument cluster replacement is "Enabled".
- By disabling the "No.1 Additional Key Registration Procedure (Using Two Valid Keys)", only the M-MDS can be used to register additional keys, thereby preventing two valid keys from being used to create an unauthorized spare key. This function is for use by rental car or other companies with vehicle fleets.

Procedure

- 1. Connect the M-MDS to the DLC-2.
- 2. Using any key, turn the ignition switch to the ON position. (Either a valid or an unregistered key can be used.)

NOTE:

- When using an unregistered key, although the security light flashes and DTC 15 is displayed, this does not indicate an improper procedure. Continue to perform the procedure as indicated.

- 3. Select “Body/Security/PATS Function” from the M-MDS screen menu.
- 4. Select either “Customer Spare Key Programming Enable” or “Customer Spare Key Programming Disable” from the M-MDS screen menu. Depending on the selected menu, the additional key registration method is as shown below:

Setting	Additional key registration method	
	Procedure using two valid keys	Procedure using the M-MDS
Customer Spare Key Programming Enable	x	x
Customer Spare Key Programming Disable	-	x

- x  
Procedure is possible
- Procedure is not possible

- 5. Perform security access as indicated on the M-MDS screen. (See [No.8 Security Access Procedure](#).)
- 6. After verifying that the PATS function menu is displayed again on the M-MDS screen, select “Exit” to complete the M-MDS function.
- 7. After Step 6, wait **10 s or more** and then turn the ignition switch to the LOCK position.

No.5 Resetting Procedure for the Immobilizer System when Replacing the Instrument Cluster Replacement

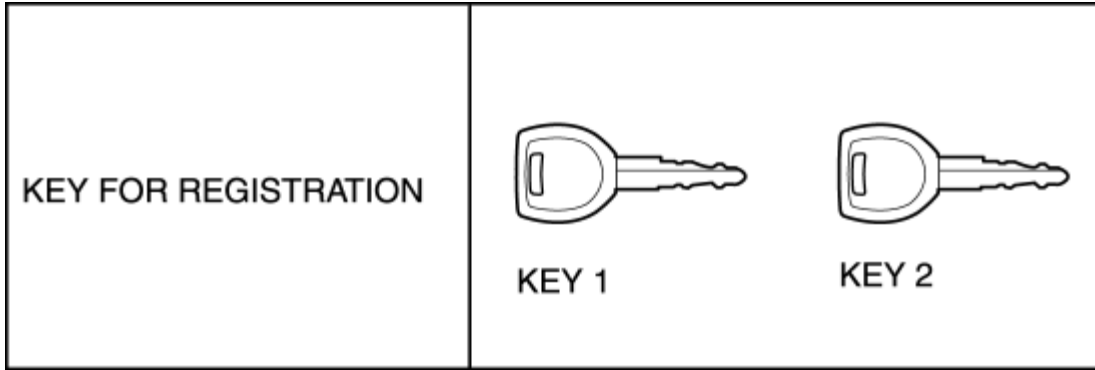
Conditions

- Have two or more keys to be programmed after the key ID number clearing.

CAUTION:

- Before starting Step 1, complete the procedure for the instrument cluster replacement.

## Procedure



1. Have two or more keys (key 1, key 2) ready for registration.
2. Connect the M-MDS to the DLC-2.
3. Using key 1, turn the ignition switch to the ON position.

### NOTE:

- Although the security light flashes and DTC 15 is displayed, this does not indicate an improper procedure. Continue to perform the procedure as indicated.

4. Select "Body/Security/PATS Function" from the M-MDS screen menu.
5. Select "Parameter Reset" from the M-MDS screen menu.
6. Perform security access as indicated on the M-MDS screen. (See [No.8 Security Access Procedure](#).)
7. Select the replaced part as indicated on the M-MDS screen.
  - If the instrument cluster is replaced: Select "HEC".

### NOTE:

- At this time, do not select any other parts from the M-MDS screen menu.

8. Select "Ignition Key Code Erase and Program" from the M-MDS screen menu and perform the procedure according to the M-MDS screen.
9. Perform security access as indicated on the M-MDS screen. (See [No.8 Security Access Procedure](#).)
10. After verifying that the PATS function menu is displayed again on the M-MDS screen, select "Exit (From This Menu)" to finish the M-MDS procedure.
11. After Step 10, wait **5 s or more** and then turn the ignition switch to the LOCK position.
12. Disconnect the M-MDS from the DLC-2.
13. Using key 1, turn the ignition switch to the ON position.

### NOTE:

- Although the security light remains illuminated and DTC 21 is displayed after **approx. 1 min**, this does not indicate an improper procedure. Continue to

perform the procedure as indicated.

14. After Step 13, wait **3 s or more** and turn the ignition switch to the LOCK position, remove key 1.
15. Using key 2, turn the ignition switch to the ON position.
16. Verify that the security light illuminates for **approx. 3 s** and then turns off.
17. After verifying that the security light turns off, turn the ignition switch to the LOCK position and remove key 2.
18. If programming one more keys, repeat Steps 15 to 17 with a key to be programmed as key 3. Steps 15 to 17 must be performed **within 1 min** for each key. If the vehicle is left with the ignition switch in the ON position for 1 min or more, additional key programming according to Steps 15 to 17 is disabled. If this occurs, refer to "No.1 Additional Key Registration Procedure (Using Two Valid Keys)" to register any additional keys.
19. Verify that the all keys can start the engine for **5 s or more after** the procedure.

## No.6 Resetting Procedure for the Immobilizer System when Replacing the PCM Replacement

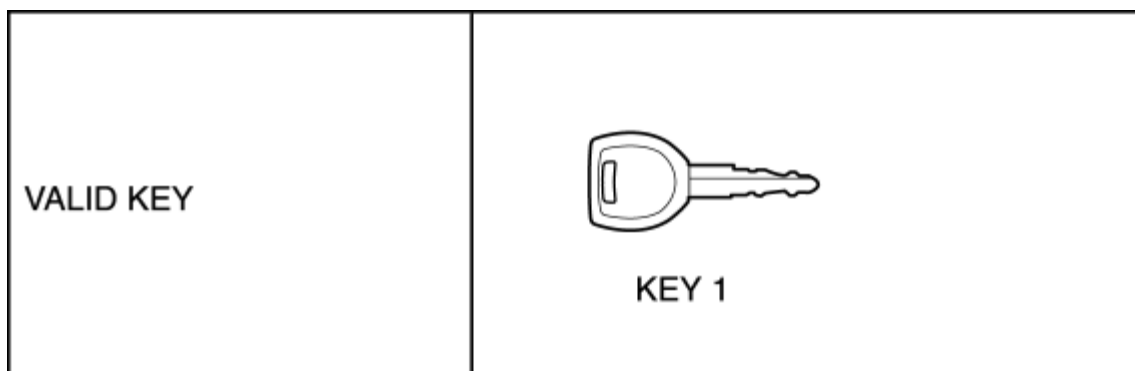
### Conditions

- There is only one valid key.

### CAUTION:

- Before starting Step 1, complete the procedure for the PCM replacement.

### Procedure



1. Have two or more keys (key 1, key 2) ready for registration.
2. Connect the M-MDS to the DLC-2.
3. Using key 1, turn the ignition switch to the ON position.

### NOTE:

- Although the security light remains illuminated and DTC 23 is displayed after approx. 1 min, this does not indicate an improper procedure. Continue to perform the procedure as indicated.
4. Select "Body/Security/PATS Function" from the M-MDS screen menu.

5. Select "Parameter Reset" from the M-MDS screen menu.
6. Perform security access as indicated on the M-MDS screen. (See [No.8 Security Access Procedure](#).)
7. Select the replaced part as indicated on the M-MDS screen.
  - If the instrument cluster is replaced: Select "PCM".

**NOTE:**

- At this time, do not select any other parts from the M-MDS screen menu.
8. After verifying that the PATS function menu is displayed again on the M-MDS screen, select "Exit (From This Menu)" to finish the M-MDS procedure.
  9. After Step 8, wait **5 s or more** and then turn the ignition switch to the LOCK position.
  10. Disconnect the M-MDS from the DLC-2.
  11. Using key 1, turn the ignition switch to the ON position.
  12. After verifying that the security light illuminates for **3 s or more**, turn the ignition switch to the LOCK position, remove key 1.

## **No.7 Resetting Procedure for the Immobilizer System when Replacing the PCM and Instrument Cluster at the Same Time**

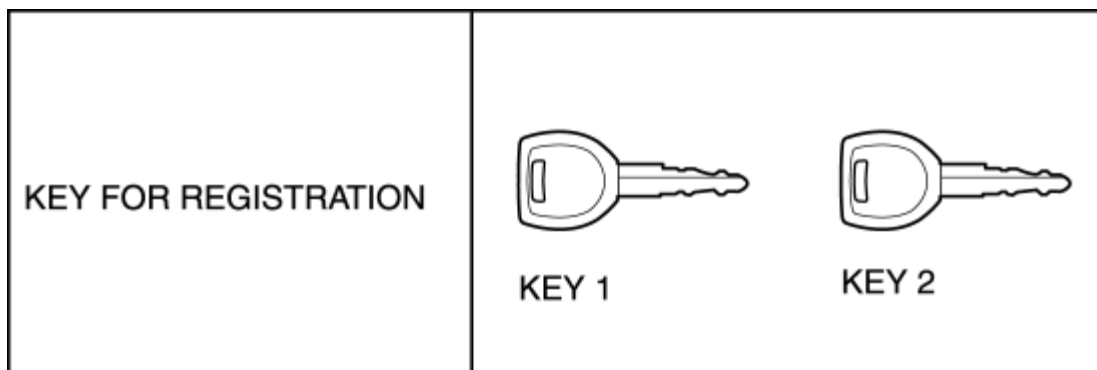
### **Conditions**

- Have two or more keys to be programmed after the key ID number clearing.

### **CAUTION:**

- Before starting Step 1, complete the procedure for the PCM and instrument cluster replacement.

### **Procedure**



1. Have two or more keys (key 1, key 2) ready for registration.
2. Connect the M-MDS to the DLC-2.
3. Using key 1, turn the ignition switch to the ON position.

#### NOTE:

- Although the security light flashes and DTC 15 is displayed, this does not indicate an improper procedure. Continue to perform the procedure as indicated.

4. Select "Body/Security/PATS Function" from the M-MDS screen menu.
5. Select "Parameter Reset" from the M-MDS screen menu.
6. Perform security access as indicated on the M-MDS screen. (See [No.8 Security Access Procedure](#).)
7. Select the replaced part as indicated on the M-MDS screen.
  - If the PCM is replaced: Select "PCM".
  - If the instrument cluster is replaced: Select "HEC".

#### NOTE:

- At this time, do not select any other parts from the M-MDS screen menu.
8. Select "Ignition Key Code Erase and Program" from the M-MDS screen menu and perform the procedure according to the M-MDS screen.
  9. Perform security access as indicated on the M-MDS screen. (See [No.8 Security Access Procedure](#).)
  10. After verifying that the PATS function menu is displayed again on the M-MDS screen, select "Exit (From This Menu)" to finish the M-MDS procedure.
  11. After Step 10, wait **5 s or more** and then turn the ignition switch to the LOCK position.
  12. Disconnect the M-MDS from the DLC-2.
  13. Using key 1, turn the ignition switch to the ON position.

#### NOTE:

- Although the security light remains illuminated and DTC 21 is displayed after **approx. 1 min**, this does not indicate an improper procedure. Continue to perform the procedure as indicated.
14. After Step 13, wait **3 s or more** and turn the ignition switch to the LOCK position, remove key 1.
  15. Using key 2, turn the ignition switch to the ON position.
  16. Verify that the security light illuminates for **approx. 3 s** and then turns off.
  17. After verifying that the security light turns off, turn the ignition switch to the LOCK position and remove key 2.
  18. If programming one more keys, repeat Steps 15 to 17 with a key to be programmed as key 3. Steps 15 to 17 must be performed **within 1 min** for each key. If the vehicle is left with the ignition switch in the ON position for 1 min or more, additional key programming according to Steps 15 to 17 is disabled. If this occurs, refer to "No.1 Additional Key Registration Procedure (Using Two Valid Keys)" to register any additional keys.
  19. Verify that the all keys can start the engine for **5 s or more after** the procedure.

## No.8 Security Access Procedure

### NOTE:

- Security access must be performed when performing the following functions: "Program Additional Ignition Key", "Ignition Key ID Number Erase", "Customer Spare Key Programming Enable/Disable" and "Parameter Reset".

### Procedure

1. Connect the M-MDS to the DLC-2.
2. Select "Body/Security/PATS Function" from the M-MDS screen menu.
3. Security access is started and the M-MDS displays "Outcode".

### CAUTION:

- After reading out the outcode, do not turn ignition switch from LOCK to ON position 5 times, otherwise the outcode value will be changed.
4. Input the corresponding "Incode" for the "Outcode" displayed on the M-MDS screen.
  5. After successfully performing security access, "Program Additional Ignition Key", "Ignition key Code Erase", "Customer Spare Key Programming Enable/Disable" or "Parameter Reset" is displayed on the M-MDS screen.

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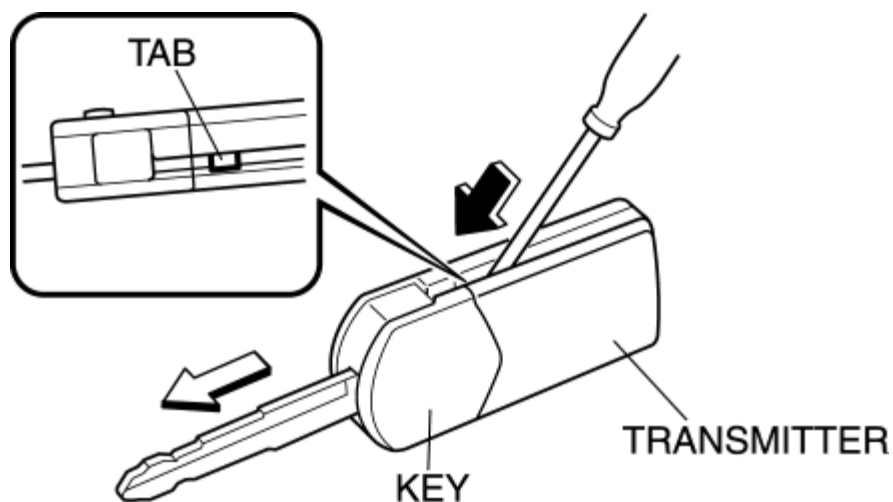
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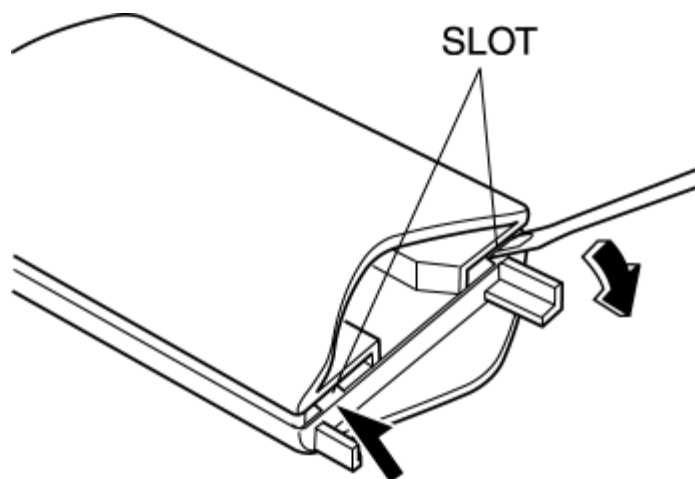
### TRANSMITTER BATTERY REPLACEMENT [KEYLESS ENTRY SYSTEM]

#### Retractable Key Type

1. Insert a small screwdriver into the slot and push the tab to remove the key from the transmitter.

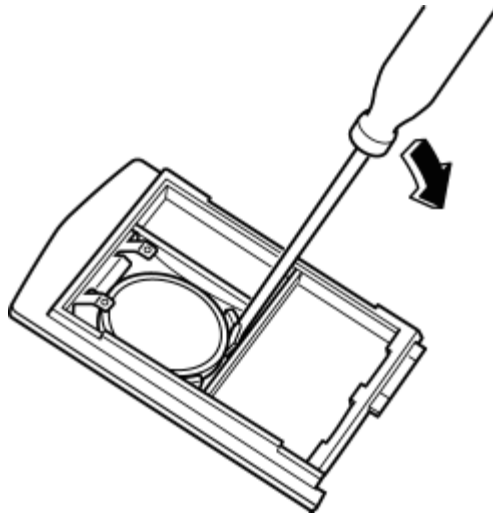


2. Insert a small screwdriver into the slot and gently pry open the transmitter.

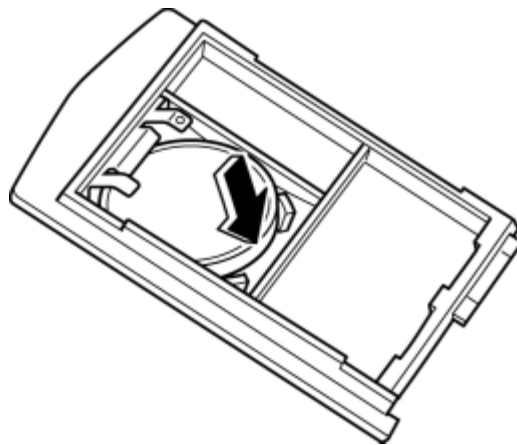


3. Remove the battery.





4. Put in the new battery (CR1620) with the positive pole (+) facing down.



5. Align the front and back covers and snap the transmitter shut.

#### **Battery specification**

- Lithium CR1620 × 1

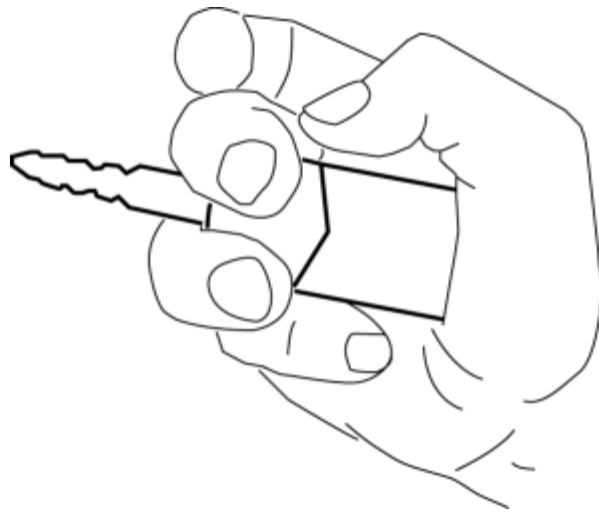
#### **NOTE:**

- The batteries will last about **2 years** when used **10 times** a day.

6. Install the key to the transmitter.

#### **NOTE:**

- When attaching the key to the transmitter, squeeze them together until a click sound is heard.
- If the key is not securely attached it will separate from the transmitter.



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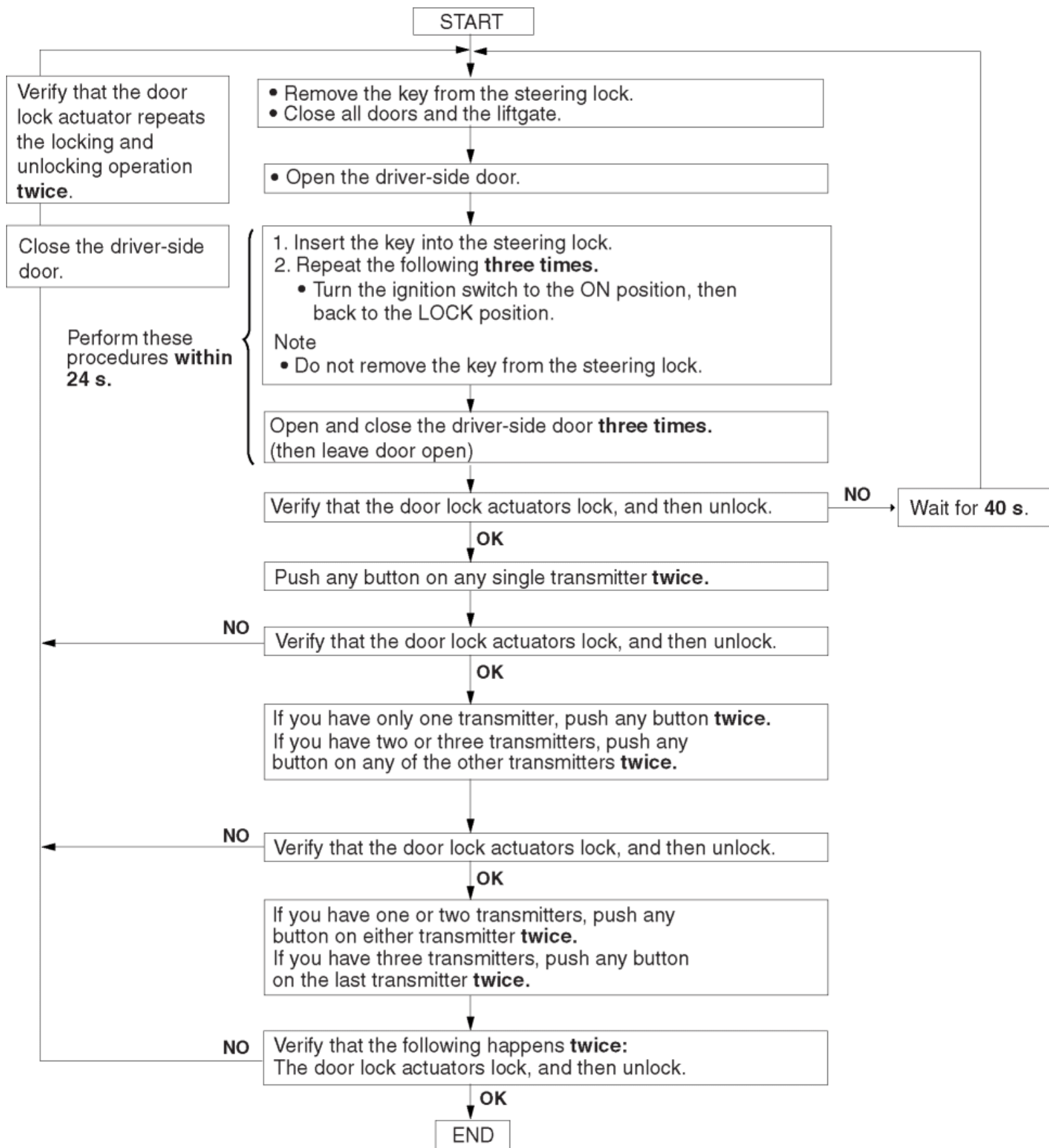
### TRANSMITTER ID CODE REGISTRATION [KEYLESS ENTRY SYSTEM]

#### CAUTION:

- Always program three ID codes because the programming mode terminates if three ID codes are programmed. At this time, the same transmitter (programmed transmitter) can be programmed two or three times.

#### NOTE:

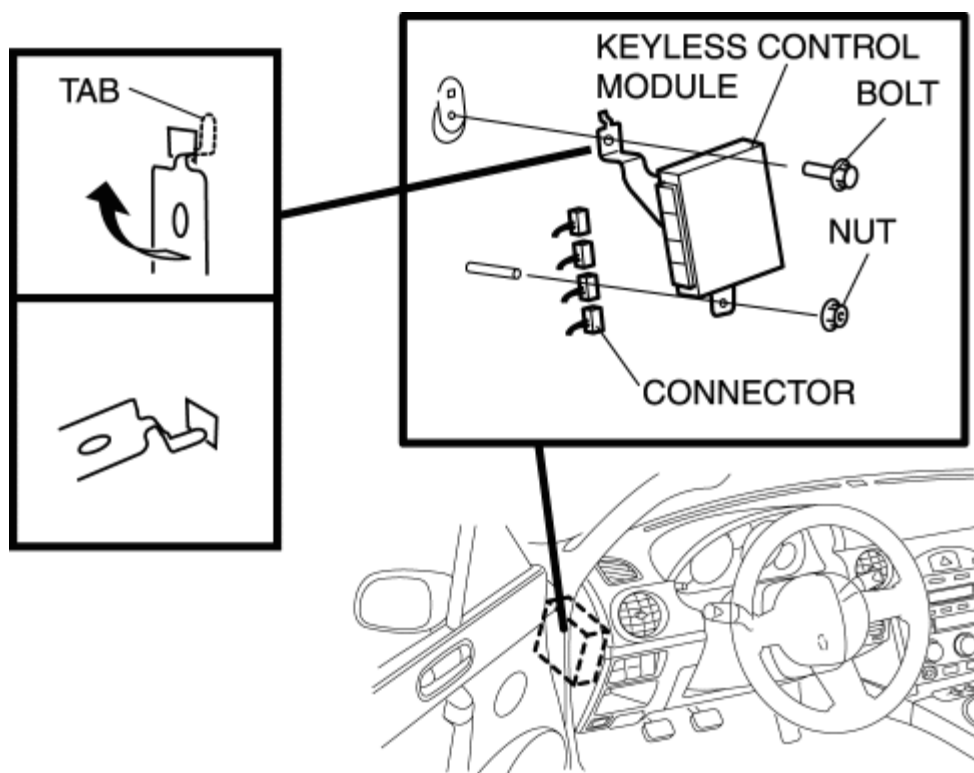
- Always program three ID codes because all the ID codes programmed prior to activation are cleared when the programming mode is activated.
- A maximum of three ID codes can be programmed.
- When programming the ID code into a keyless control module, verify that other transmitters are not being operated in the vicinity.
- After ID code programming, remove the key from the steering lock and verify that all doors lock/unlock normally using the transmitter.



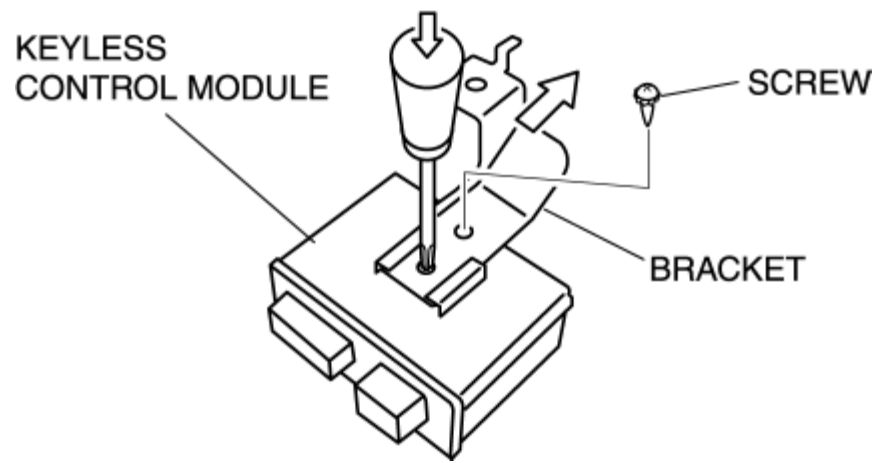
## 2008 - MX-5 - Body and Accessories

### KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [KEYLESS ENTRY SYSTEM]

1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
2. Remove the side panel. (See [SIDE PANEL REMOVAL/INSTALLATION](#).)
3. Remove the bolt and nut.



4. While inclining the keyless control module along the body panel in the direction indicated by the arrow, disengage the bracket tab from the hole in the body panel.
5. Disconnect the keyless control module connector.
6. Remove the keyless control module.
7. Remove the screw, then remove the bracket.



**NOTE:**

- The screw which fixes the keyless control module and bracket is for a body ground connection. Be sure to secure the screw when installing.

8. Install in the reverse order of removal.

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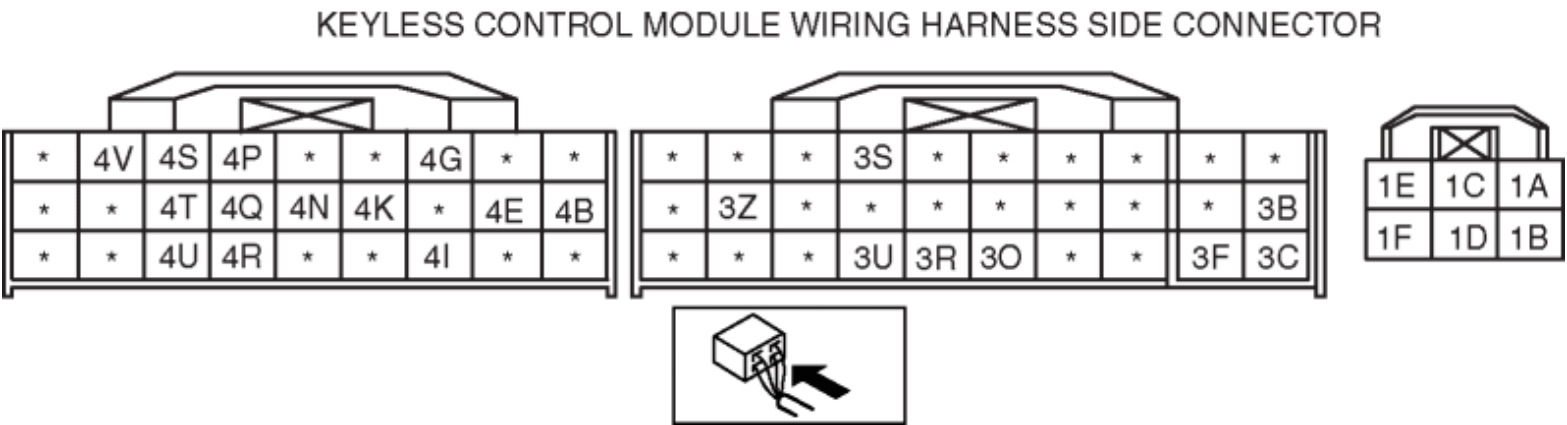
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KEYLESS CONTROL MODULE INSPECTION [KEYLESS ENTRY SYSTEM]

1. Measure the voltage or inspect for continuity according to the Terminal Voltage Table (Reference).
- If the voltage is not as specified in the Terminal Voltage Table (Reference), inspect the parts under "Inspection item(s)" and related wiring harnesses.

Terminal Voltage Table (Reference)



Terminal	Signal name	Connected to	Measured condition	Voltage (V)/Continuity	Inspection item(s)
1A	Door unlock control	Door lock actuator (driver's side)	Door lock actuator unlocking	1.0 or less → B+ → 1.0 or less	<div><div></div><div>• Door lock actuator (driver's side)</div><div>• Related wiring harnesses</div></div>
			Other	1.0 or less	
1B	GND	GND	Under any condition: Inspect for continuity to GND.	Continuity detected	<div><div></div><div>• Related wiring harnesses</div></div>
1C	Door lock control	Door lock actuator	Door lock actuator locking	1.0 or less → B+ → 1.0 or less	<div><div></div><div>• Door lock actuator</div><div>• Related wiring</div></div>

			Other	1.0 or less	harnesses
1D	Door unlock control	Door lock actuator (except driver's side)	Door lock actuator unlocking	1.0 or less → B+ → 1.0 or less	<ul style="list-style-type: none"> <li>Door lock actuator (except driver's side)</li> <li>Related wiring harnesses</li> </ul>
			Other	1.0 or less	
1E	Power supply	D.LOCK 20 A fuse	Under any condition	B+	<ul style="list-style-type: none"> <li>D.LOCK 20 A fuse</li> <li>Battery</li> </ul>
1F	Power supply	ROOM 15 A fuse	Under any condition	B+	<ul style="list-style-type: none"> <li>ROOM 15 A fuse</li> <li>Battery</li> </ul>
3B	IG1	METER 15 A fuse	Ignition switch is at ON position	B+	METER 15 A fuse
			Ignition switch is at LOCK or ACC position	1.0 or less	
3C	GND	body ground	Under any condition: Inspect for continuity to ground.	Continuity detected	GND
3F	Security light	Instrument cluster	Under any condition: Inspect for continuity to instrument cluster.	Continuity detected	Instrument cluster
3O	Key reminder switch	Steering lock unit	Key reminder switch is ON	B+	Steering lock unit
			Other	1.0 or less	
3R	TPMS signal	Instrument cluster	Under any condition: Inspect for continuity to instrument cluster.	Continuity detected	Instrument cluster
3S	Power supply (keyless receiver)	Keyless receiver	Under any condition	B+	Keyless receiver
3U	Communication (keyless receiver)	Keyless receiver	Under any condition: Inspect for continuity to keyless receiver.	Continuity detected	Keyless receiver



3Z	Trunk open signal	Trunk compartment light switch	Trunk lid open (trunk compartment light switch on)	1.0 or less	<ul style="list-style-type: none"> <li>Trunk compartment light switch</li> <li>Related wiring harnesses</li> </ul>
			Trunk lid closed (trunk compartment light switch off)	B+	
4B	Lock/unlock input	Door lock switch	Door lock switch is locked	2.5	<ul style="list-style-type: none"> <li>Door lock switch (driver-side)</li> <li>Door lock switch (passenger-side)</li> <li>Related wiring harnesses</li> </ul>
			Door lock switch is unlocked	1.0 or less	
			Other	5	
4E	Lock signal input	Door lock-link switch (driver-side)	Driver-side door is locked: Inspect for continuity to ground.	Continuity detected	Door lock-link switch (driver-side)
			Driver-side door is unlocked: Inspect for continuity to ground.	No continuity	
4G	Lock/unlock input	Driver-side door key cylinder switch	At the moment key cylinder is locked	2.5	<ul style="list-style-type: none"> <li>Driver-side door key cylinder switch</li> <li>Related wiring harnesses</li> </ul>
			At the moment key cylinder is unlocked	1.0 or less	
			At the moment key cylinder is neutral position	5	
4I	Unlock signal input	Door lock-link switch (driver-side)	Driver-side door is unlocked: Inspect for continuity to ground.	Continuity detected	Door lock-link switch (driver-side)
			Driver-side door is locked: Inspect for continuity to ground.	No continuity	
4K	Unlock input (trunk lid)	Trunk key cylinder switch	At the moment key cylinder is unlocked	1.0 or less	<ul style="list-style-type: none"> <li>Trunk key cylinder switch</li> <li>Related</li> </ul>
			At the moment key		

			cylinder is neutral position	5	wiring harnesses
4N	Hazard output	Hazard warning light	Press the LOCK button (transmitter)	B+ → 1.0 or less → B+	<ul style="list-style-type: none"> <li>Hazard warning light</li> <li>Related wiring harnesses</li> </ul>
			Press the UNLOCK button (transmitter)	B+ → 1.0 or less → B+ → 1.0 or less → B+	
			Other	B+	
4P	Trunk open output	Trunk opener relay	Press the trunk open switch	1.0 or less	<ul style="list-style-type: none"> <li>Trunk opener relay</li> <li>Related wiring harnesses</li> </ul>
			Other	B+	
4Q	Door switch signal (RH) output	Door switch	Door open (RH) (Door switch on)	1.0 or less	<ul style="list-style-type: none"> <li>Door switch (RH)</li> <li>Related wiring harnesses</li> </ul>
			Door closed (RH) (Door switch off)	B+	
4R	Unlock signal input	Door lock-link switch (passenger-side)	Passenger-side door is unlocked: Inspect for continuity to ground.	Continuity detected	Door lock-link switch (passenger-side)
			Passenger-side door is locked: Inspect for continuity to ground.	No continuity	
4S*1	Serial communication	Power window main switch	Because this terminal is for communication, good/no good judgment by terminal voltage is not possible.	-	<ul style="list-style-type: none"> <li>Power window main switch</li> <li>Related wiring harnesses</li> </ul>
4T	Door switch signal (LH) output	Door switch	Door open (LH) (Door switch on)	1.0 or less	<ul style="list-style-type: none"> <li>Door switch (LH)</li> <li>Related wiring harnesses</li> </ul>
			Door closed (LH) (Door switch off)	B+	
			Transmitter LOCK button is	B+ → 1.0 or	<ul style="list-style-type: none"> <li>Horn relay</li> </ul>

4U	Horn on/off	Horn relay	pressed twice within 5 s.	less→B+	<ul style="list-style-type: none"><li>• Related wiring harnesses</li></ul>
			Other	B+	
4V	Hood switch signal	Hood switch	Hood open (Hood latch switch off)	B+	<ul style="list-style-type: none"><li>• Hood latch switch</li><li>• Related wiring harnesses</li></ul>
			Hood closed (Hood latch switch on)	1.0 or less	

\*1  
**With exterior open function (Power window system)**

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KEYLESS RECEIVER INSPECTION [KEYLESS ENTRY SYSTEM]

1. Measure the voltage or inspect for continuity according to the Terminal Voltage Table (Reference).
- If the voltage is not as specified in the Terminal Voltage Table (Reference), inspect the parts under "Inspection item(s)" and related wiring harnesses.

Terminal Voltage Table (Reference)



Terminal	Signal name	Connected to	Measured condition	Voltage (V)/Continuity	Inspection item(s)
A	Power supply	Keyless control module	Under any condition	B+	<div><div></div><div>• Keyless control module</div><div>• Related wiring harnesses</div></div>
C	Data	Keyless control module	Under any condition: Inspect the wiring harness between the keyless receiver and keyless control module terminal 3U for continuity.	Continuity detected	<div><div></div><div>• Keyless control module</div><div>• Related wiring harnesses</div></div>
E	GND	Body ground	Under any condition: Inspect for continuity to ground.	Continuity detected	GND

--	--	--	--	--	--	--

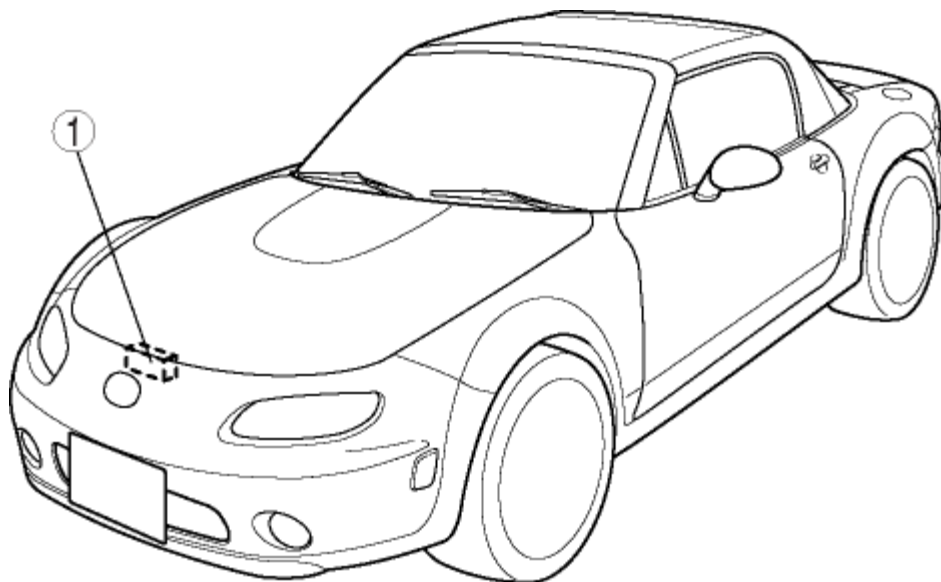
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### THEFT-DETERRENT SYSTEM LOCATION INDEX [KEYLESS ENTRY SYSTEM]



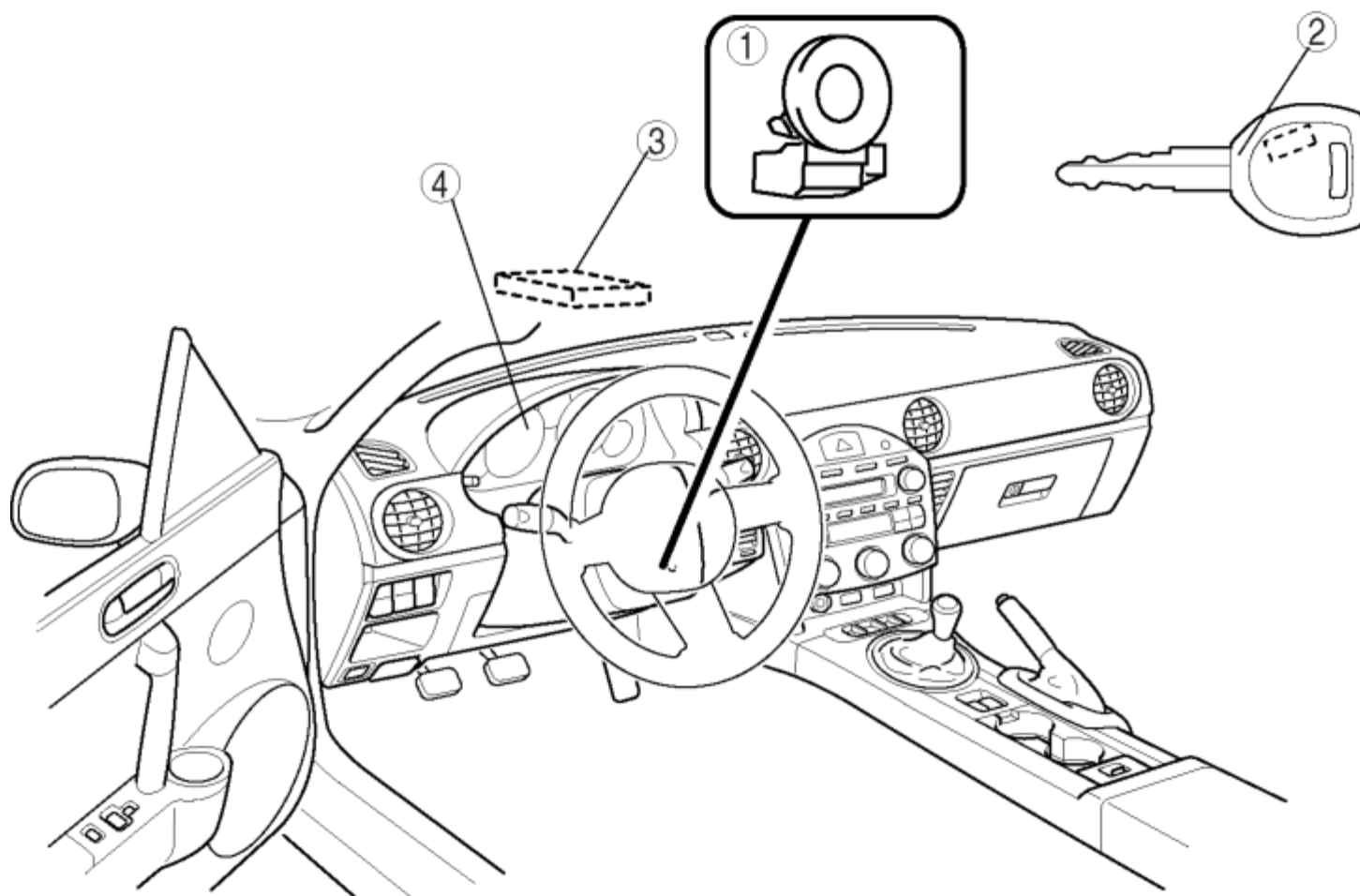
1 Hood latch

(See [HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION \[ADVANCED KEYLESS SYSTEM\]](#))

(See [HOOD LATCH SWITCH INSPECTION \[ADVANCED KEYLESS SYSTEM\]](#))

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### IMMOBILIZER SYSTEM LOCATION INDEX [KEYLESS ENTRY SYSTEM]



1 Coil antenna

(See [COIL ANTENNA REMOVAL/INSTALLATION \[KEYLESS ENTRY SYSTEM\]](#))

2 Key (transponder)

(See [IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING \[KEYLESS ENTRY SYSTEM\]](#))

3 PCM

(See [IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING \[KEYLESS ENTRY SYSTEM\]](#))

#### 4 Instrument cluster

(See **IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]**)

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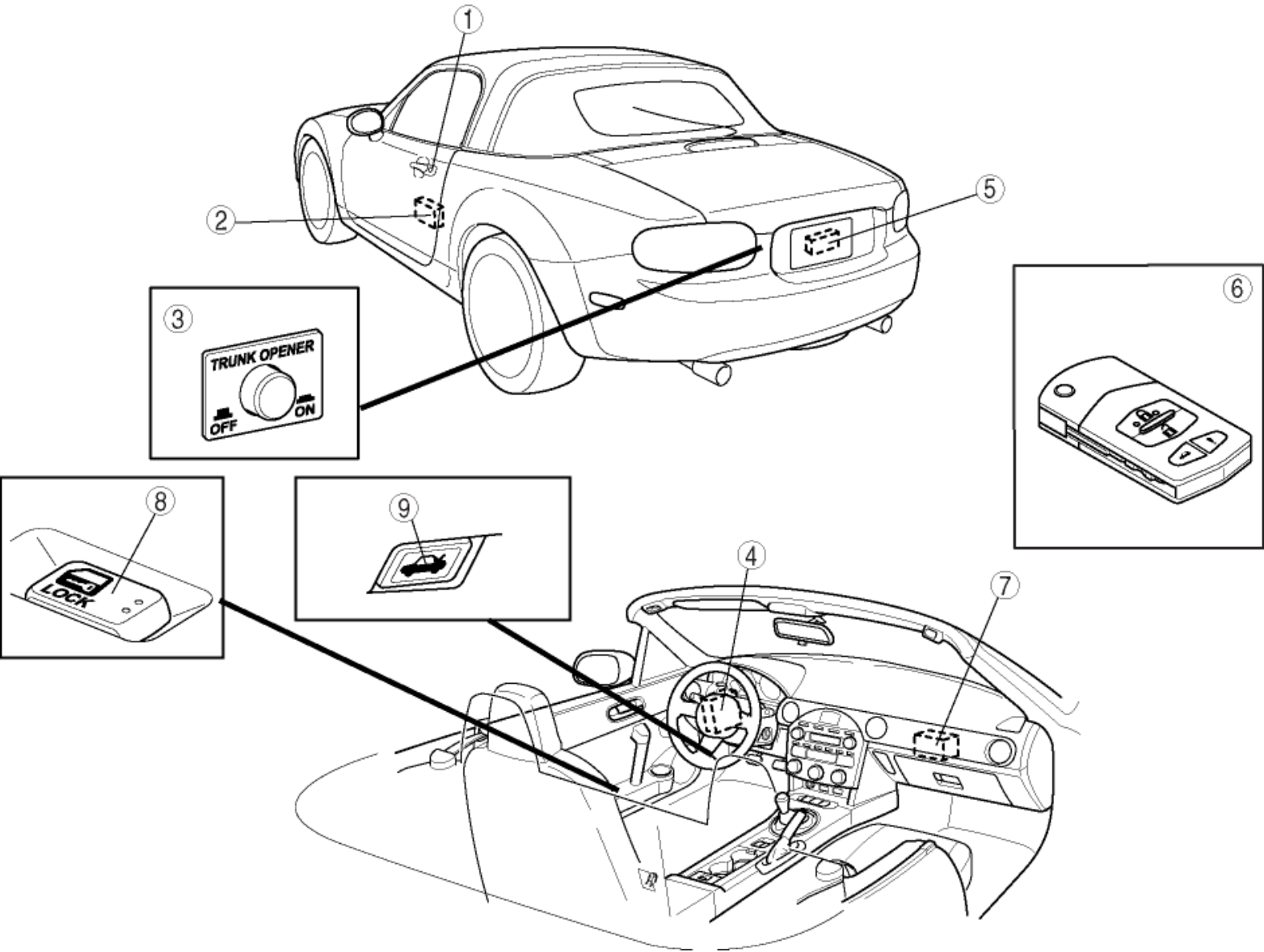
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POWER DOOR LOCK SYSTEM AND KEYLESS ENTRY SYSTEM LOCATION INDEX [KEYLESS ENTRY SYSTEM]



1	Door key cylinder (See <a href="#">DOOR KEY CYLINDER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> )
2	Door latch and lock actuator (See <a href="#">DOOR LATCH AND LOCK ACTUATOR REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> ) (See <a href="#">DOOR LOCK ACTUATOR INSPECTION [ADVANCED KEYLESS SYSTEM]</a> )
3	Trunk lid opener cancel switch (See <a href="#">TRUNK LID OPEN CANCEL SWITCH REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> )

	(See <a href="#">TRUNK LID OPEN CANCEL SWITCH INSPECTION [ADVANCED KEYLESS SYSTEM]</a> )
4	Keyless control module (See <a href="#">KEYLESS CONTROL MODULE REMOVAL/INSTALLATION [KEYLESS ENTRY SYSTEM]</a> ) (See <a href="#">KEYLESS CONTROL MODULE INSPECTION [KEYLESS ENTRY SYSTEM]</a> )
5	Trunk lid latch and opener (See <a href="#">TRUNK LID OPENER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> ) (See <a href="#">TRUNK LID OPENER INSPECTION [ADVANCED KEYLESS SYSTEM]</a> )
6	Transmitter (See <a href="#">TRANSMITTER BATTERY REPLACEMENT [KEYLESS ENTRY SYSTEM]</a> ) (See <a href="#">TRANSMITTER ID CODE REGISTRATION [KEYLESS ENTRY SYSTEM]</a> )
7	Keyless receiver (See <a href="#">KEYLESS RECEIVER REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> ) (See <a href="#">KEYLESS RECEIVER INSPECTION [KEYLESS ENTRY SYSTEM]</a> )
8	Door lock switch (See <a href="#">DOOR LOCK SWITCH REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> ) (See <a href="#">DOOR LOCK SWITCH INSPECTION [ADVANCED KEYLESS SYSTEM]</a> )
9	Trunk lid opener switch (See <a href="#">TRUNK LID OPENER SWITCH REMOVAL/INSTALLATION [ADVANCED KEYLESS SYSTEM]</a> ) (See <a href="#">TRUNK LID OPEN CANCEL SWITCH INSPECTION [ADVANCED KEYLESS SYSTEM]</a> )

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## 2008 - MX-5 - General Information

**VEHICLE IDENTIFICATION NUMBER (VIN) CODE**

**J M 1 N C 1 5 F \* 8 # 1 2 3 4 5 6**

Serial No.	0= Hiroshima 1= Hofu
Plant	8= 2008
Model year	*= 0 to 9, X
Check digit	F= 2.0 L (LF)
Engine	5= 2-door Open, Convertible Top 6= 2-door Open, Power Retractable Hardtop
Body	1= without Side air bag 2= with Side air bag
Restraint system	NC= Mazda MX-5
Carline and series	JM1= Mazda/Passenger car
World manufacturer identification	

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## 2008 - MX-5 - General Information

### VEHICLE IDENTIFICATION NUMBER (VIN)

JM1 NC15F\*8# 100001—

JM1 NC16F\*8# 100001—

JM1 NC25F\*8# 100001—

JM1 NC26F\*8# 100001—

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## 2008 - MX-5 - General Information

### HOW TO USE THIS MANUAL

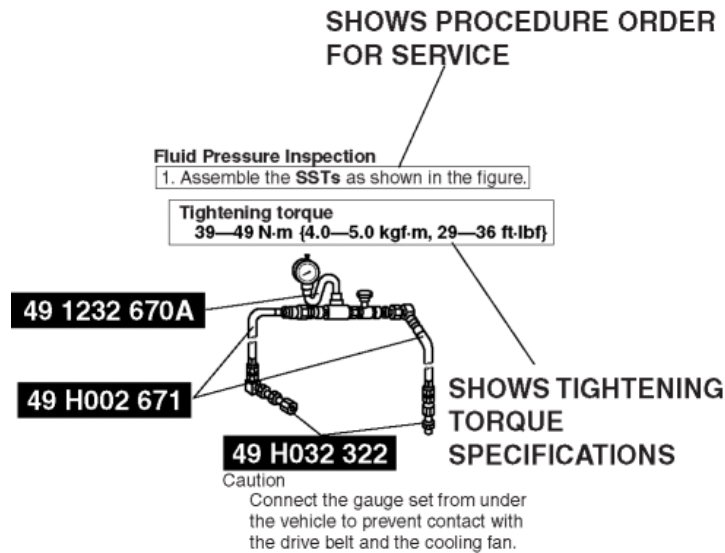
#### Range of Topics

- This manual contains procedures for performing all required service operations. The procedures are divided into the following five basic operations:
  - Removal/Installation
  - Disassembly/Assembly
  - Replacement
  - Inspection
  - Adjustment
- Simple operations which can be performed easily just by looking at the vehicle (i.e., removal/installation of parts, jacking, vehicle lifting, cleaning of parts, and visual inspection) have been omitted.

#### Service Procedure

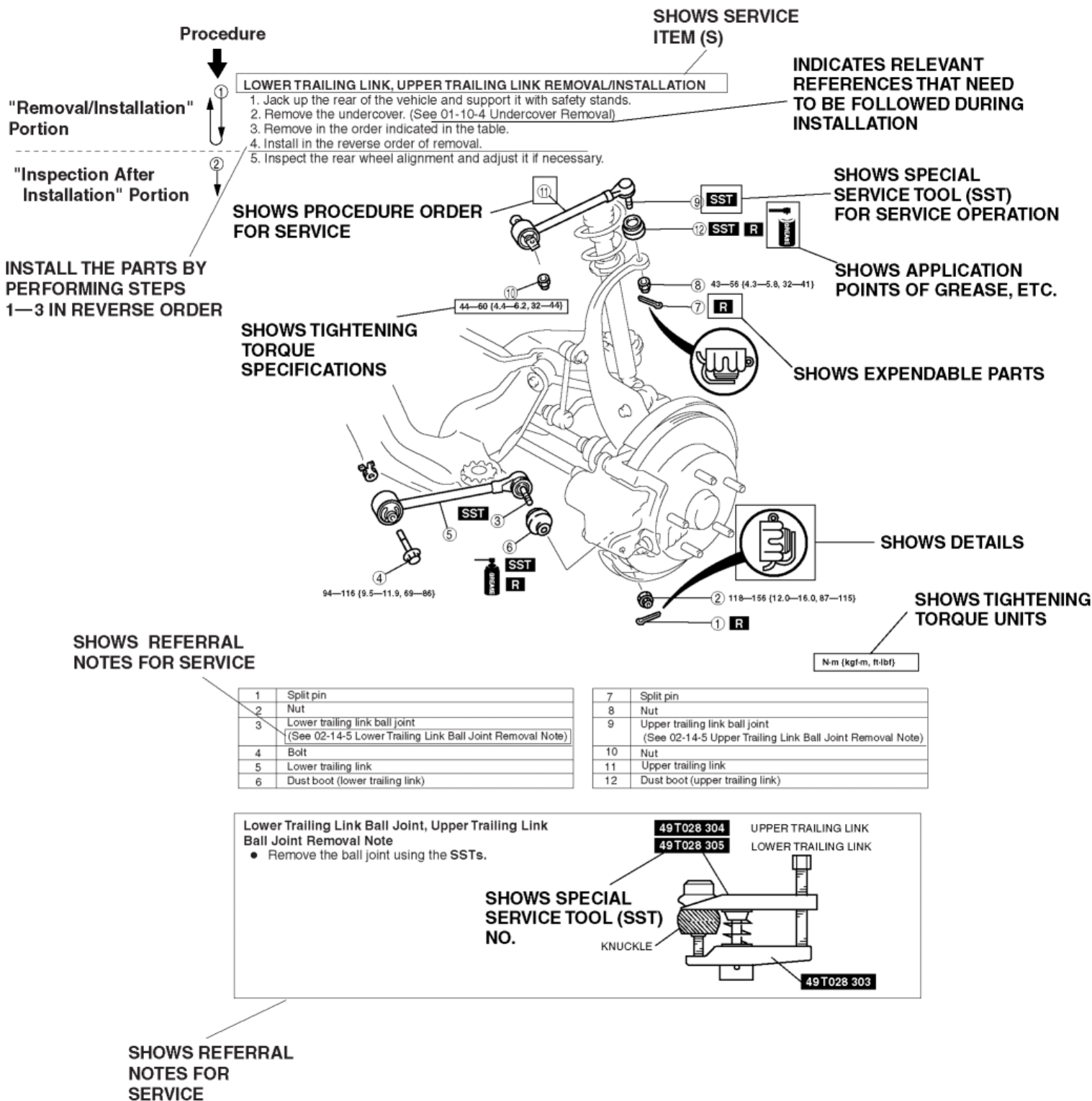
##### Inspection, adjustment

- Inspection and adjustment procedures are divided into steps. Important points regarding the location and contents of the procedures are explained in detail and shown in the illustrations.



##### Repair procedure







1. Most repair operations begin with an overview illustration. It identifies the components, shows how the parts fit together, and describes visual part inspection. However, only removal/installation procedures that need to be performed methodically have written instructions.
2. Expendable parts, tightening torques, and symbols for oil, grease, and sealant are shown in the overview illustration. In addition, symbols indicating parts requiring the use of special service tools or equivalent are also shown.
3. Procedure steps are numbered and the part that is the main point of that procedure is shown in the illustration with the corresponding number. Occasionally, there are important points or additional information concerning a procedure. Refer to this information when servicing the related part.



## Symbols

- There are eight symbols indicating oil, grease, fluids, sealant, and the use of **SST** or equivalent. These symbols show application points or use of these materials during service.

Symbol	Meaning	Kind	Symbol	Meaning	Kind
	Apply oil	New appropriate engine oil or gear oil		Apply sealant	Appropriate sealant

	Apply brake fluid	New appropriate brake fluid		Apply petroleum jelly	Appropriate petroleum jelly
	Apply automatic transaxle/transmission fluid	New appropriate automatic transaxle/transmission fluid		Replace part	O ring, gasket, etc.
	Apply grease	Appropriate grease		Use SST or equivalent	Appropriate tools

## Advisory Messages

- You will find several **Warnings**, **Cautions**, **Notes**, **Specifications** and **Upper and Lower Limits** in this manual.

### Warning

- A Warning indicates a situation in which serious injury or death could result if the warning is ignored.

### Caution

- A Caution indicates a situation in which damage to the vehicle or parts could result if the caution is ignored.

### Note

- A Note provides added information that will help you to complete a particular procedure.

### Specification

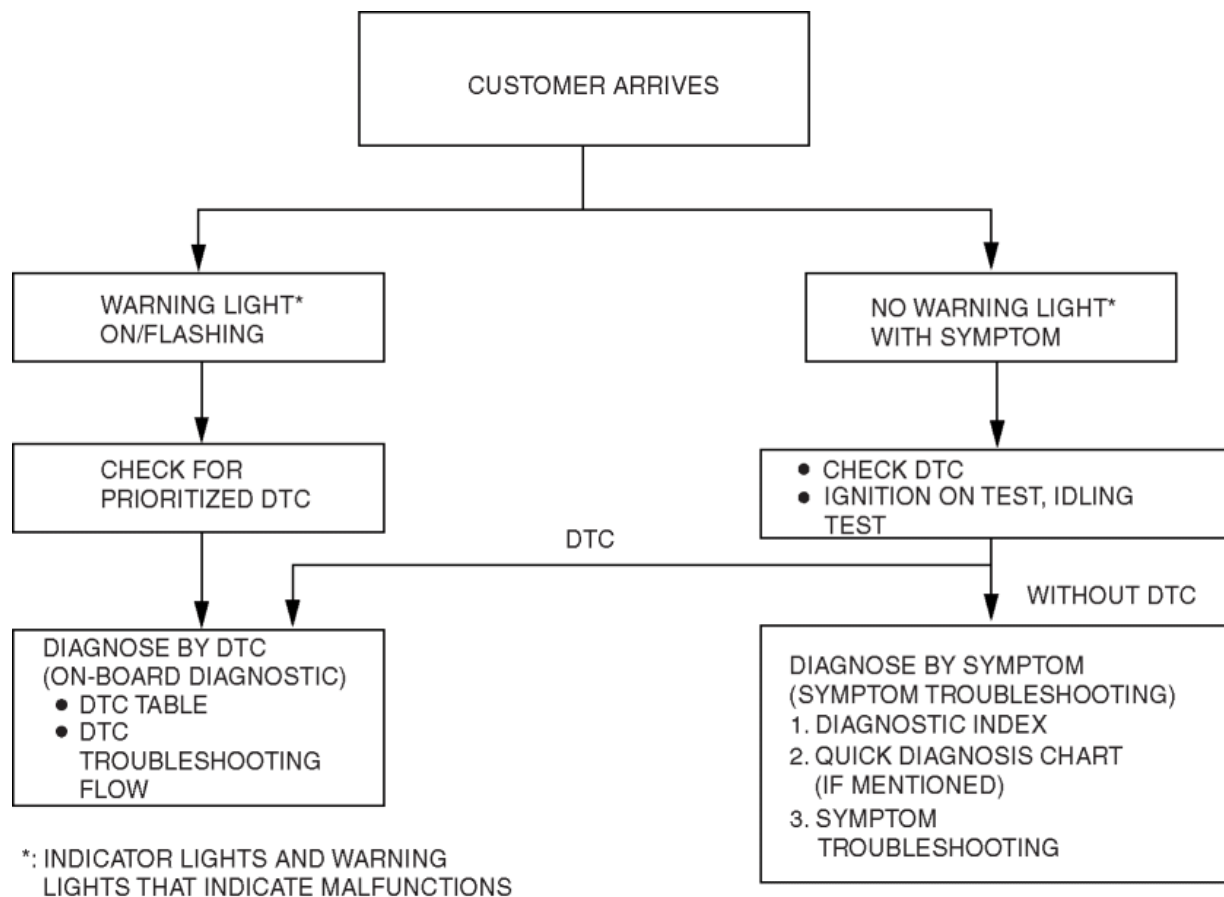
- The values indicate the allowable range when performing inspections or adjustments.

### Upper and lower limits

- The values indicate the upper and lower limits that must not be exceeded when performing inspections or adjustments.

## Troubleshooting Procedure

### Basic flow of troubleshooting



#### DTC troubleshooting flow (on board diagnostic)

- Diagnostic trouble codes (DTCs) are important hints for repairing malfunctions that are difficult to simulate. Perform the specific DTC diagnostic inspection to quickly and accurately diagnose the malfunction.
- The on board diagnostic function is used during inspection. When a DTC is shown specifying the cause of a malfunction, continue the diagnostic inspection according to the items indicated by the on board diagnostic function.

#### Diagnostic index

- The diagnostic index lists the symptoms of specific malfunctions. Select the symptoms related or most closely relating to the malfunction.

#### Quick diagnosis chart (If mentioned)

- The quick diagnosis chart lists diagnosis and inspection procedures to be performed specifically relating to the cause of the malfunction.

#### Symptom troubleshooting

- Symptom troubleshooting quickly determines the location of the malfunction according to symptom type.

### Procedures for Use

#### Using the basic inspection (section 05)

- Perform the basic inspection procedure before symptom troubleshooting.
- Perform each step in the order shown.
- The reference column lists the location of the detailed procedure for each basic inspection.



- Although inspections and adjustments are performed according to the reference column procedures, if the cause of the malfunction is discovered during basic inspection, continue the procedures as indicated in the action column.

**SHOWS INSPECTION  
ORDER**

**SHOWS ITEM NAMES FOR  
DETAILED PROCEDURES**

**SHOW POINTS REQUIRING  
ATTENTION BASED ON  
INSPECTION RESULTS**

**AUTOMATIC TRANSAXLE BASIC INSPECTION**

STEP	INSPECTION	ACTION	
1	<ul style="list-style-type: none"> <li>Turn ignition switch is on.</li> <li>Does O/D OFF indicator light (illuminate/go out) correspond to O/D OFF switch position (on/off)?</li> </ul>	Yes	Go to next step.
		No	Perform symptom troubleshooting No.26 "O/D OFF indicator light does not illuminate when O/D OFF switch is turned to on", or No.27 "O/D OFF indicator light illuminates when O/D OFF switch is not turned to on"
2	<ul style="list-style-type: none"> <li>Turn ignition switch is on.</li> <li>When selector lever is moved, are selector lever position and indicator aligned? Also, when other ranges are selected from N or P during idling, does vehicle creep within 1 to 2 seconds?</li> </ul>	Yes	Go to next step.
		No	Inspect selector lever.  Repair or replace defective areas.
3	<ul style="list-style-type: none"> <li>Inspect the ATF color condition. (See 05-17-8 Automatic Transaxle Fluid (ATF) Condition Inspection)</li> <li>Are ATF color and odor normal?</li> </ul>	Yes	Go to next step.
		No	Repair or replace any defective parts according to inspection result. Flush ATX and cooler line as necessary.
4	<ul style="list-style-type: none"> <li>Perform line pressure test. (See 05-17-2 Line Pressure Test)</li> <li>Is line pressure okay?</li> </ul>	Yes	Go to next step.
		No	Adjust accelerator cable as necessary. Repair or replace any defective parts according to inspection result.
5	<ul style="list-style-type: none"> <li>Perform stall test.</li> <li>Is stall speed is okay?</li> </ul>	Yes	Go to next step.
		No	Repair or replace defective parts according to inspection result.

**REFERENCE  
COLUMN**

**Using the DTC troubleshooting flow**

- DTC troubleshooting flow shows diagnostic procedures, inspection methods, and proper action to take for each DTC.

**DTC P0103**

**POSSIBLE CAUSE describes possible point(s) of malfunction**

**Indicates the inspection step No. to be performed (01 and 05 section)**

**STEP shows the order of troubleshooting**

**INSPECTION describes the method to quickly determine the failed part(s).**

**TROUBLE CONDITION**

**DETECTION CONDITION describes the condition under which the DTC is detected.**

**Indicates the circuit to be inspected (01 and 05 section)**

**Indicates the connector related to the inspection**

**ACTION describes the appropriate action to take as according to the result (Yes/No).**

**Reference item(s) to perform ACTION.**

**DTC P0103**

**MAF circuit high input**

PCM monitors input voltage from TP sensor after ignition key is turned on. If input voltage at PCM terminal 68 is above 8.25 V, PCM determines that TP circuit has malfunction.

**DETECTION CONDITION**

**Diagnostic support note**

- This is a continuous monitor (CCM).
- MIL illuminates if PCM detects the above malfunction during first drive cycle. Therefore, PENDING CODE is not available.
- FREEZE FRAME DATA is available.
- DTC is stored in the PCM memory.

**POSSIBLE CAUSE**

- MAF sensor malfunction
- Connector or terminal malfunction
- Open circuit in wiring between MAF sensor terminal D and PCM terminal 36
- Open circuit in MAF sensor ground circuit

MAF SENSOR HARNESS SIDE CONNECTOR

PCM HARNESS SIDE CONNECTOR

**Diagnostic procedure**

STEP	INSPECTION		ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>• Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes	Go to next step.
		No	Record FREEZE FRAME DATA on repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>• Are related Service Bulletins and/or on-line repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to available repair information. If vehicle is not repaired, then go to next step.
		No	Go to next step.
3	<b>VERIFY CURRENT INPUT SIGNAL STATUS IS CONCERN INTERMITTENT OR CONSTANT</b> <ul style="list-style-type: none"> <li>• Connect WDS to DLC-2.</li> <li>• Start engine.</li> <li>• Access MAF V PID using WDS.</li> <li>• Is MAF V PID within 0.2 - 8.3 V?</li> </ul>	Yes	Intermittent concern is existing. Go to INTERMITTENT CONCERNS TROUBLESHOOTING procedure. (See 01-03-33 INTERMITTENT CONCERN TROUBLESHOOTING)
		No	Go to next step.
4	<b>INSPECT POOR CONNECTION OF MAF SENSOR CONNECTOR</b> <ul style="list-style-type: none"> <li>• Turn ignition key to OFF.</li> <li>• Disconnect MAF sensor connector.</li> <li>• Check for poor connection (damaged, pulled-out terminals, corrosion etc.).</li> <li>• Are there any malfunctions?</li> </ul>	Yes	Repair or replace terminals, then go to Step 8.

#### Using the diagnostic index

- The symptoms of the malfunctions are listed in the diagnostic index for symptom troubleshooting.
- The exact malfunction symptoms can be selected by following the index.

No.	TROUBLESHOOTING ITEM		DESCRIPTION	Page
1	Melting of main or other fuses		—	(See 01-03-6 MELT NO.1 MAIN OR OTHER FUSE)
2	MIL comes on		MIL is illuminated incorrectly.	(See 01-03-7 NO.2 MIL COMES ON)
3	Will not crank		Starter does not work.	(See 01-03-8 NO. 3 WILL NOT CRANK)
4	Hard start/long crank/erratic start/erratic crank		Starter cranks engine at normal speed but engine requires excessive cranking time before starting.	(See 01-03-9 NO. 4 HARD START/ LONG CRANK/ERRATIC CRANK)
5	Engine stalls.	After start/at idle	Engine stops unexpectedly at idle and/or after start.	(See 01-03-11 NO. 5 ENGINE-STALLS AFTER START/AT IDLE)
6	Crankes normally but will not start		Starter cranks engine at normal speed but engine will not run.	(See 01-03-15 NO.6 CRANKS NORMALLY BUT WILL NOT START)
7	Slow return to idle		Engine takes more time than normal to return to idle speed.	(See 01-03-19 NO. 7 SLOW RERUN TO IDLE)
8	Engine runs rough/rotling		Engine speed fluctuates between specified idle speed and lower speed and engine shakes excessively.	(See 01-03-20 NO. 8 ENGINE RUNS ROUGH/ROLLING IDLE )
9	Fast idle/runs on		Engine speed continues at fast idle after warm-up. Engine runs after ignition key is turned to OFF.	(See 01-03-23 NO. 9 FAST IDLE/RUNS ON)
10	Low idle/stalls during deceleration		Engine stops unexpectedly at beginning of deceleration or recovery from deceleration.	(See 01-03-24 NO. 10 LOW IDLE/ STALLS DURING DECELERATION)

#### Using the quick diagnosis chart

- The chart lists the relation between the symptom and the cause of the malfunction.
- The chart is effective in quickly narrowing down the relation between symptom and cause of the malfunction. It also specifies the area of the common cause when multiple malfunction symptoms occur.
- The appropriate diagnostic inspection relating to malfunction cause as specified by the symptoms can be selected by looking down the diagnostic inspection column of the chart.

## PARTS WHICH MAY BE THE CAUSE OF PROBLEMS

X: Applied

PART WHICH MAY BE  
THE SYMPTOM

CHOOSE THE  
ACTUAL SYMPTOM

		Possible factor																						
		Starter motor malfunction (Mechanical or electrical)	Starter circuit including ignition switch is open.	Starter interlock switch malfunction (MTX)	Improper engine oil level	Low or dead battery	Charging system malfunction	Improper engine compression	Improper valve timing	Hydrolocked engine	Improper engine oil viscosity	Improper dipstick	Base engine malfunction	Drive plate or flywheel are seized.	Improper tension or damaged drive belts	Improper engine coolant level	Water and anti-freeze mixture is improper.	Cooling system malfunction (Radiator, hoses, overflow system, thermostat, etc.)	Cooling fan system malfunction	Engine or transaxle mounts are improperly installed.	Cooling fan or condenser fan seat are improper.	Accelerator position sensor misadjustment	Cruise control system operation improperly	Fuel quality
Troubleshooting item																								
1	Melting of main or other fuses																							
2	MIL illuminates																							
3	Will not crank	x	x	x		x	x			x				x										
4	Hard to start/long crank/erratic start/erratic crank	x																						x
5	Engine stalls. After start/at idle							x	x															x
6	Cranks normally but will not start							x	x															x
7	Slow return to idle																	x						
8	Engine runs rough/rolling idle							x	x															x
9	Fast idle/runs on																					x	x	
10	Low idle/stalls during deceleration																					x		
11	Engine stalls/quits. Acceleration/cruise							x	x													x		x
	Engine runs rough. Acceleration/cruise							x	x															x
	Misses. Acceleration/cruise							x	x															x
	Buck/jerk. Acceleration/cruise/ deceleration							x	x															x
	Hesitation/stumble. Acceleration							x	x															x
	Surges. Acceleration/cruise							x	x															x
12	Lack/loss of power. Acceleration/cruise							x	x															x
13	Knocking/pinging. Acceleration/cruise							x										x						
14	Poor fuel economy							x	x									x	x					x
15	Emission compliance							x	x				x					x						
16	High oil consumption/leakage										x	x	x											
17	Cooling system concerns. Overheating														x	x	x	x	x					
18	Cooling system concerns. Runs cold																		x	x				
19	Exhaust smoke							x					x					x						
20	Fuel odor (in engine compartment)																							
21	Engine noise				x								x		x									
22	Vibration concerns (engine)														x					x	x			
23	A/C does not work sufficiently.																							
24	A/C is always on or A/C compressor runs continuously.																							
25	A/C is not cut off under WOT conditions.																					x		
26	Exhaust sulfur smell																							x
27	Fuel refill concerns																							
28	Fuel filling shut off issues																							
29	Constant voltage																							
30	Spark plug condition							x																
31	ATX concerns. Upshift/downshift engagement																							
		See Section 05-03A, TROUBLESHOOTING																						

See Section 05-03A, TROUBLESHOOTING

### Using the symptom troubleshooting

- Symptom troubleshooting shows diagnostic procedures, inspection methods, and proper action to take for each trouble symptom.

**DESCRIPTION**  
describes what  
kind of TROUBLE  
SYMPTOM

**TROUBLE SYMPTOM**

**POSSIBLE  
CAUSE**  
describes  
possible  
point of  
malfunction

**STEP** shows  
the order of  
troubleshooting.

**Reference  
item(s) for  
additional  
information  
to perform  
INSPECTION.**

**INSPECTION**  
describes the  
method to  
quickly  
determine the  
failed part.

**ACTION**  
describes the  
appropriate  
action to take  
as a result  
(YES/NO) of  
INSPECTION.

**How to  
perform  
ACTION is  
described in  
the relative  
material  
shown.**

**Reference  
item(s) to  
perform  
ACTION.**

14	<b>Engine flares up or slips when upshifting or down shifting</b>
<b>DESCRIPTION</b>	<ul style="list-style-type: none"> <li>When accelerator pedal is depressed for driveway, engine speed increase but vehicle speed increase slowly.</li> <li>When accelerator is depressed while driving, engine speed increases but vehicle not.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>There is clutch slip because clutch is stuck or line pressure is low. <ul style="list-style-type: none"> <li>Clutch stuck, slippage (forward clutch, 3-4 clutch, 2-4 brake band, one-way clutch 1, one-way clutch 2) <ul style="list-style-type: none"> <li>Line pressure low</li> <li>Malfunction or mis-adjustment of TP sensor</li> <li>Malfunction of VSS</li> <li>Malfunction of input/turbine speed sensor</li> <li>Malfunction of sensor ground</li> <li>Malfunction of shift solenoid A, B or C</li> <li>Malfunction of TCC solenoid valve</li> <li>Malfunction of body ground</li> <li>Malfunction of throttle cable</li> <li>Malfunction of throttle valve body</li> </ul> </li> </ul> </li> <li>Poor operating of mechanical pressure <ul style="list-style-type: none"> <li>Selector lever position disparity</li> <li>TR switch position disparity</li> </ul> </li> </ul> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>Before following troubleshooting steps, make sure that Automatic Transaxle On-board Diagnostic and Automatic Transaxle Basic Inspection are conducted.</li> </ul>

Diagnostic procedure			
STEP	INSPECTION		ACTION
1	Is line pressure okay?	Yes	Go to next step.
		No	Repair or replace any defective parts according to inspection results.
2	Is shift point okay? (See 05-17-5 ROAD TEST)	Yes	Go to next step
		No	Go to symptom troubleshooting No.9 "Abnormal shift".
3	<ul style="list-style-type: none"> <li>Stop engine and turn ignition switch on.</li> <li>Connect WDS to DLC-2.</li> <li>Simulate SHIFT A, SHIFT B and SHIFT C PIDs for ON.</li> <li>Is operating sound of shift solenoids heard?</li> </ul>	Yes	<ul style="list-style-type: none"> <li>Overhaul control valve body and repair or replace any defective parts. (See ATX Workshop Manual GF4A-EL (1666-1A-99F))</li> <li>If problem remains, replace or overhaul transaxle and repair or replace defective parts. (See 05-17-15 AUTOMATIC TRANSAXLE REMOVEVAL/INSTALLATION)</li> </ul>
		No	<ul style="list-style-type: none"> <li>Inspect for bend, damage, corrosion or loose connection if shift solenoid A, B, or C terminal on ATX.</li> <li>Inspect for shift solenoid mechanical stuck. (See 05-17-14 Inspection of Operation)</li> <li>If shift solenoids are okay, inspect for open or short circuit between PCM connector terminal A, B or C.</li> </ul>
4	<ul style="list-style-type: none"> <li>Verify test results. <ul style="list-style-type: none"> <li>If okay, return to diagnostic index to service any additional symptoms.</li> <li>If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.</li> <li>If vehicle is repaired, troubleshooting completed.</li> <li>If vehicle is not repaired or additional diagnostic information is not available, replace or reprogram PCM.</li> </ul> </li> </ul>		

## 2008 - MX-5 - General Information

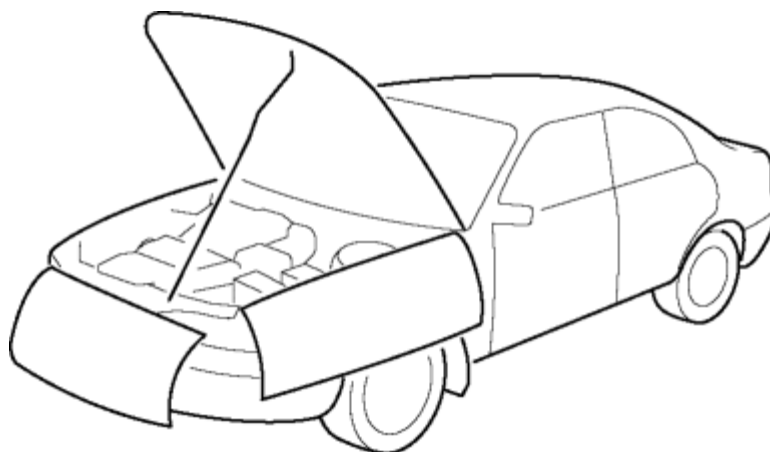
### SERVICE CAUTIONS

#### Injury/damage Prevention Precautions

- Depending on the vehicle, the cooling fan may operate suddenly even when the ignition switch is turned off. Therefore, keep hands and tools away from the cooling fan even if the cooling fan is not operating to prevent injury to personnel or damage to the cooling fan. Always disconnect the negative battery cable when servicing the cooling fan or parts near the cooling fan.

#### Protection of the Vehicle

- Always be sure to cover fenders, seats and floor areas before starting work.



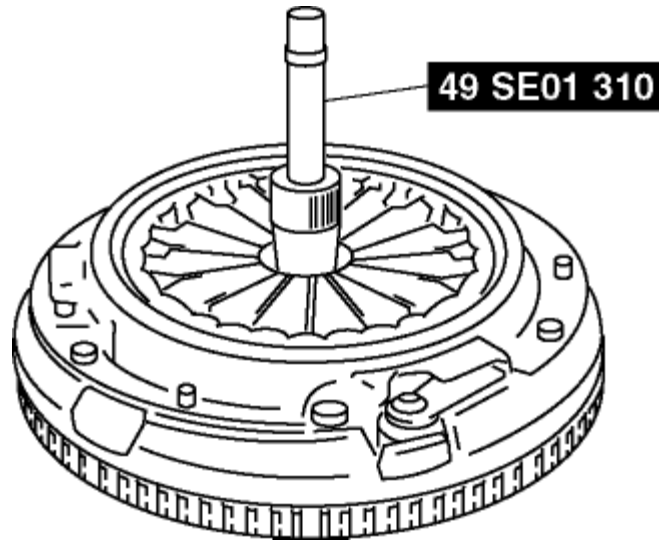
#### Preparation of Tools and Measuring Equipment

- Be sure that all necessary tools and measuring equipment are available before starting any work.



### Special Service Tools

- Use special service tools or equivalent when they are required.



### Malfunction Diagnosis System

- Use the Mazda modular diagnostic system (M-MDS) or equivalent for malfunction diagnosis.

### Disconnection of the Negative Battery Cable

- When working with the negative battery cable disconnected, wait for 1 min or more to allow the back up power supply of the SAS control module to deplete its stored power after the cable is disconnected.
- Disconnecting the battery cable will delete the memories of the clock, audio, and DTCs, etc. Therefore, it is necessary to note down the information stored in those memories before disconnecting the cable.

### WARNING:

- For vehicle with DSC, if the negative battery cable is disconnected, the stored initial



position of the steering angle sensor will be cleared and the DSC will not operate properly, making the vehicle unsafe to drive. Perform the steering angle sensor initialization procedure after connecting the negative battery cable. (See **STEERING ANGLE SIGNAL INITIALIZATION PROCEDURE**.)

## Oil Leakage Inspection

- Use either of the following procedures to identify the type of oil that is leaking:

### Using UV light (black light)

1. Remove any oil on the engine or transaxle/transmission.

#### NOTE:

- Referring to the fluorescent dye instruction manual, mix the specified amount of dye into the engine oil or ATF (or transaxle/transmission oil).
2. Pour the fluorescent dye into the engine oil or ATF (or transaxle/transmission oil).
  3. Allow the engine to run for 30 min.
  4. Inspect for dye leakage by irradiating with UV light (black light), and identify the type of oil that is leaking.
  5. If no dye leakage is found, allow the engine to run for another 30 min. or drive the vehicle then reinspect.
  6. Find where the oil is leaking from, then make necessary repairs.

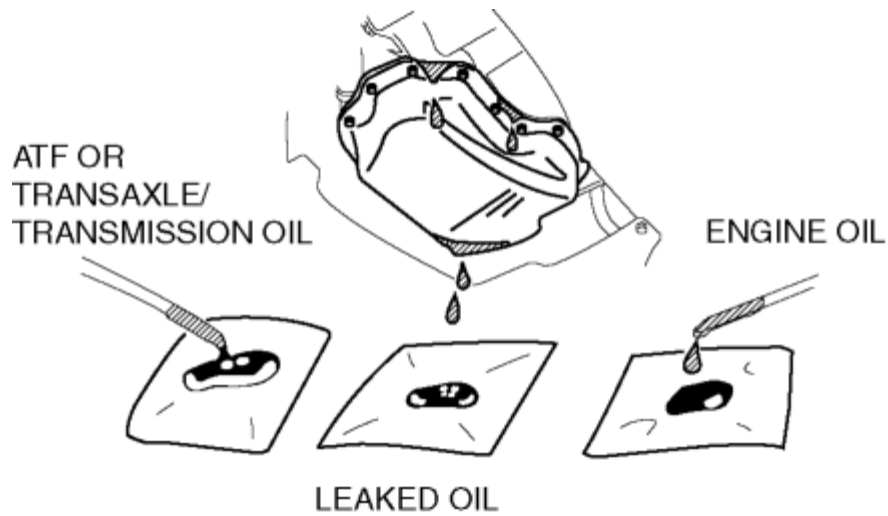
#### NOTE:

- To determine whether it is necessary to replace the oil after adding the fluorescent dye, refer to the fluorescent dye instruction manual.

### Not using UV light (black light)

1. Gather some of the leaking oil using an absorbent white tissue.
2. Take samples of engine oil and ATF (or transaxle/transmission oil), both from the dipstick, and place them next to the leaked oil already gathered on the tissue.
3. Compare the appearance and smell, and identify the type of oil that is leaking.

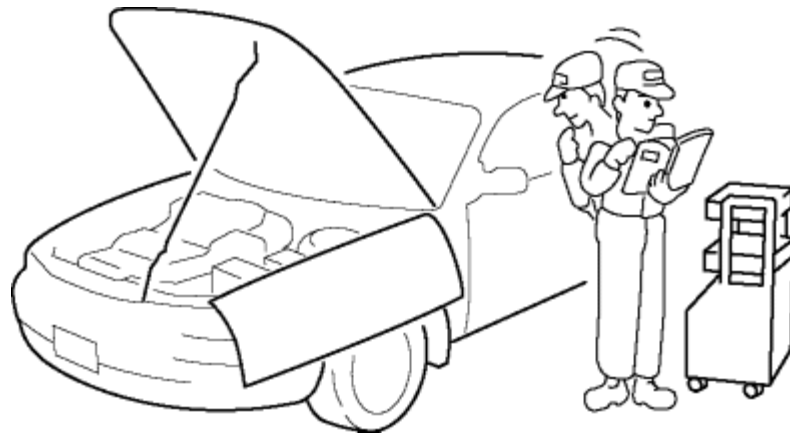




4. Remove any oil on the engine or transaxle/transmission.
5. Allow the engine to run for 30 min.
6. Check the area where the oil is leaking, then make necessary repairs.

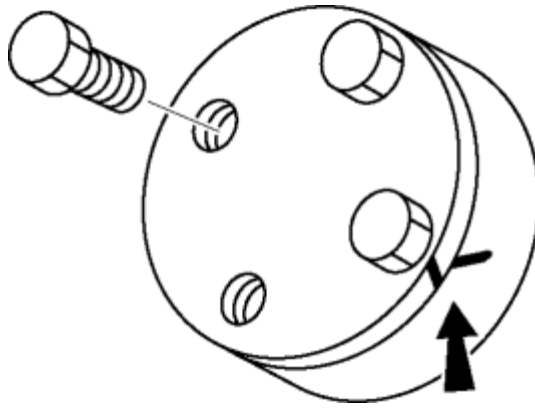
## Removal of Parts

- While correcting a problem, also try to determine its cause. Begin work only after first learning which parts and subassemblies must be removed and disassembled for replacement or repair. After removing the part, plug all holes and ports to prevent foreign material from entering.



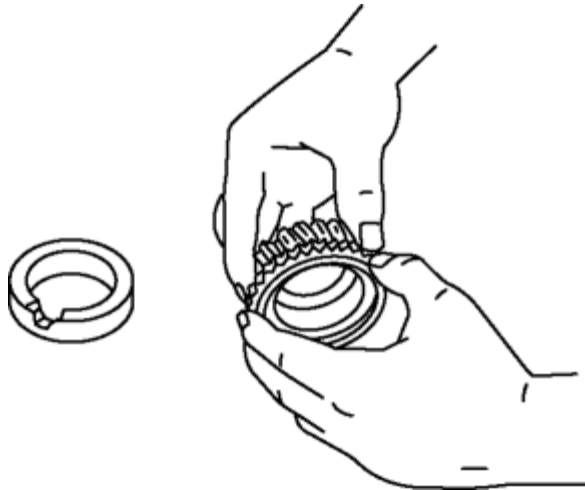
## Disassembly

- If the disassembly procedure is complex, requiring many parts to be disassembled, all parts should be marked in a place that will not affect their performance or external appearance and identified so that reassembly can be performed easily and efficiently.



### Inspection During Removal, Disassembly

- When removed, each part should be carefully inspected for malfunction, deformation, damage and other problems.



### Arrangement of Parts

- All disassembled parts should be carefully arranged for reassembly.



- Be sure to separate or otherwise identify the parts to be replaced from those that will be reused.

## Cleaning of Parts

- All parts to be reused should be carefully and thoroughly cleaned in the appropriate method.

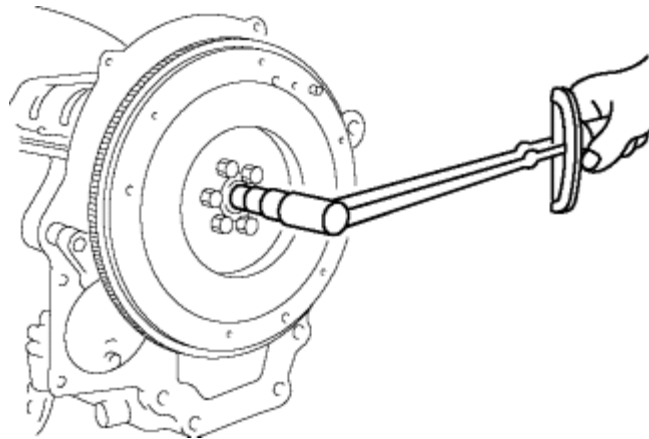


### WARNING:

- Using compressed air can cause dirt and other particles to fly out causing injury to the eyes. Wear protective eye wear whenever using compressed air.

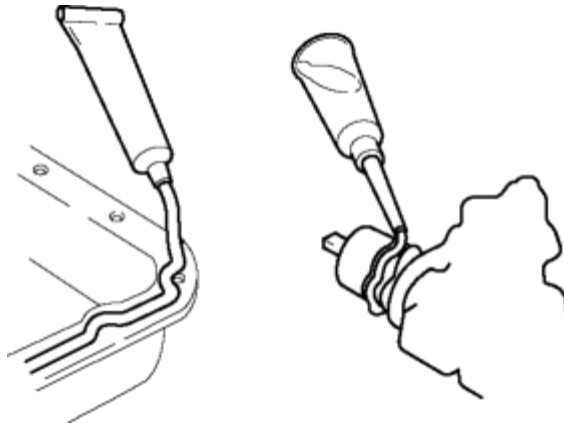
## Reassembly

- Standard values, such as torques and certain adjustments, must be strictly observed in the reassembly of all parts.



- If removed, these parts should be replaced with new ones:
  - Oil seals
  - Gaskets
  - O rings
  - Lock washers
  - Cotter pins
  - Nylon nuts

- Depending on location:



- Sealant and gaskets, or both, should be applied to specified locations. When sealant is applied, parts should be installed before sealant hardens to prevent leakage.
- Oil should be applied to the moving components of parts.
- Specified oil or grease should be applied at the prescribed locations (such as oil seals) before reassembly.

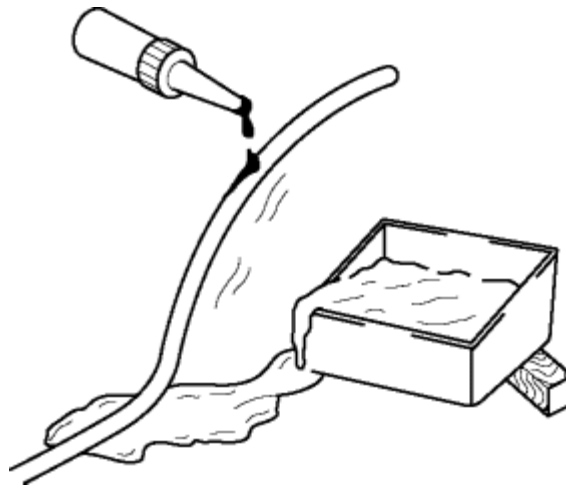
## Adjustment

- Use suitable gauges and testers when making adjustments.



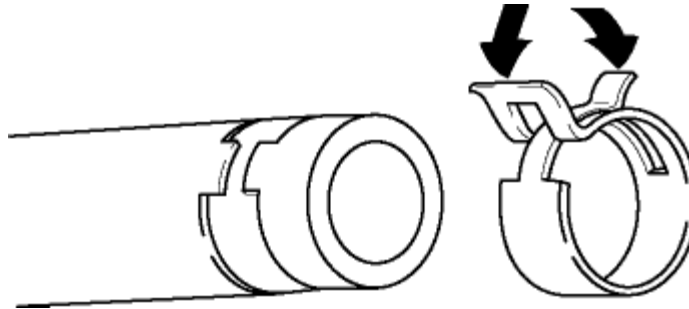
## Rubber Parts and Tubing

- Prevent gasoline or oil from getting on rubber parts or tubing.



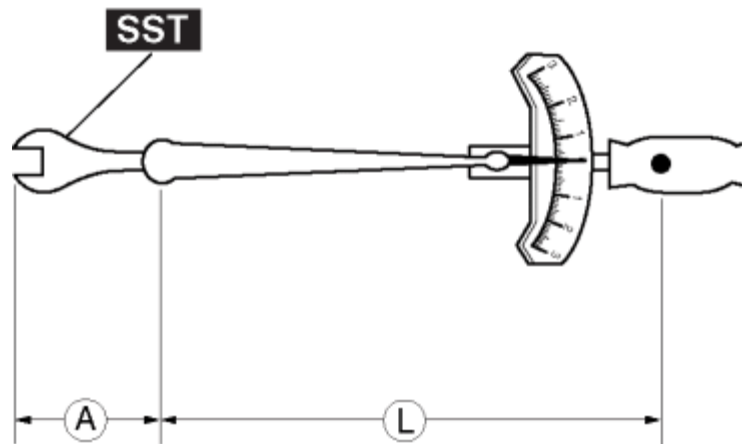
## Hose Clamps

- When reinstalling, position the hose clamp in the original location on the hose and squeeze the clamp lightly with large pliers to ensure a good fit.



## Torque Formulas

- When using a torque wrench **SST** or equivalent combination, the written torque must be recalculated due to the extra length that the **SST** or equivalent adds to the torque wrench. Recalculate the torque by using the following formulas. Choose the formula that applies to you.



Torque Unit	Formula
N·m	$N \cdot m \times [L/(L+A)]$
kgf·m	$kgf \cdot m \times [L/(L+A)]$
kgf·cm	$kgf \cdot cm \times [L/(L+A)]$
ft·lbf	$ft \cdot lbf \times [L/(L+A)]$
in·lbf	$in \cdot lbf \times [L/(L+A)]$

A

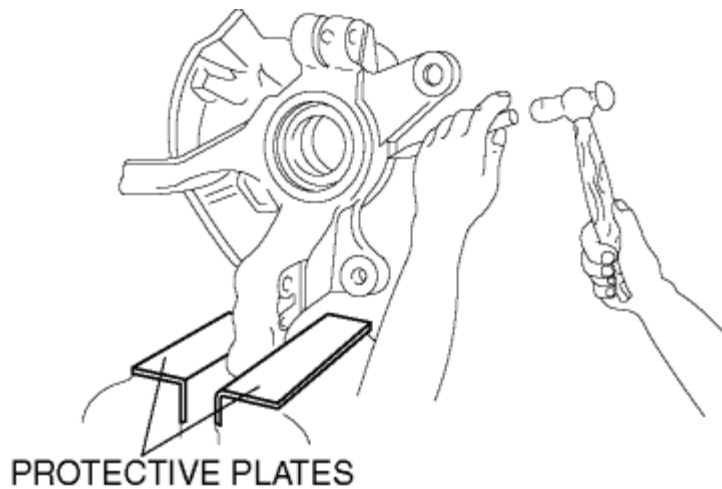
**The length of the SST past the torque wrench drive.**

L

**The length of the torque wrench.**

## Vise

- When using a vise, put protective plates in the jaws of the vise to prevent damage to parts.



## Dynamometer

- When inspecting and servicing the power train on the dynamometer or speed meter tester, pay attention to the following:
  - Place a fan, preferably a vehicle speed proportional type, in front of the vehicle.
  - Make sure the vehicle is in a facility with an exhaust gas ventilation system.
  - Since the rear bumper might deform from the heat, cool the rear with a

fan. (Surface of the bumper must be below **70°C {158°F} degrees.**)

- Keep the area around the vehicle uncluttered so that heat does not build up.
- Watch the water temperature gauge and don't overheat the engine.
- Avoid added load to the engine and maintain normal driving conditions as much as possible.

#### NOTE:

- When only the front or rear wheels are rotated on a chassis dynamometer or equivalent, the ABS/DSC CM determines that there is a malfunction in the ABS/DSC and illuminates the following lights:
  - Vehicles with ABS
    - ABS warning light
    - Brake system warning light
  - Vehicles with DSC
    - ABS warning light
    - Brake system warning light
    - DSC indicator light
- If the above lights are illuminated, dismount the vehicle from the chassis dynamometer and turn the ignition switch to the LOCK position. Then, turn the ignition switch back to the ON position, run the vehicle at 10 km/h or more and verify that the warning lights go out. In this case, a DTC will be stored in the memory. Clear the DTC from the memory by following the memory clearing procedure [ABS]/[DSC] in the on-board diagnostic system. (See **ON-BOARD DIAGNOSIS [ABS].**), (See **ON-BOARD DIAGNOSIS [DYNAMIC STABILITY CONTROL (DSC)].**)

#### SST

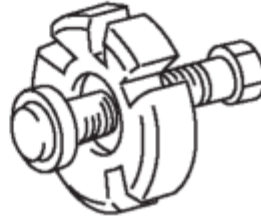
- Some global **SST** or equivalent are used as **SSTs** necessary for engine repair. Note that these **SSTs** are marked with global **SST** numbers.
- Note that a global **SST** number is written together with a corresponding Mazda **SST** number as shown below.

Example (section 01-60)

1: 49 UN303 009

2: 303-009

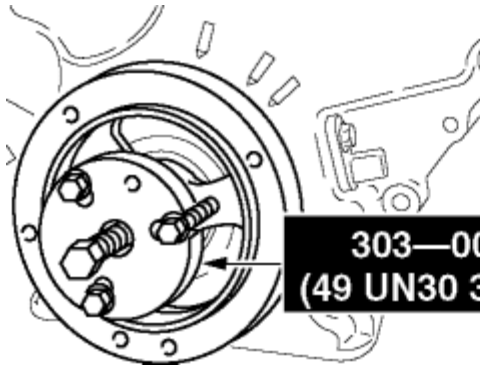
Crankshaft Damper Remover



1: Mazda **SST** number

2: Global **SST** number

Example (except section 01-60)



**303—009**  
**(49 UN30 3009)**

—Global SST Number

—Mazda SST Number

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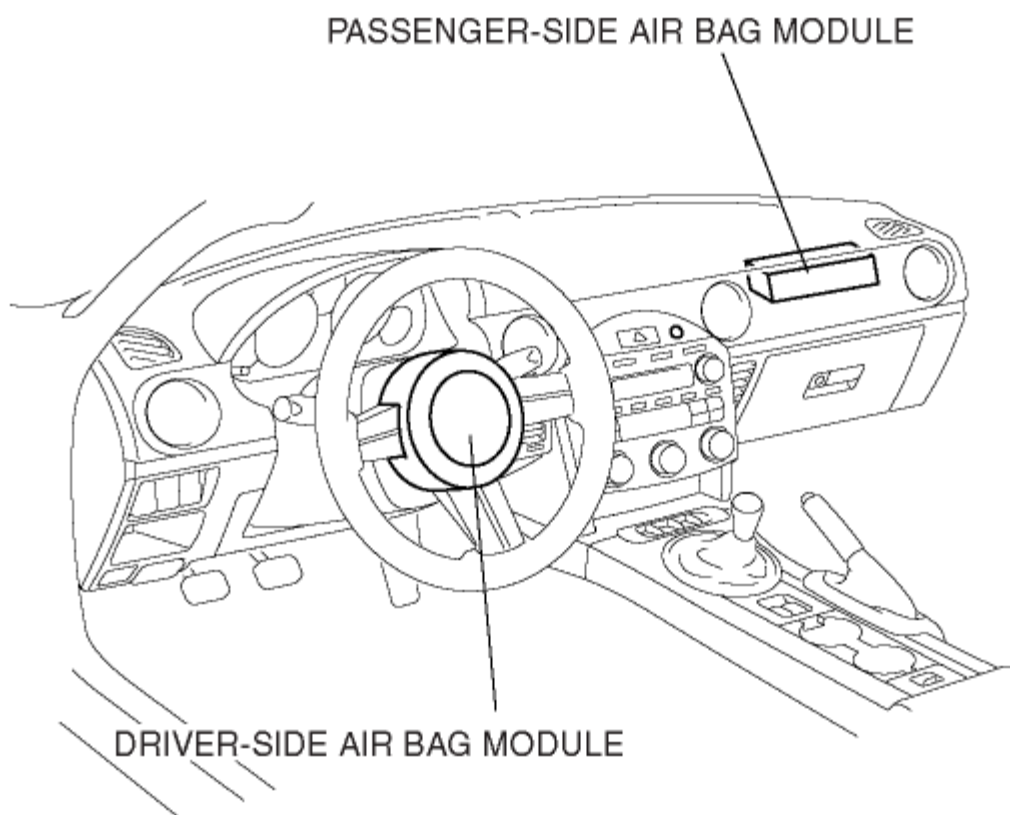
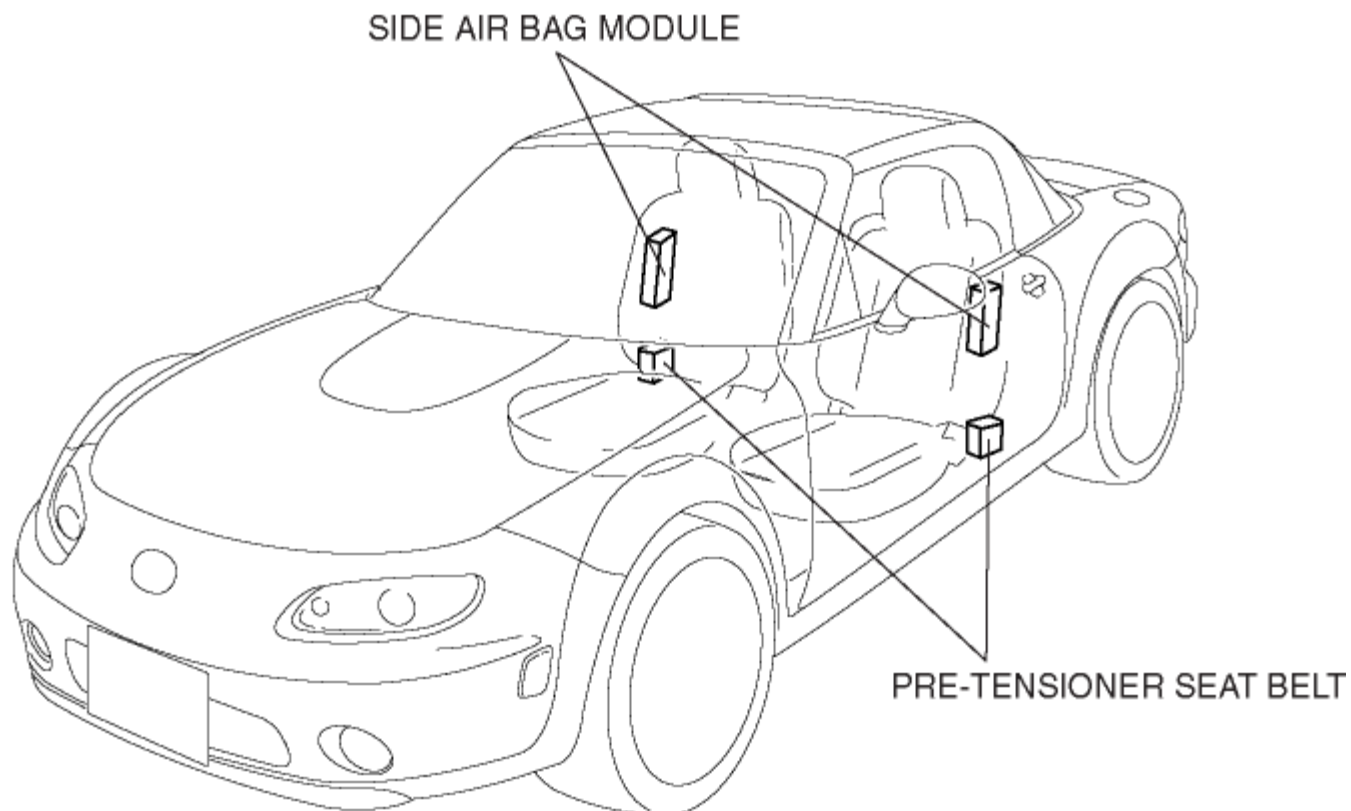


## 2008 - MX-5 - General Information

### INSTALLATION OF RADIO SYSTEM

The control module and control unit have been designed with sufficient attention to radio wave disturbances from the outside. However, observe the following precautions when installing the radio set to the vehicle to prevent adverse effects on the control module and control unit.

- Install the radio set and its antenna as far away as possible from the control module and control unit.
- The antenna feeder and power cable generate radio waves, therefore, keep them 100 mm or more from the control module, control unit, and wiring harness. If the antenna feeder and power cable cross over the wiring harness, place them perpendicular to the wiring harness.
- Do not install a high output radio set.
- Do not use the control module and control unit power source for the radio set. In addition, do not use the cigar lighter and accessory socket power source.
- Do not attach the antenna feeder or wiring harness of the radio set to the wiring harness, fuel pipe, or brake tube of the vehicle.
- Do not install any radio set-related devices in the area where the air bag module deploys to prevent a secondary accident if the air bag were to deploy.



- After installing the radio set, perform a test transmission with the engine idling to verify that it does not affect engine control.



## 2008 - MX-5 - General Information

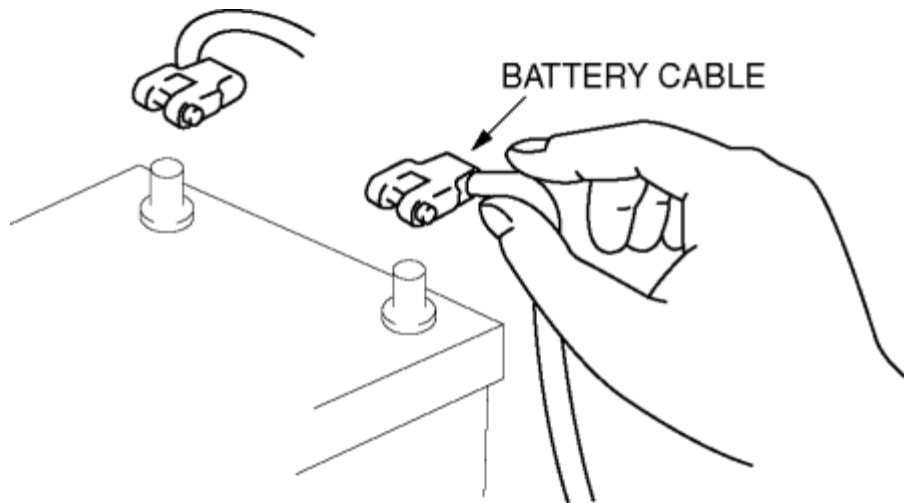
### ELECTRICAL SYSTEM

#### Electrical Parts

##### Battery cable

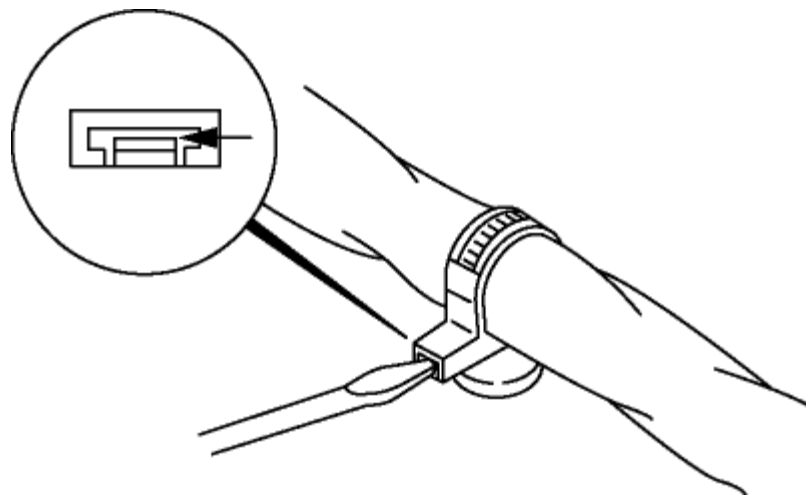
- Before disconnecting connectors or removing electrical parts, disconnect the negative battery cable.

(See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)



#### Wiring Harness

- To remove the wiring harness from the clip in the engine room, pry up the hook of the clip using a flathead screwdriver.



NO GOOD



#### CAUTION:

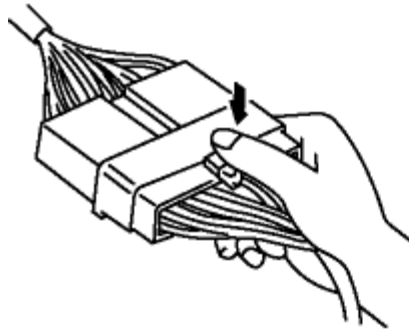
- Do not remove the harness protective tape. Otherwise, the wires could rub against the body, which could result in water penetration and electrical shorting.

#### Connectors

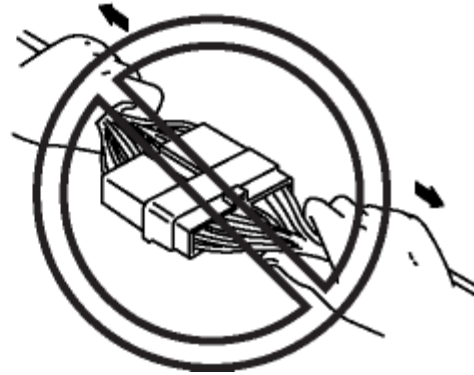
##### Disconnecting connectors

- When disconnecting connector, grasp the connectors, not the wires.

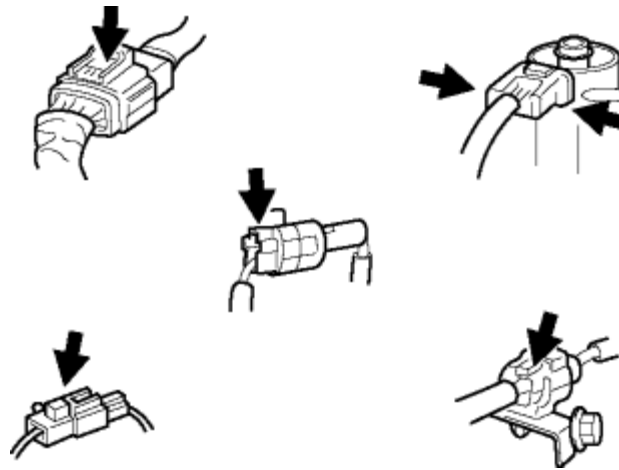
GOOD



NO GOOD

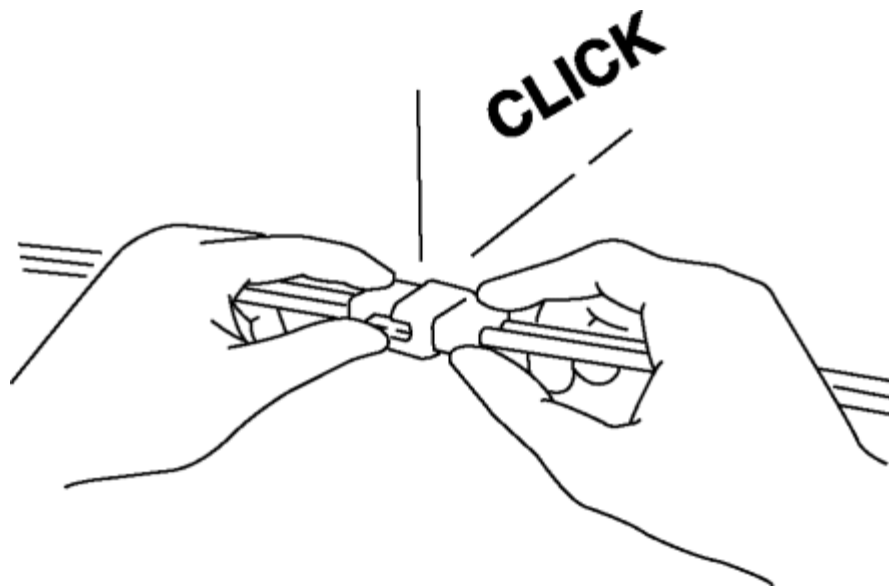


- Connectors can be disconnected by pressing or pulling the lock lever as shown.



### Locking connector

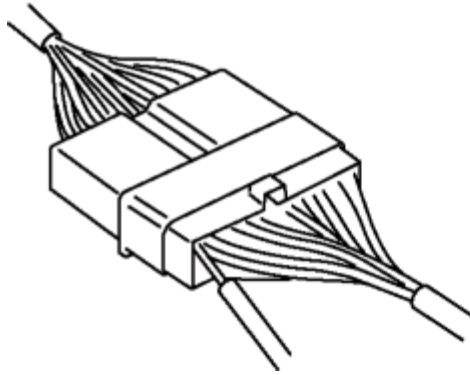
- When locking connectors, listen for a click indicating they are securely locked.



### Inspection

- When a tester is used to inspect for continuity or measuring voltage, insert the tester probe from the wiring harness side.

GOOD

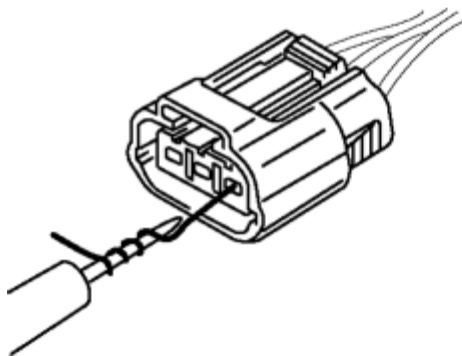


NO GOOD

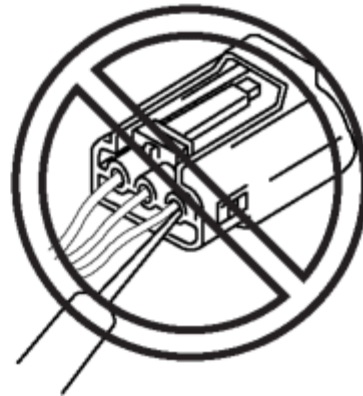


- Inspect the terminals of waterproof connectors from the connector side since they cannot be accessed from the wiring harness side.

GOOD



NO GOOD



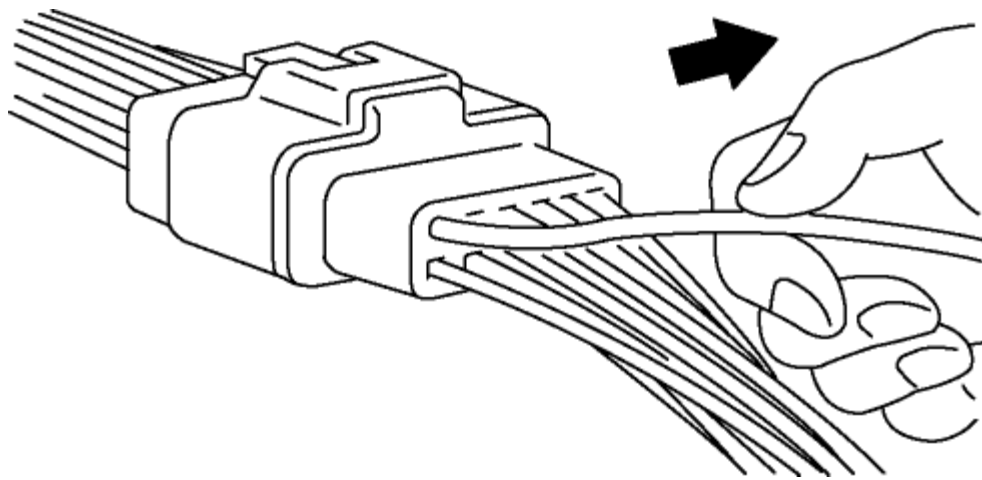
#### CAUTION:

- To prevent damage to the terminal, wrap a thin wire around the tester probe before inserting into terminal.

#### Terminals

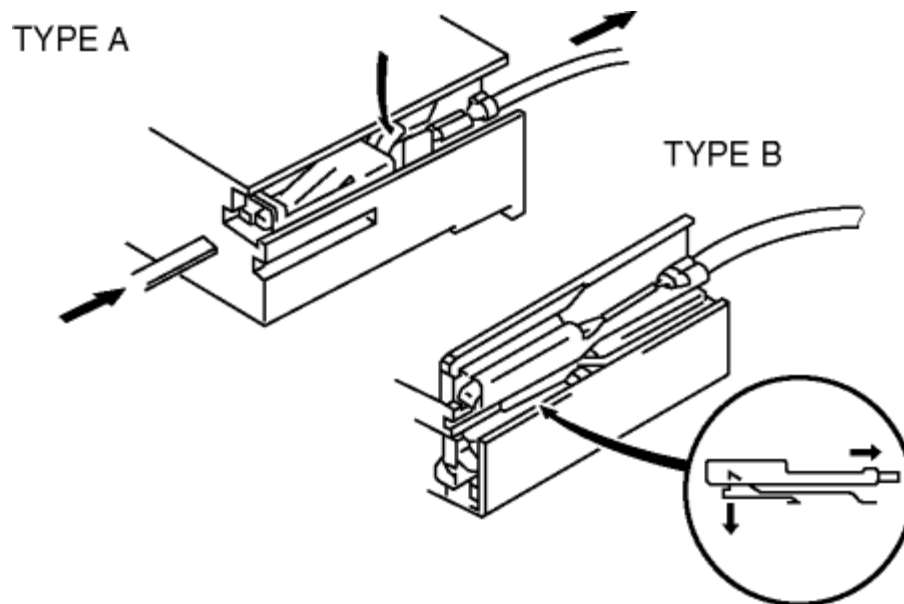
##### Inspection

- Pull lightly on individual wires to verify that they are secured in the terminal.



### Replacement

- Use the appropriate tools to remove a terminal as shown. When installing a terminal, be sure to insert it until it locks securely.



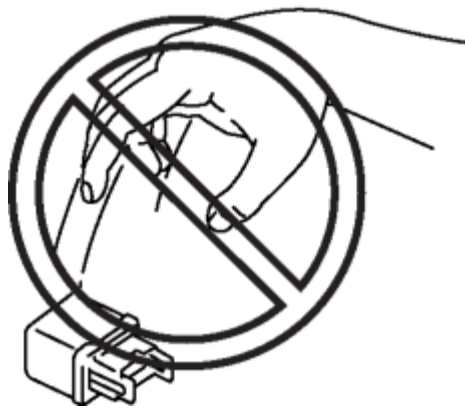
- Insert a thin piece of metal from the terminal side of the connector and with the terminal locking tab pressed down, pull the terminal out from the connector.

### Sensors, Switches, and Relays

- Handle sensors, switches, and relays carefully. Do not drop them or strike them against other objects.



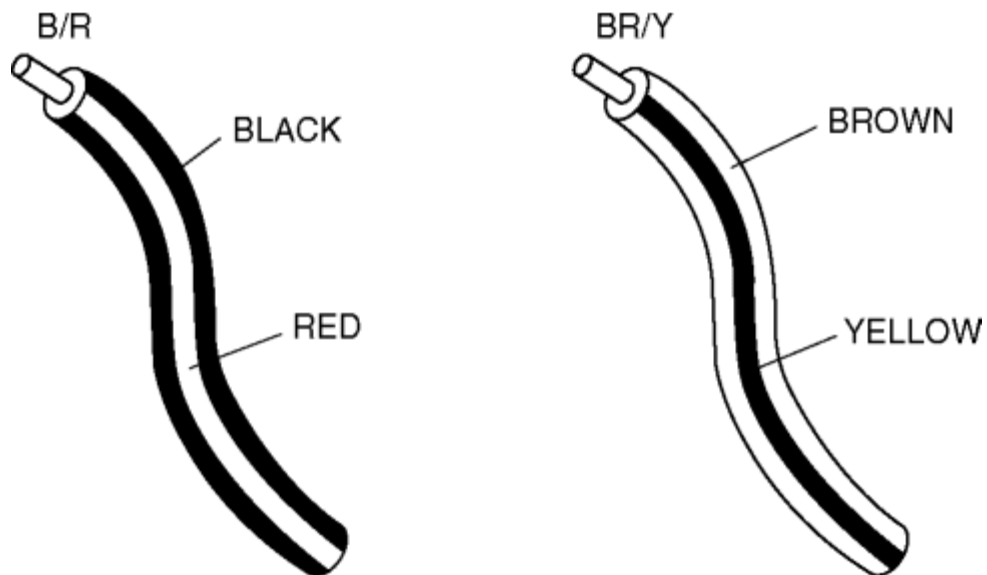
NO GOOD



## Wiring Harness

### Wiring color codes

- Two color wires are indicated by a two color code symbol.



- The first letter indicates the base color of the wire and the second the color of the stripe.

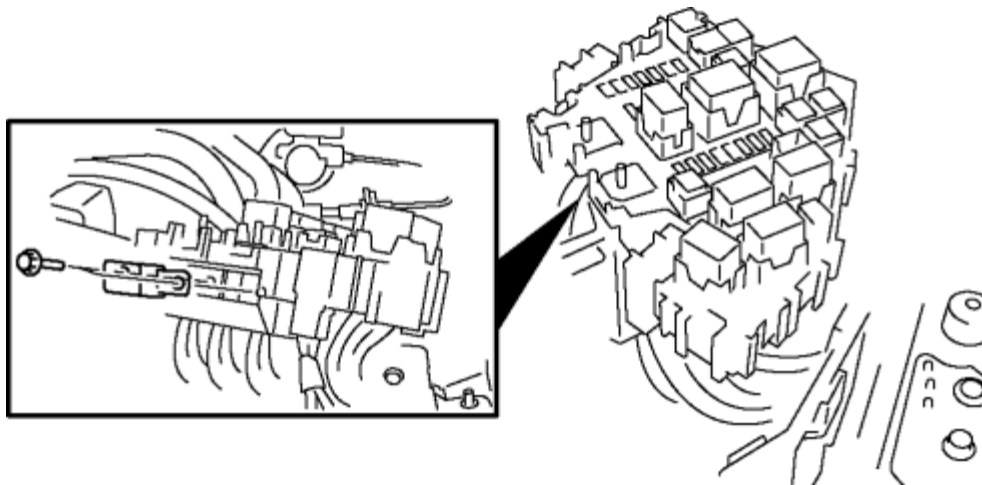
CODE	COLOR	CODE	COLOR
B	Black	O	Orange
BR	Brown	P	Pink
G	Green	R	Red

GY	Gray	V	Violet
L	Blue	W	White
LB	Light Blue	Y	Yellow
LG	Light Green		

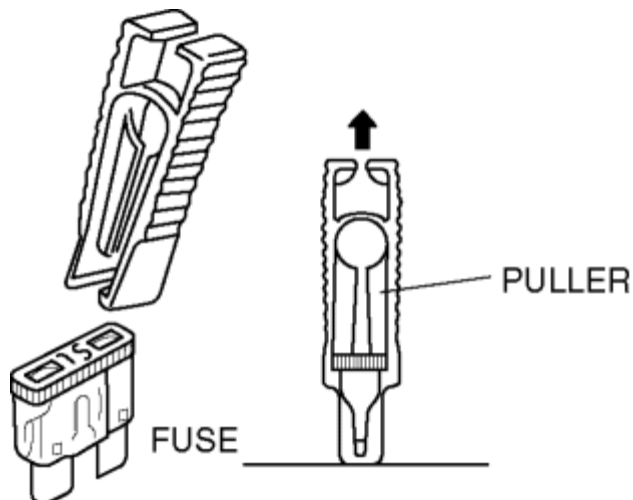
## Fuse

### Replacement

- When replacing a fuse, be sure to replace it with one of the same capacity. If a fuse fails again, the circuit probably has a short and the wiring should be inspected.



- Be sure the negative battery terminal is disconnected before replacing a main fuse.
- When replacing a pullout fuse, use the fuse puller.

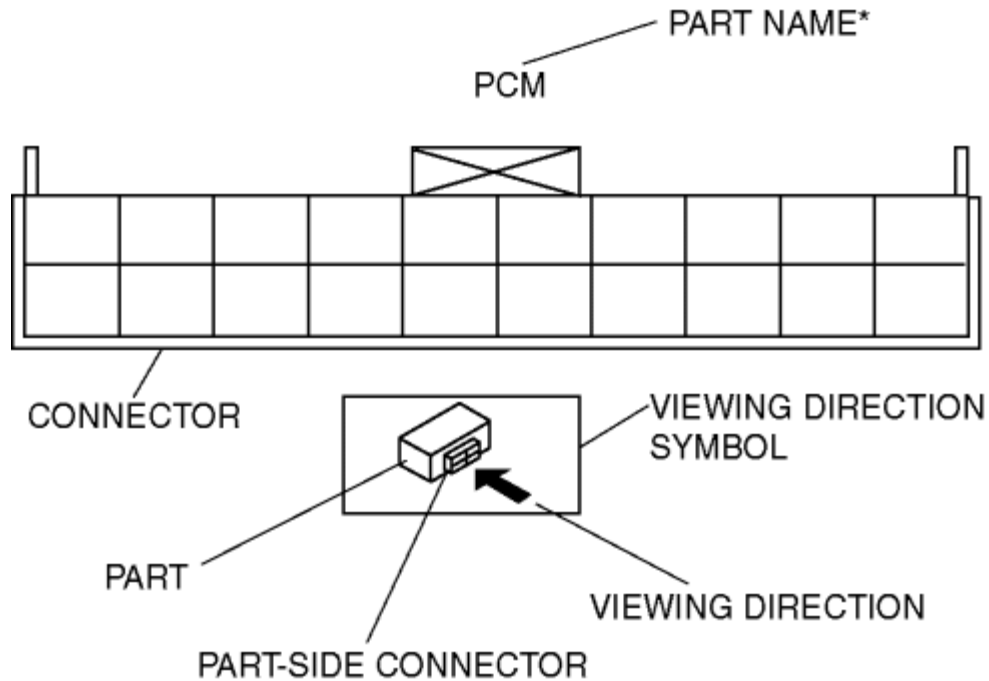


## Direction of View for Connector

- The viewing direction of connectors is indicated with a symbol.
- The figures showing the viewing direction are the same as those used in Wiring Diagrams.
- The viewing directions are shown in the following three ways:

### Part-side connector

The viewing direction of part-side connectors is from the terminal side.

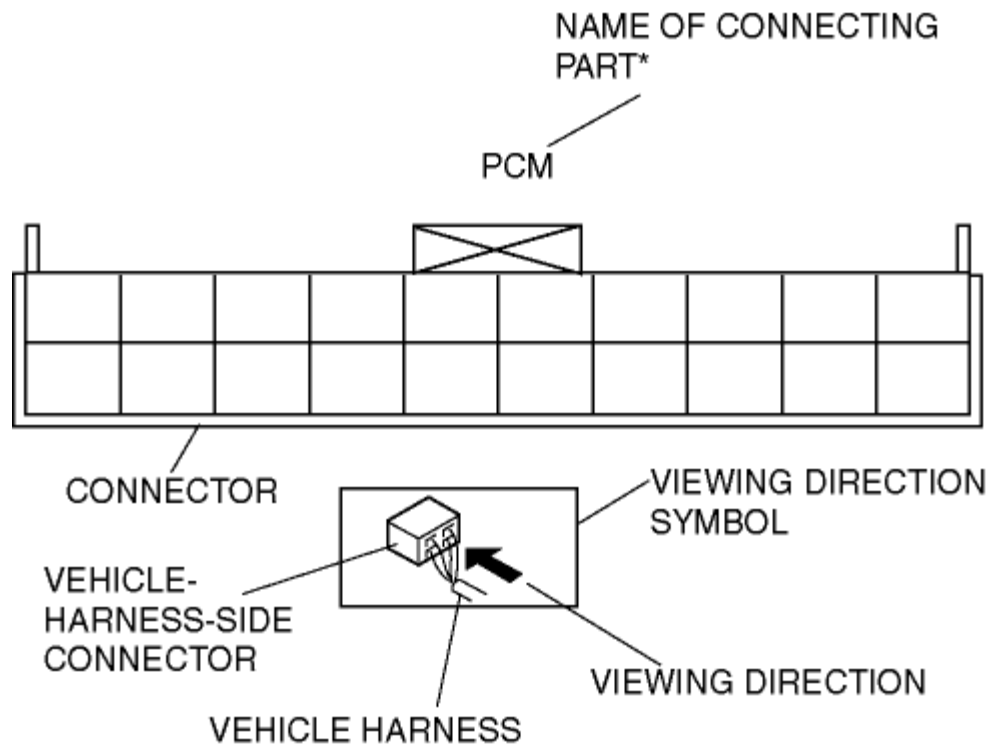


\*

Part names are shown only when there are multiple connector drawings.

### Vehicle harness-side connector

The viewing direction of vehicle harness-side connectors is from the harness side.

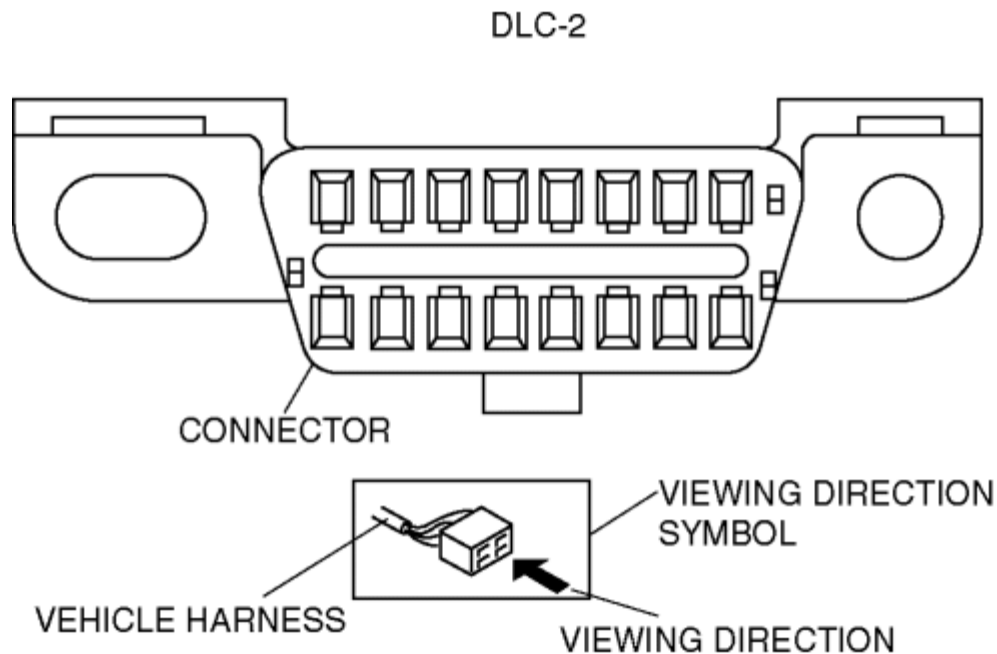


\*

Part names are shown only when there are multiple connector drawings.

#### Other

When it is necessary to show the terminal side of vehicle harness-side connectors, such as the following connectors, the viewing direction is from the terminal side.



- Main fuse block and the main fuse block relays
- Data link connector

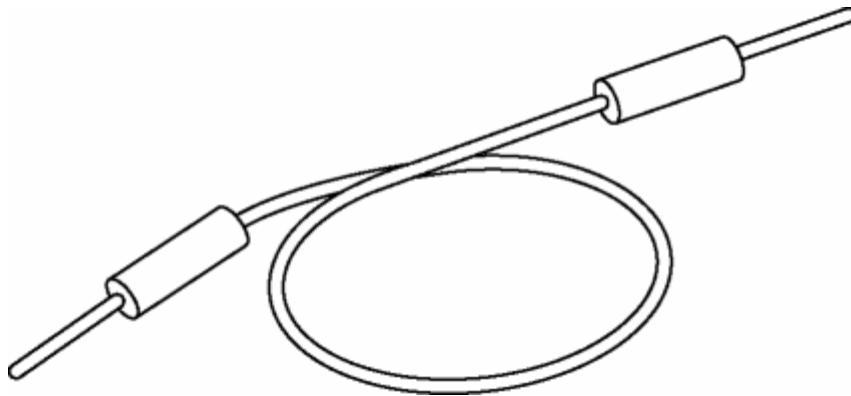
- Check connector
- Relay box

## Electrical Troubleshooting Tools

### Jumper wire

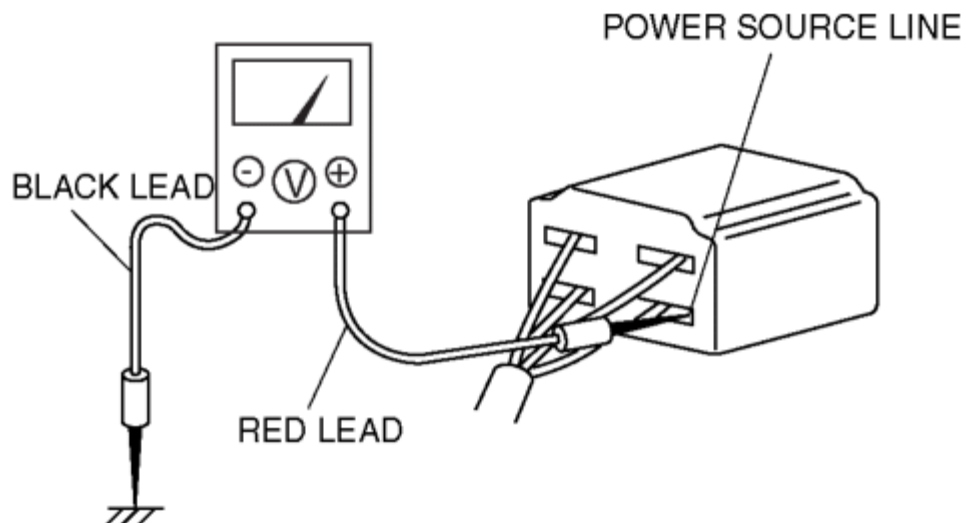
#### CAUTION:

- Do not connect a jumper wire from the power source line to a body ground. This may cause burning or other damage to wiring harnesses or electronic components.
- A jumper wire is used to create a temporary circuit. Connect the jumper wire between the terminals of a circuit to bypass a switch.



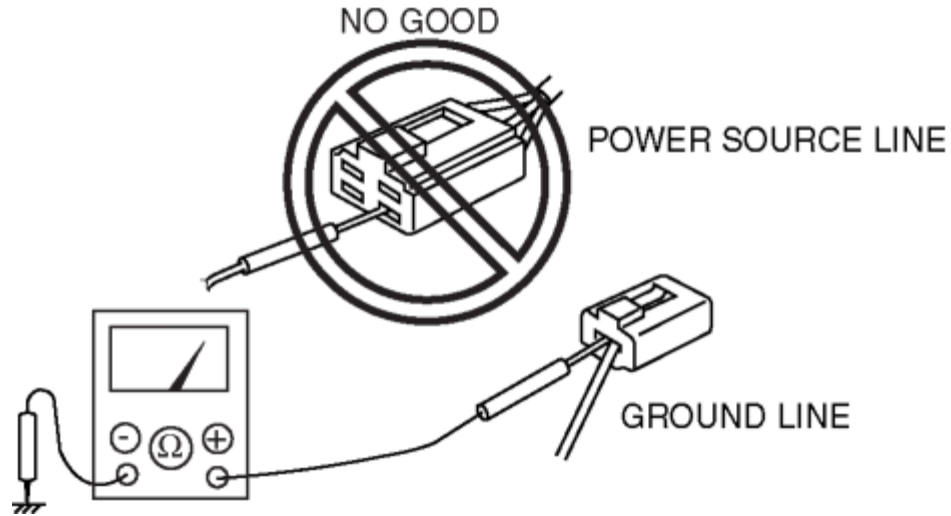
### Voltmeter

- The DC voltmeter is used to measure circuit voltage. A voltmeter with a range of **15 V or more** is used by connecting the positive (+) probe (red lead wire) to the point where voltage will be measured and the negative (-) probe (black lead wire) to a body ground.



**CAUTION:**

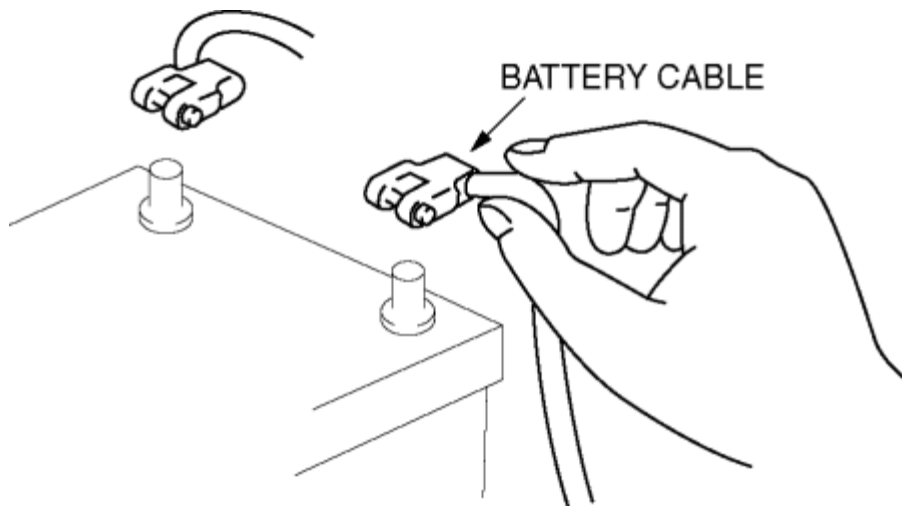
- Do not connect the ohmmeter to any circuit where voltage is applied. This will damage the ohmmeter.
- The ohmmeter is used to measure the resistance between two points in a circuit and to inspect for continuity and short circuits.



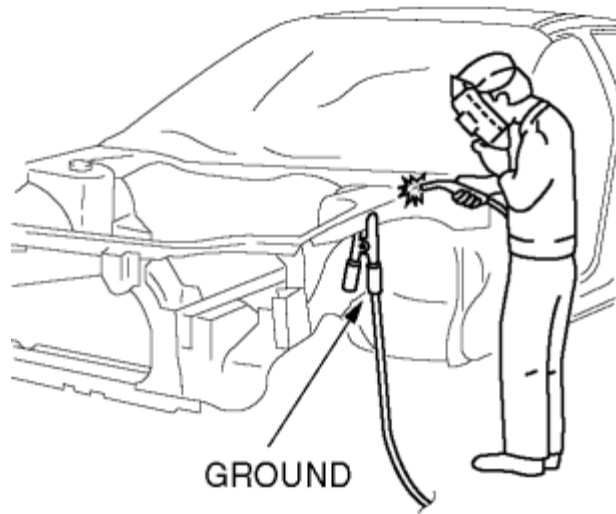
**Precautions Before Welding**

A vehicle has various electrical parts. To protect the parts from excessive current generated when welding, be sure to perform the following procedure.

1. Turn the ignition switch to the LOCK position.
2. Disconnect the battery cables.



3. Securely connect the welding machine ground near the welding area.



4. Cover the peripheral parts of the welding area to protect them from weld spatter.

[< Previous](#)   [Next >](#)

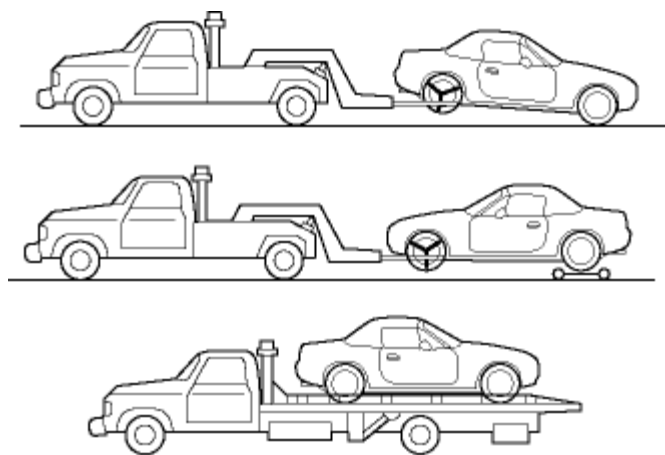
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## 2008 - MX-5 - General Information

### TOWING

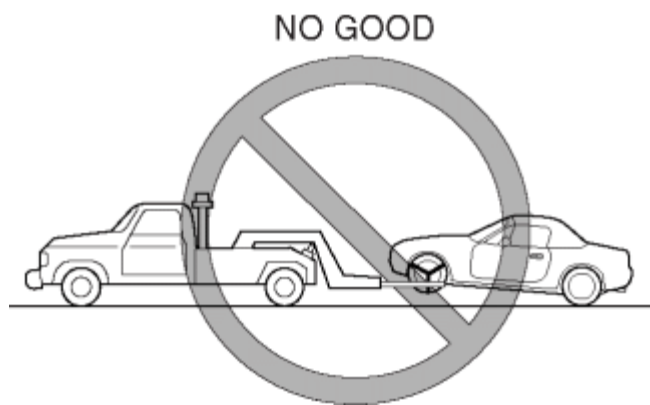
- Proper lifting and towing are necessary to prevent damage to the vehicle. State and local laws must be followed.



- A towed vehicle usually should have its rear wheels off the ground. If excessive damage or other conditions prevent this, use wheel dollies.

### CAUTION:

- Do not tow the vehicle pointed forward with driving wheels on the ground. This may cause internal damage to the transmission.

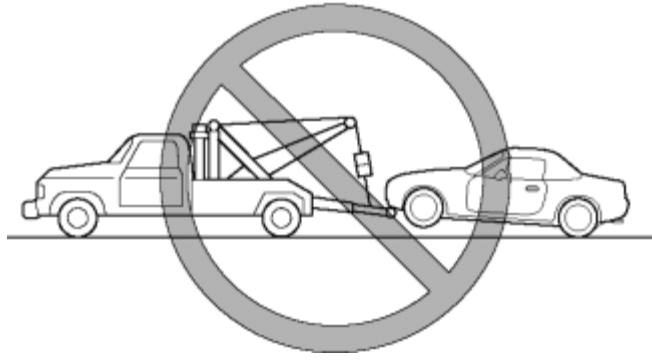


### CAUTION:

- Do not tow with sling type equipment. This could damage your vehicle. Use wheel lift or flatbed equipment.



NO GOOD



## Tiedown Hooks

### CAUTION:

- Do not use the tiedown hooks under the front and rear for towing. They are designed ONLY for tying down the vehicle when it's being transported. Using them for towing will damage the bumper.

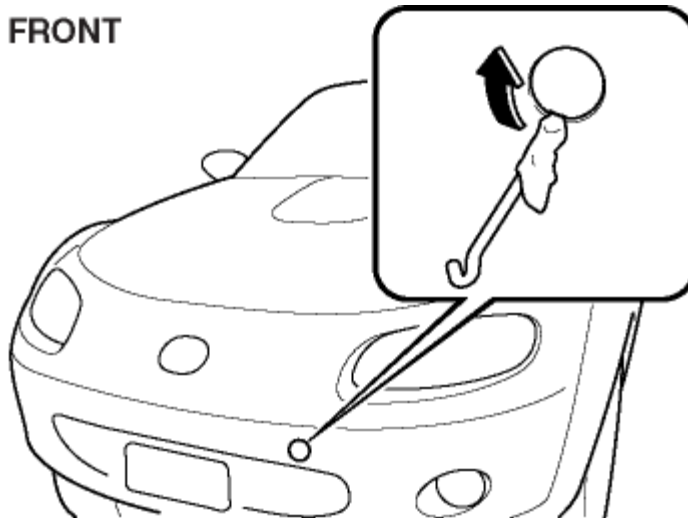
1. Remove the tiedown eyelet from trunk.

2. Wrap a screwdriver or similar tool with a soft cloth to prevent damage to the painted bumper and open the cap located on the front bumper.

### CAUTION:

- The cap cannot be completely removed. Do not use excessive force as it may damage the cap or scratch the painted bumper surface.

FRONT

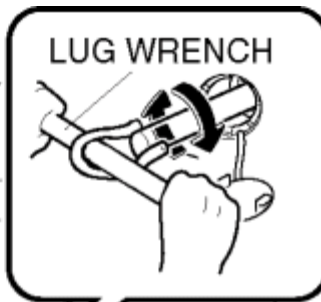
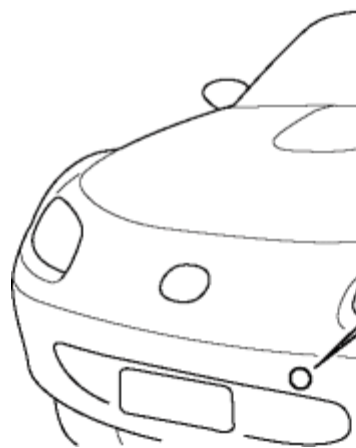


**REAR**

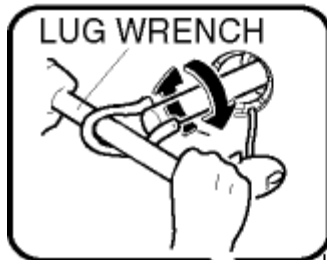


3. Securely install the tiedown eyelet using the lug wrench.

**FRONT**

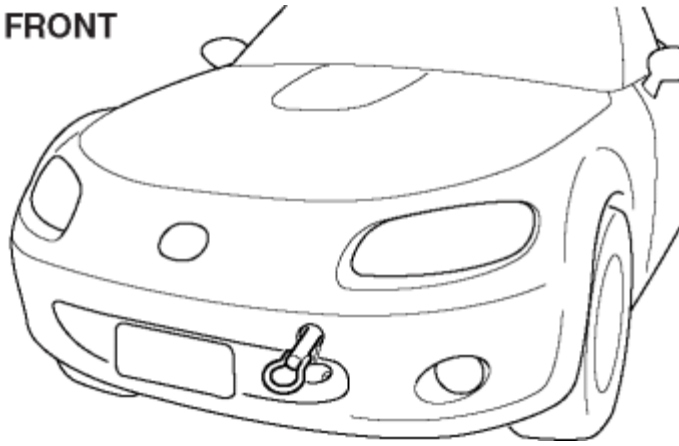


**REAR**

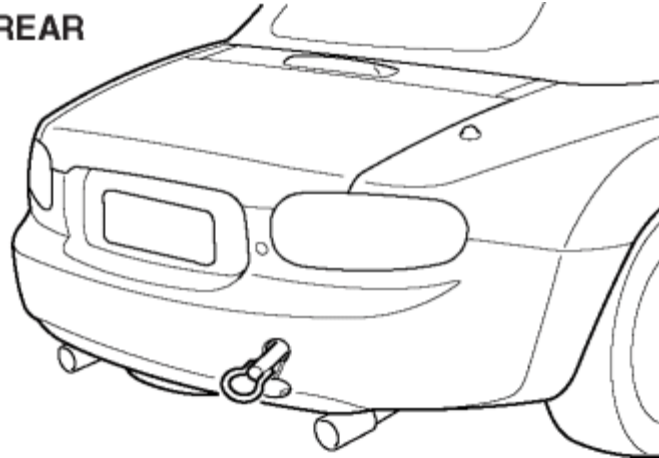


4. Hook the tying rope to the tiedown eyelet.

**FRONT**



**REAR**



**CAUTION:**

- If the tiedown eyelet is not securely tightened, it may loosen or disengage from the bumper when tying down the vehicle. Make sure that the tiedown eyelet is securely tightened to the bumper.

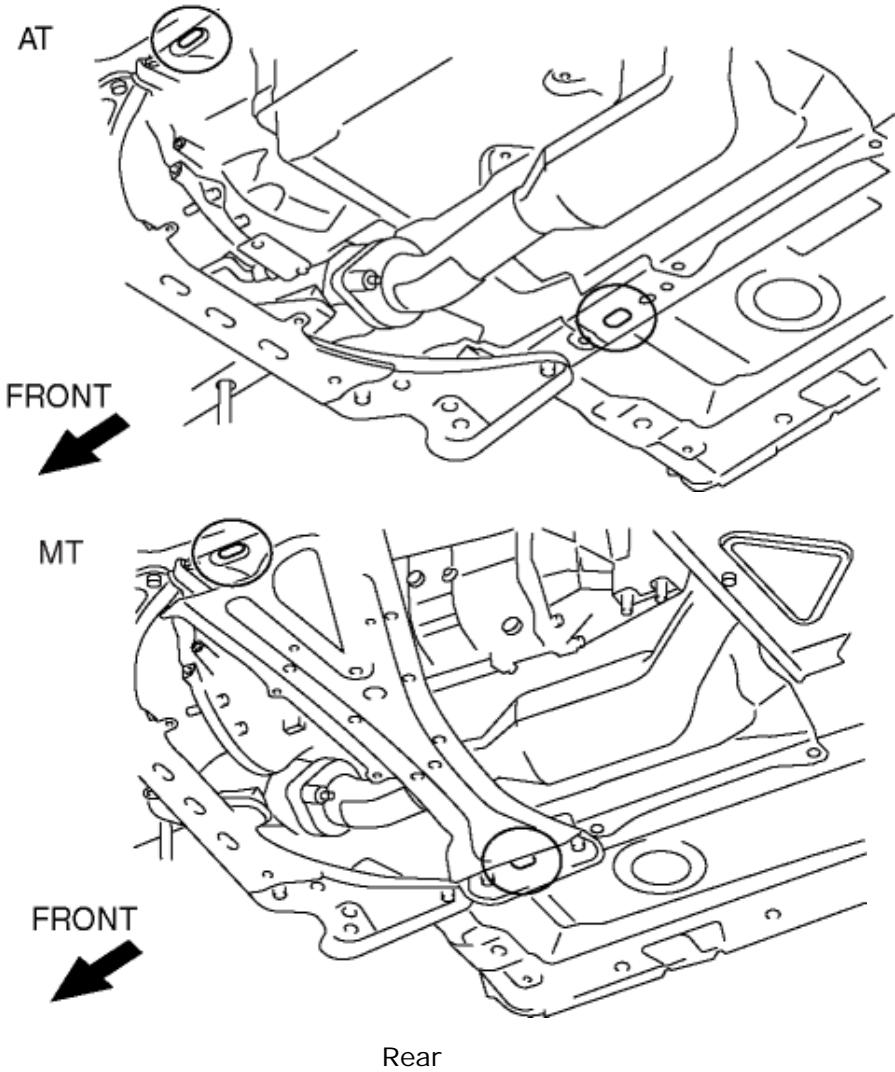
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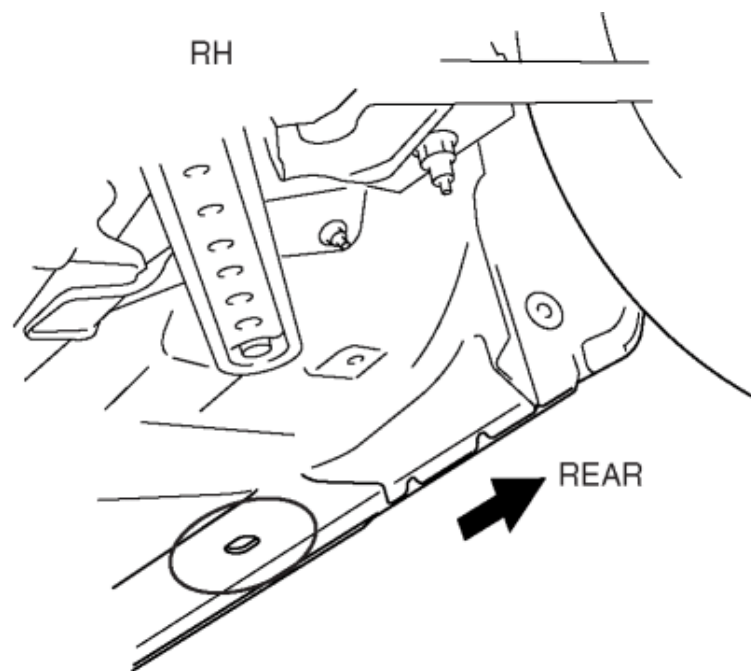
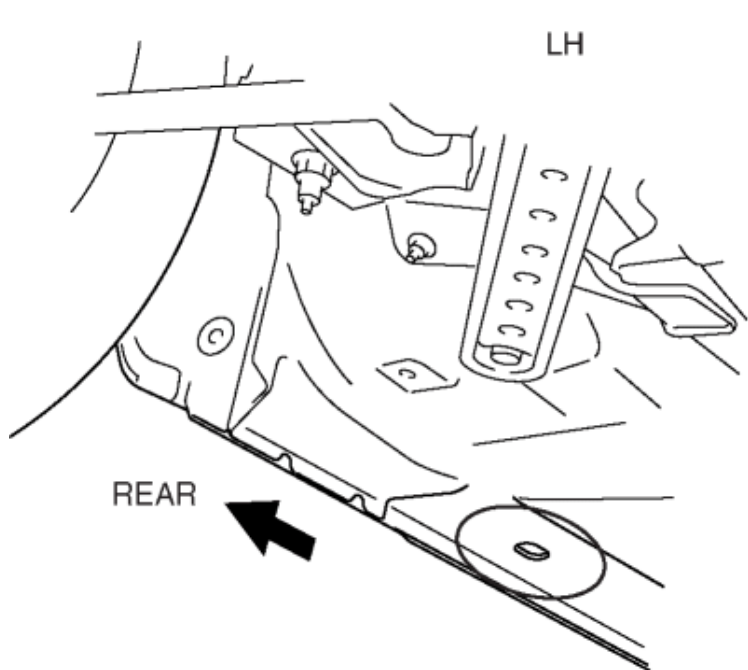
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TIEDOWN HOOK

Front





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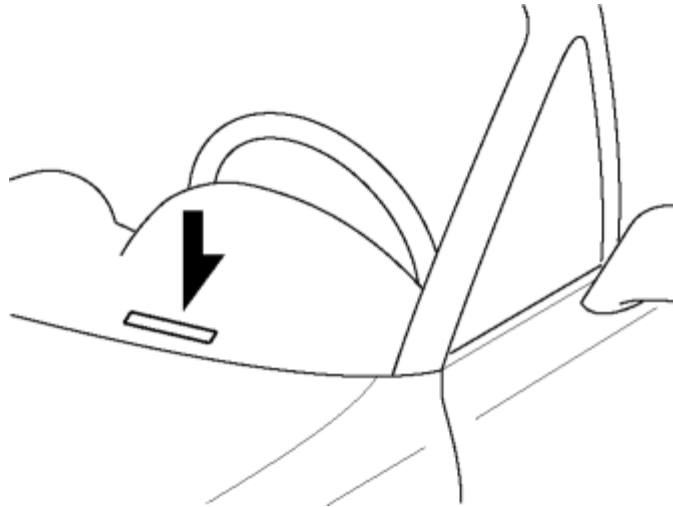
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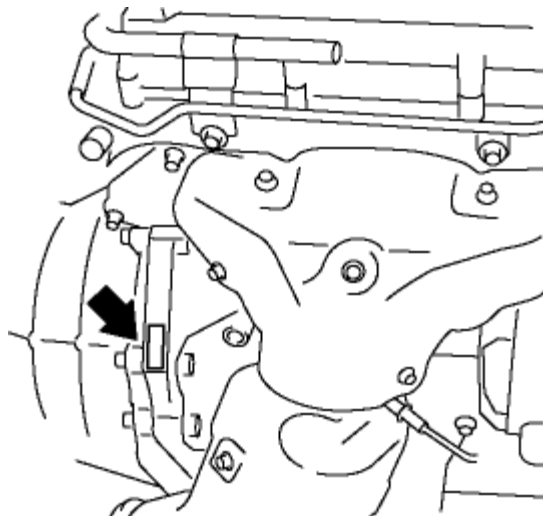
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### IDENTIFICATION NUMBER LOCATIONS

#### Vehicle Identification Number (VIN)



#### Engine Identification Number



## 2008 - MX-5 - General Information

### SAE STANDARDS

- In accordance with new regulations, SAE (Society of Automotive Engineers) standard names and abbreviations are now used in this manual. The table below lists the names and abbreviations that have been used in Mazda manuals up to now and their SAE equivalents.

SAE Standard		Remark	SAE Standard		Remark
Abbreviation	Name		Abbreviation	Name	
AP	Accelerator Pedal		MAP	Manifold Absolute Pressure	
APP	Accelerator Pedal Position		MAF sensor	Mass Air Flow Sensor	
ACL	Air Cleaner		MFL	Multiport Fuel Injection	
A/C	Air Conditioning		OBD	On board Diagnostic System	
BARO	Barometric Pressure		OL	Open Loop	
B+	Battery Positive Voltage		OC	Oxidation Catalytic Converter	
CMP sensor	Camshaft Position Sensor		O2S	Oxygen sensor	
CAC	Charge Air Cooler		PNP	Park/Neutral Position	
CLS	Closed Loop System		PSP	Power Steering Pressure	
CTP	Closed Throttle Position		PCM	Powertrain Control Module	#3
CPP	Clutch Pedal Position		PAIR	Pulsed Secondary Air Injection	Pulsed injection
CIS	Continuous Fuel Injection System				
CKP sensor	Crankshaft Position Sensor				

DLC	Data Link Connector		AIR	Secondary Air Injection	Injection with air pump
DTM	Diagnostic Test Mode	#1			
DTC	Diagnostic Test Code(s)		SAPV	Secondary Air Pulse Valve	
DI	Distributor Ignition		SFI	Sequential Multiport Fuel Injection	
DLI	Distributorless Ignition				
EI	Electronic Ignition	#2	3GR	Third Gear	
ECT	Engine Coolant Temperature		TWC	Three Way Catalytic Converter	
EM	Engine Modification		TB	Throttle Body	
EVAP	Evaporative Emission		TP sensor	Throttle Position Sensor	
EGR	Exhaust Gas Recirculation		TCC	Torque Converter Clutch	
FC	Fan Control		TCM	Transmission (Transaxle) Control Module	
FF	Flexible Fuel				
4GR	Fourth Gear		TR	Transmission (Transaxle) Range	
GEN	Generator		TC	Turbocharger	
GND	Ground		VSS	Vehicle Speed Sensor	
HO2S	Heated Oxygen Sensor	With heater	VR	Voltage Regulator	
			VAF sensor	Volume Air Flow Sensor	
IAC	Idle Air Control		WU-TWC	Warm Up Three Way Catalytic Converter	#4
IAT	Intake Air Temperature				
KS	Knock Sensor		WOP	Wide Open Throttle	
MIL	Malfunction Indicator Lamp				



- 
- #1: Diagnostic trouble codes depend on the diagnostic test mode.
  - #2: Controlled by the PCM
  - #3: Device that controls engine and powertrain
  - #4: Directly connected to exhaust manifold

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## 2008 - MX-5 - General Information

### ABBREVIATIONS

ABS	Antilock Brake System
ACC	Accessories
ALR	Automatic Locking Retractor
AT	Automatic Transmission
ATF	Automatic Transmission Fluid
BTDC	Before Top Dead Center
CAN	Controller Area Network
CCM	Comprehensive Component Monitor
CM	Control Module
DC	Drive Cycle
DRL	Daytime Running Light
DSC	Dynamic Stability Control
EBD	Electronic Brakeforce Distribution
E/L	Electric Load
ELR	Emergency Locking Retractor
EX	Exhaust
FFD	Freeze Frame Data

HI	High
HU	Hydraulic Unit
IDS	Integrated Diagnostic Software
IG	Ignition
IN	Intake
INT	Intermittent
KOEO	Key On Engine Off
KOER	Key On Engine Running
LED	Light Emitting Diode
LF	Left Front
LH	Left Hand
LO	Low
LR	Left Rear
LSD	Limited Slip Differential
M	Motor
MAX	Maximum
MIN	Minimum
MT	Manual Transmission
OCV	Oil Control Valve
PAD	Passenger Air Bag Deactivation
PC	Pending Code
PCV	Positive Crankcase Ventilation

PDS	Portable Diagnostic Software
PID	Parameter Identification
POWER MOS FET	Power Metal Oxide Semiconductor Field Effect Transistor
P/S	Power Steering
PTC	Positive Temperature Coefficient
P/W	Power Window
RAM	Random Access Memory
RF	Right Front
RH	Right Hand
ROM	Read Only Memory
RR	Right Rear
SAS	Sophisticated Air Bag Sensor
SST	Special Service Tool
SW	Switch
TCS	Traction Control System
TDC	Top Dead Center
TFT	Transmission Fluid Temperature
TNS	Tail Number Side Lights
TPMS	Tire Pressure Monitoring System
W/M	Workshop Manual
1GR	First Gear
2GR	Second Gear

3GR	Third Gear
4GR	Fourth Gear
5GR	Fifth Gear
6GR	Sixth Gear

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## 2008 - MX-5 - General Information

### PRE-DELIVERY INSPECTION

#### Pre-Delivery Inspection Table

##### Exterior

**INSPECT** and **ADJUST**, if necessary, the following items to specification:

- ☐ Glass, exterior bright metal and paint for damage
- ☐ Convertible top and detachable hardtop (if equipped) for damage
- ☐ Power retractable hardtop for damage
- ☐ Wheel lug nuts
- ☐ All weatherstrips for damage or detachment
- ☐ Operation of hood release and lock
- ☐ Operation of trunk lid and fuel-filler lid
- ☐ Door operation and alignment
- ☐ Headlight aiming

##### TRUNK ROOM

- ☐ Check spare tire and air pressure
- ☐ Inspect operation of trunk lid internal release

**INSTALL** the following items:

- ☐ Wheel caps (if equipped)
- ☐ Mast antenna (if equipped)

##### Under hood—engine off

**INSPECT** and **ADJUST**, if necessary, the following items to specification:

- ☐ Fuel, engine coolant, and hydraulic lines, fittings, connections, and components for leaks
- ☐ Engine oil level
- ☐ Power steering fluid level
- ☐ Brake and clutch master cylinder fluid level
- ☐ Windshield washer reservoir fluid level
- ☐ Automatic transmission fluid level
- ☐ Radiator coolant level and specific gravity
- ☐ Tightness of battery terminals

##### Interior

**INSPECT** the operations of the following items:

- ☐ Seat controls (slide and recline)
- ☐ Seat belts and warning system
- ☐ Air bag system using warning light
- ☐ Cruise control system (if equipped)

- ☐ Ignition switch and steering lock
- ☐ Starter interlock
- ☐ Power door lock
- ☐ Door locks, including childproof door locks
- ☐ All lights including warning, and indicator lights
- ☐ Horn, wipers, and washers
- ☐ Wiper blades performance
- ☐ Audio system
- ☐ Power windows (if equipped)
- ☐ Heater, defroster, and air conditioner at various mode selections (if equipped)

**INSPECT** the following items:

- ☐ Presence of spare fuse
- ☐ Upholstery and interior finish

**INSPECT** and **ADJUST**, if necessary, the following items:

- ☐ Pedal height and free play of brake and clutch pedal
- ☐ Parking brake

#### **Under hood—engine running at operating temperature**

**INSPECT** the following items:

- ☐ Automatic transmission fluid level

#### **On hoist**

**INSPECT** the following items:

- ☐ Underside fuel, coolant and hydraulic lines, fittings, connections, and components for leaks
- ☐ Tires for cuts or bruises
- ☐ Steering linkage, suspension, exhaust system, and all underside hardware for looseness or damage
- ☐ Manual transmission oil level
- ☐ Differential oil level

#### **Road test**

**INSPECT** the following items:

- ☐ Brake operation
- ☐ Clutch operation
- ☐ Steering control
- ☐ Emergency locking retractors and automatic locking retractors
- ☐ Cruise control system (if equipped)
- ☐ Operation of meters and gauges, squeaks, rattles, and unusual noises

#### **After road test**

**INSPECT** for necessary owner information materials, tools, and spare tire in vehicle  
The following items must be completed just before delivery to your customer.

- ☐ Load test battery and charge if necessary (Load test result: Volts)
- ☐ Adjust tire pressure to specification
- ☐ Clean outside of vehicle
- ☐ Install fuses for accessories
- ☐ Remove seat and cabin carpet protective covers
- ☐ Vacuum inside of vehicle
- ☐ Inspect installation of option parts with invoice





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## 2008 - MX-5 - General Information

## SCHEDULED MAINTENANCE

### Scheduled Maintenance Table (for U.S.A.)

### Schedule 1 (Normal Driving Conditions) U.S.A.

- The vehicle is mainly operated where none of the “unique driving conditions” apply.

Maintenance Interval	Number of months or kilometers (miles), whichever comes first								
	Months	6	12	18	24	30	36	42	48
	×1000 km	12	24	36	48	60	72	84	96
	×1000 miles	7.5	15	22.5	30	37.5	45	52.5	60
<b>ENGINE</b>									
Drive belts (tension)					I				
Engine valve clearance	Audible inspect every 120,000 km (75,000 miles), if noisy, adjust								
Engine oil	R	R	R	R	R	R	R	R	R
Engine oil filter	R	R	R	R	R	R	R	R	R
<b>COOLING SYSTEM</b>									
Engine coolant	FL22 <sup>*1</sup>	Replace at first 192,000 km (120,000 miles) or 10 years; after that, 96,000 km (60,000 miles) or 5 years							
	Others	Replace at first 96,000 km (60,000 miles) or 4 years;							

		after that, every 2 years						
FUEL SYSTEM								
Air cleaner element		C		C	R		C	
Fuel lines and hoses *2				I				I
Hoses and tubes for emission *2								I
IGNITION SYSTEM								
Spark plugs	Replace every 120,000 km (75,000 miles)							
CHASSIS and BODY								
Brake lines, hoses and connections				I				I
Disc brakes		I		I		I		I
Tire (Rotation)	Rotate every 12,000 km (7,500 miles)							
Flat tire repair kit (if installed) *3	Inspect annually							
Steering operation and linkages				I				I
Front and rear suspension, ball joints and wheel bearing axial play				I				I
Manual transmission oil								R
Rear differential oil								R
Drive shaft dust boots				I				I
Bolts and nuts on chassis and bodys				T				T
Exhaust system and heat shields	Inspect every 72,000 km (45,000 miles) or 5 years							
All locks and hinges	L	L	L	L	L	L	L	L

Chart symbols

- **I**: Inspect: Inspect and clean, repair, adjust, or replace if necessary.

- **R:** Replace
- **L:** Lubricate
- **C:** Clean
- **T:** Tighten

### Remarks

- After the prescribed period, continue to follow the described maintenance at the recommended intervals.
- Refer below for a description of items marked\* in the maintenance chart.
  - \*1: Use FL22 type coolant in vehicles with the inscription “FL22” on the radiator cap itself or the surrounding area. Use FL22 when replacing the coolant.
  - \*2: According to state/provincial and federal regulations, failure to perform maintenance on these items will not void your emissions warranties. However, Mazda recommends that all maintenance services be performed at the recommended time or mileage/kilometer period to ensure long-term reliability.
  - \*3: Check the tire repair fluid expiration date every year when performing the periodic maintenance. Replace the tire repair fluid bottle with new one before the expiration date.

## Schedule 2 CANADA, Puerto Rico, and (Unique Driving Conditions) U.S.A.

- Repeated short-distance driving.
- Driving in dusty conditions.
- Driving with extended use of brakes.
- Driving in areas where salt or other corrosive materials are used.
- Driving on rough or muddy roads.
- Extended periods of idling or low-speed operation.
- Driving for long periods in cold temperatures or extremely humid climates.
- Driving in extremely hot conditions
- Driving in mountainous conditions continually

[illegible]

	×1000 miles	5	10	15	20	25	30	35	40	45	50	55	60	
ENGINE														
Drive belts (tension)								I						
Engine valve clearance		Audible inspect every 120,000 km (75,000 miles), if noisy, adjust												
Engine oil	Puerto Rico	Replace every 5,000 km (3,000 miles) or 3 months												
	Others	R	R	R	R	R	R	R	R	R	R	R	R	
Engine oil filter		R	R	R	R	R	R	R	R	R	R	R	R	
COOLING SYSTEM														
Engine coolant	FL22 <sup>*1</sup>	Replace at first 192,000 km (120,000 miles) or 10 years; after that, 96,000 km (60,000 miles) or 5 years												
	Others	Replace at first 96,000 km (60,000 miles) or 4 years; after that, every 2 years												
Engine coolant level		I	I	I	I	I	I	I	I	I	I	I	I	
FUEL SYSTEM														
Air cleaner element	Puerto Rico			C			R			C			R	
	Others			C			C	R			C			
Fuel lines and hoses <sup>*2</sup>							I						I	
Hoses and tubes for emission <sup>*2</sup>													I	
IGNITION SYSTEM														
Spark plugs	U.S.A.	Replace every 96,000 km (60,000 miles)												
	Others	Replace every 120,000 km (75,000 miles)												
ELECTRICAL SYSTEM														

Function of all lights	I	I	I	I	I	I	I	I	I	I	I	I
<b>CHASSIS and BODY</b>												
Brake lines, hoses and connections						I						I
Brake fluid level	I	I	I	I	I	I	I	I	I	I	I	I
Disc brakes			I			I			I			I
Tire (Rotation)	Rotate every 8,000 km (5,000 miles)											
Tire inflation pressure and tire wear	I	I	I	I	I	I	I	I	I	I	I	I
Flat tire repair kit (if installed) <sup>*3</sup>	Inspect annually											
Steering operation and linkages						I						I
Power steering fluid level	I	I	I	I	I	I	I	I	I	I	I	I
Front and rear suspension, ball joint and wheel bearing axial plays						I						I
Manual transmission oil						R						R
Rear differential oil						R						R
Drive shaft dust boots						I						I
Bolts and nuts on chassis and body						T						T
Exhaust system and heat shields	Inspect every 72,000 km (45,000 miles) or 5 years											
All locks and hinges	L	L	L	L	L	L	L	L	L	L	L	L
Washer fluid level	I	I	I	I	I	I	I	I	I	I	I	I

### Chart symbols

- **I**: Inspect: Inspect and clean, repair, adjust, or replace if necessary.
- **R**: Replace
- **L**: Lubricate

C: Clean

- T: Tighten

### Remarks

- After the prescribed period, continue to follow the described maintenance at the recommended intervals.
- Refer below for a description of items marked\* in the maintenance chart.
  - \*1: Use FL22 type coolant in vehicles with the inscription "FL22" on the radiator cap itself or the surrounding area. Use FL22 when replacing the coolant.
  - \*2: According to state/provincial and federal regulations, failure to perform maintenance on these items will not void your emissions warranties. However, Mazda recommends that all maintenance services be performed at the recommended time or mileage/kilometer period to ensure long-term reliability.
  - \*3: Check the tire repair fluid expiration date every year when performing the periodic maintenance. Replace the tire repair fluid bottle with new one before the expiration date.

### Scheduled Maintenance Table (Except for U.S.A., CANADA, Puerto Rico and Mexico)

Maintenance Interval	Number of months or kilometers (miles), whichever comes first																
	Months	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96
	×1000 km	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160
	×1000 miles	6.25	12.5	18.75	25	31.25	37.5	43.75	50	56.25	62.5	68.75	75	81.25	87.5	93.75	100
<b>ENGINE</b>																	
Engine valve clearance		Audible inspect every 120,000 km (75,000 miles), if noisy, adjust															
Engine oil <sup>*1</sup>		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Engine oil filter <sup>*1</sup>		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Drive belts <sup>*2</sup>		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
<b>COOLING SYSTEM</b>																	

Cooling system			I		I		I		I		I		I		I		I
Engine coolant	FL22 type *3										R						
	Others	Replace every 2 years															

## FUEL SYSTEM

Air cleaner element * <sup>4</sup>	C	C	R	C	C	R	C	C
Fuel filter	Replace every 60,000 km (37,500 miles)							
Fuel lines and hoses	I	I	I	I	I	I	I	I

## IGNITION SYSTEM

Spark plugs	Replace every 100,000 km (62,500 miles)
-------------	---

## EMISSION CONTROL SYSTEM

[illegible]

## ELECTRICAL SYSTEM

[illegible]

## CHASSIS and BODY

[illegible]

Steering operation and linkages		I		I		I		I		I		I		I		I
Manual transmission oil										R						
Rear differential oil								R								R
Front and rear suspension, ball joints and wheel bearing axial play		I		I		I		I		I		I		I		I
Drive shaft dust boots				I				I				I				I
Exhaust system and heat shields	Inspect every 80,000 km (50,000 miles)															
Bolts and nuts on chassis and body		T		T		T		T		T		T		T		T
Body condition (for rust, corrosion and perforation)	Inspect annually															
Tire rotation	Rotate every 10,000 km (6,250 miles)															
Tires (with inflation pressure adjustment)	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Flat tire repair kit (if installed) *6	Inspect annually															

Remarks

- Emission control and related systems
  - The ignition and fuel systems are highly important to the emission control system and to efficient engine operation. All inspections and adjustments must be made by an Authorized Mazda Dealer.
  - After the prescribed period, continue to follow the described maintenance at the recommended intervals.
  - Refer below for a description of items marked\* in the maintenance chart.
    - \*1: If the vehicle is operated primarily under any of the following conditions, replace the engine oil and oil filter more often than the recommended intervals.



- ### Scheduled Maintenance Table (for Mexico)

- The vehicle is mainly operated where none of the “unique driving conditions” apply.

[illegible]

Engine oil filter		R	R	R	R	R	R	R	R	R	R	R	R
COOLING SYSTEM													
Cooling system					I				I				I
Engine coolant	FL22 type <sup>*1</sup>	Replace at first 190,000 km or 10 years; after that, every 60,000 km or 3 years											
	Others				R				R				R
FUEL SYSTEM													
Air cleaner element			R		R		R		R		R		R
Fuel lines and hoses					I <sup>*2</sup>				I <sup>*2</sup>				I
Hoses and tubes for emission					I <sup>*2</sup>				I <sup>*2</sup>				I
Fuel filter					R				R				R
IGNITION SYSTEM													
Spark plugs		Replace every 60,000 km											
CHASSIS and BODY													
Brake lines, hoses and connections			I		I		I		I		I		I
Brake fluid level		I	I	I		I	I	I		I	I	I	
Brake fluid					R				R				R
Disc brakes		I	I	I	I	I	I	I	I	I	I	I	I
Tire (Rotation)		Rotate every 10,000 km											
Tire inflation pressure and tire wear		I	I	I	I	I	I	I	I	I	I	I	I
Flat tire repair kit (if installed) <sup>*3</sup>		Inspect annually											
Steering operation and linkages		I	I	I	I	I	I	I	I	I	I	I	I

Power steering fluid level	I	I	I	I	I	I	I	I	I	I	I	I	I
Front and rear suspension, ball joints and wheel bearing axial play		I		I		I		I		I			I
Manual transmission oil								R					
Rear differential oil				R				R					R
Drive shaft dust boots		I		I		I		I		I			I
Exhaust system and heat shields		I		I		I		I		I			I
Bolts and nuts on chassis and body		T		T		T		T		T			T
All locks and hinges	L	L	L	L	L	L	L	L	L	L	L	L	L
Washer fluid level	I	I	I	I	I	I	I	I	I	I	I	I	I

### Chart symbols

- **I**: Inspect: Inspect and clean, repair, adjust, or replace if necessary.
- **R**: Replace
- **L**: Lubricate
- **C**: Clean
- **T**: Tighten

### Remarks

- After the prescribed period, continue to follow the described maintenance at the recommended intervals.
- Refer below for a description of items marked\* in the maintenance chart.
  - \*1: Use FL22 type coolant in vehicles with the inscription "FL22" on the radiator cap itself or the surrounding area. Use FL22 when replacing the coolant.
  - \*2: According to state/provincial and federal regulations, failure to perform maintenance on these items will not void your emissions warranties. However, Mazda recommends that all maintenance services be performed at the recommended time or kilometer period to ensure long-term reliability.
  - \*3: Check the tire repair fluid expiration date every year when performing the periodic maintenance. Replace the tire repair fluid bottle with new one before the expiration date.

Schedule 2 (Unique Driving Conditions) for Mexico

- Repeated short-distance driving.
- Driving in dusty conditions.
- Driving with extended use of brakes.
- Driving in areas where salt or other corrosive materials are used.
- Driving on rough or muddy roads.
- Extended periods of idling or low-speed operation.
- Driving for long periods in cold temperatures or extremely humid climates.
- Driving in extremely hot conditions
- Driving in mountainous conditions continually

Maintenance Interval	Number of months or kilometers, whichever comes first												
	Months	3	6	9	12	15	18	21	24	27	30	33	36
	×1000 km	5	10	15	20	25	30	35	40	45	50	55	60
ENGINE													
Drive belts (tension)									I				
Engine valve clearance	Audible inspect every 120,000 km, if noisy, adjust												
Engine oil	R	R	R	R	R	R	R	R	R	R	R	R	R
Engine oil filter	R	R	R	R	R	R	R	R	R	R	R	R	R
COOLING SYSTEM													
Cooling system									I				
Engine coolant	FL22 type <sup>*1</sup>	Replace at first 190,000 km or 10 years; after that, every 60,000 km or 3 years											
	Others								R				
Engine coolant level	I	I	I	I	I	I	I	I	I	I	I	I	I

FUEL SYSTEM												
Air cleaner element		C		R		C		R		C		R
Fuel lines and hoses								I*2				
Hoses and tubes for emission								I*2				
Fuel filter								R				
IGNITION SYSTEM												
Spark plugs	Replace every 60,000 km											
ELECTRICAL SYSTEM												
Function of all lights	I	I	I	I	I	I	I	I	I	I	I	I
CHASSIS and BODY												
Brake lines, hoses and connections				I				I				I
Brake fluid level		I		I		I				I		I
Brake fluid								R				
Disc brakes		I		I		I		I		I		I
Tire (Rotation)	Rotate every 10,000 km											
Tire inflation pressure and tire wear		I		I		I		I		I		I
Flat tire repair kit (if installed) *3	Inspect annually											
Steering operation and linkages		I		I		I		I		I		I
Power steering fluid level		I		I		I		I		I		I
Front and rear suspension, ball joints and wheel bearing axial play				I				I				I
Manual transmission oil								R				
Rear differential oil								R				

Drive shaft dust boots				I					I				I
Exhaust system and heat shields				I					I				I
Bolts and nuts on chassis and body				T					T				T
All locks and hinges		L		L		L			L		L		L
Washer fluid level		I		I		I			I		I		I

cont.

Maintenance Interval	Number of months or kilometers, whichever comes first													
	Months	39	42	45	48	51	54	57	60	63	66	69	72	
	×1000 km	65	70	75	80	85	90	95	100	105	110	115	120	

ENGINE

Drive belts (tension)				I									I
Engine valve clearance	Audible inspect every 120,000 km, if noisy, adjust												
Engine oil	R	R	R	R	R	R	R	R	R	R	R	R	R
Engine oil filter	R	R	R	R	R	R	R	R	R	R	R	R	R

COOLING SYSTEM

Cooling system				I									I
Engine coolant	FL22 type*1		Replace at first 190,000 km or 10 years; after that, every 60,000 km or 3 years										
	Others					R							R
Engine coolant level	I	I	I	I	I	I	I	I	I	I	I	I	I

FUEL SYSTEM

--	--	--	--	--	--	--	--	--	--	--	--	--	--

Air cleaner element		C		R		C		R		C		R
Fuel lines and hoses				I <sup>*2</sup>								I
Hoses and tubes for emission				I <sup>*2</sup>								I
Fuel filter				R								R
IGNITION SYSTEM												
Spark plugs	Replace every 60,000 km											
ELECTRICAL SYSTEM												
Function of all lights	I	I	I	I	I	I	I	I	I	I	I	I
CHASSIS and BODY												
Brake lines, hoses and connections				I				I				I
Brake fluid level		I				I		I		I		
Brake fluid				R								R
Disc brakes		I		I		I		I		I		I
Tire (Rotation)	Rotate every 10,000 km											
Tire inflation pressure and tire wear		I		I		I		I		I		I
Flat tire repair kit (if installed) <sup>*3</sup>	Inspect annually											
Steering operation and linkages		I		I		I		I		I		I
Power steering fluid level		I		I		I		I		I		I
Front and rear suspension, ball joints and wheel bearing axial play				I				I				I
Manual transmission oil				R								R
Rear differential oil				R								R
Drive shaft dust boots				I				I				I

Exhaust system and heat shields			I			I				I
Bolts and nuts on chassis and body			T			T				T
All locks and hinges		L	L		L	L		L		L
Washer fluid level		I	I		I	I		I		I

### Chart symbols

- **I**: Inspect: Inspect and clean, repair, adjust, or replace if necessary.
- **R**: Replace
- **L**: Lubricate
- **C**: Clean
- **T**: Tighten

### Remarks

- After the prescribed period, continue to follow the described maintenance at the recommended intervals.
- Refer below for a description of items marked\* in the maintenance chart.
  - \*1: Use FL22 type coolant in vehicles with the inscription "FL22" on the radiator cap itself or the surrounding area. Use FL22 when replacing the coolant.
  - \*2: According to state/provincial and federal regulations, failure to perform maintenance on these items will not void your emissions warranties. However, Mazda recommends that all maintenance services be performed at the recommended time or kilometer period to ensure long-term reliability.
  - \*3: Check the tire repair fluid expiration date every year when performing the periodic maintenance. Replace the tire repair fluid bottle with new one before the expiration date.

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## 2008 - MX-5 - General Information

### JACKING POSITIONS

#### WARNING:

- Improperly jacking a vehicle is dangerous. The vehicle can slip off the jack and cause serious injury. Use only the correct front and rear jacking points and block the wheels.
- Use safety stands to support the vehicle after it has been lifted.

#### Front

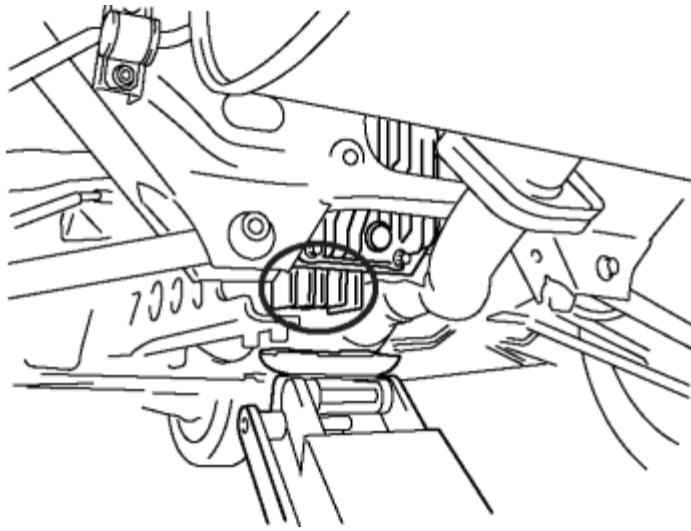
#### NOTE:

- To prevent obstruction between the jack body and front bumper when the jack body is inserted, use a low-floor type jack.
- Near the center of the front crossmember.



#### Rear

- At the center of the rear differential.



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## 2008 - MX-5 - General Information

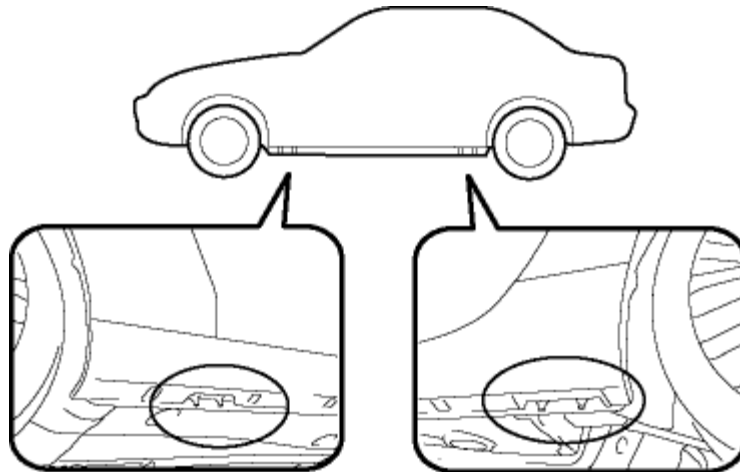
### VEHICLE LIFT (2 SUPPORTS) AND SAFETY STAND (RIGID RACK) POSITION

#### Vehicle Lift Positions

Front and rear

#### WARNING:

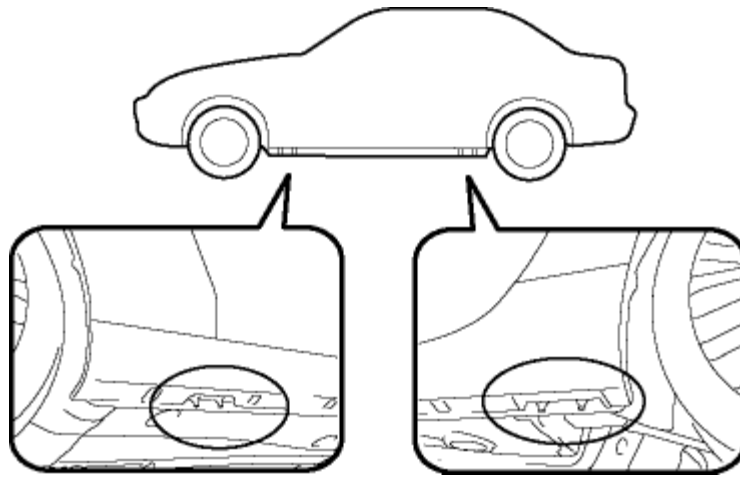
- Unstably lifting a vehicle is dangerous. The vehicle can slip off the lift and cause serious injury and/or vehicle damage. Make sure that the vehicle is on the lift horizontally by adjusting the height of support at the end of the arm of the lift.
- Both sides of the vehicle, on side sills



#### Safety Stand Positions

Front and rear

- Both sides of the vehicle, on side sills



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2008 - MX-5 - General Information

UNITS

Electric current	A (ampere)	Torque	N·m (Newton meter)
Electric power	W (watt)		kgf·m (kilogram force meter)
Electric resistance	ohm		kgf·cm (kilogram force centimeter)
Electric voltage	V (volt)		ft·lbf (foot pound force)
Length	mm (millimeter)		in·lbf (inch pound force)
	in (inch)	Volume	L (liter)
Negative pressure	kPa (kilo pascal)		US gal (U.S. gallon)
	mmHg (millimeters of mercury)		US qt (U.S. quart)
	inHg (inches of mercury)		Imp gal (Imperial gallon)
Positive pressure	kPa (kilo pascal)		Imp qt (Imperial quart)
	kgf/cm <sup>2</sup> (kilogram force per square centimeter)	ml (milliliter)	
		cc (cubic centimeter)	
		cu in (cubic inch)	
		psi (pounds per square inch)	fl oz (fluid ounce)
Number of revolutions	rpm (revolutions per minute)	Weight	N (newton)
			g (gram)
			oz (ounce)

## Conversion to SI Units (Système International d'Unités)

- All numerical values in this manual are based on SI units. Numbers shown in conventional units are converted from these values.

## Rounding Off

- Converted values are rounded off to the same number of places as the SI unit value. For example, if the SI unit value is 17.2 and the value after conversion is 37.84, the converted value will be rounded off to 37.8.

## Upper and Lower Limits

- When the data indicates upper and lower limits, the converted values are rounded down if the SI unit value is an upper limit and rounded up if the SI unit value is a lower limit. Therefore, converted values for the same SI unit value may differ after conversion. For example, consider 2.7 kgf/cm<sup>2</sup> in the following specifications:

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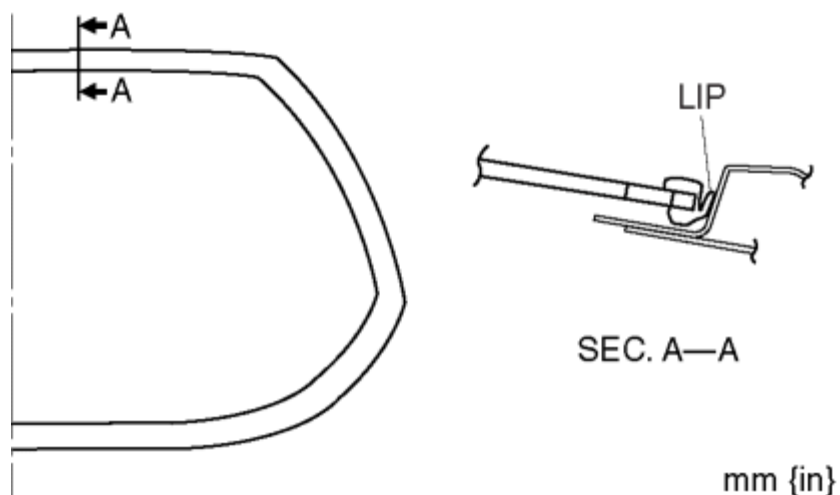
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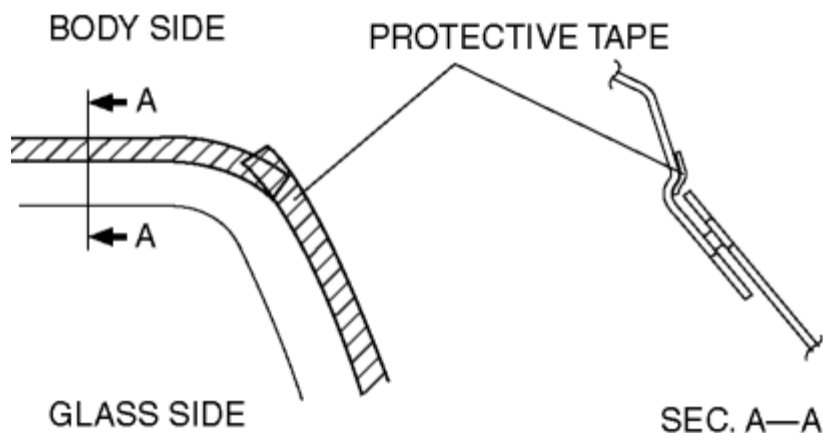
## 2008 - MX-5 - Body and Accessories

### REAR WINDOW GLASS REMOVAL [DETACHABLE HARDTOP]

1. Remove the battery cover.
2. Remove the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the detachable hardtop.
4. Remove the B-pillar garnish. (See [DETACHABLE HARDTOP DISASSEMBLY/ASSEMBLY](#).)
5. Remove the side lock. (See [DETACHABLE HARDTOP DISASSEMBLY/ASSEMBLY](#).)
6. Remove the B-pillar upper trim. (See [B-PILLAR UPPER TRIM REMOVAL \[DETACHABLE HARDTOP\]](#).)
7. Remove the rear trim. (See [REAR TRIM REMOVAL \[DETACHABLE HARDTOP\]](#).)
8. Remove the rear deck lock. (See [DETACHABLE HARDTOP DISASSEMBLY/ASSEMBLY](#).)
9. Cut the rear window molding lip using a razor.



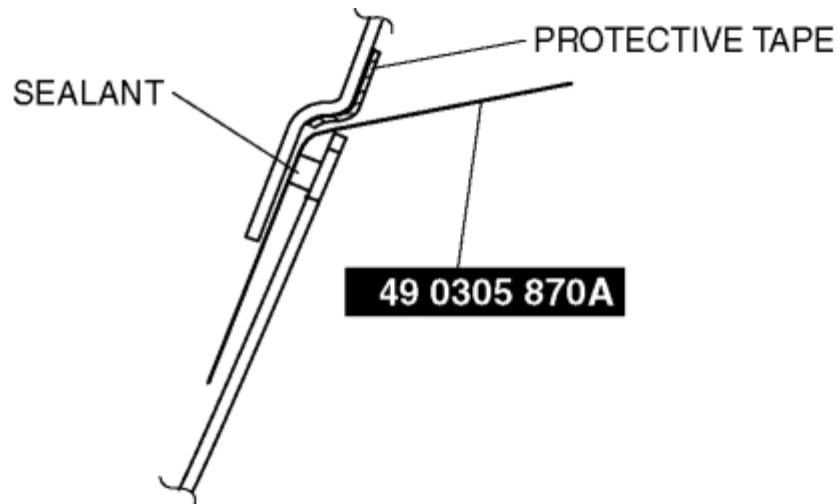
10. Apply protective tape along the edge of the body.



**NOTE:**

- Overlap and adhere the protective tape to the corners to prevent damage.

11. Insert the **SST** (piano wire), which has been cut to sufficient length from inside the vehicle.



**WARNING:**

1. Using the **SST** (piano wire) with bare hands can cause injury. Always wear gloves when using the **SST** (piano wire).

**NOTE:**

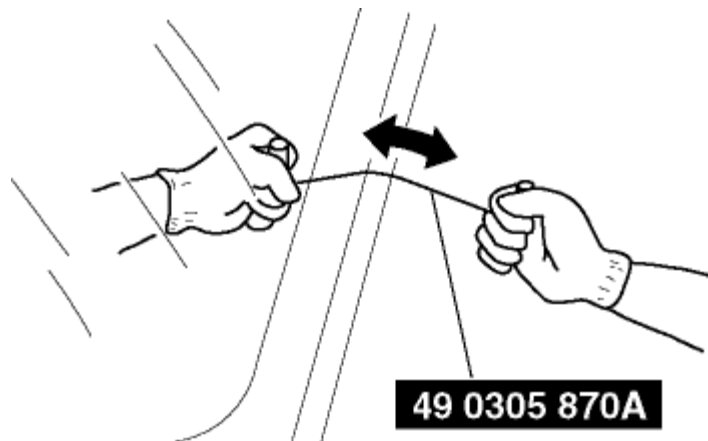
- Before removing the rear window glass from the body, mark the position of the glass by affixing tape to the glass and body panel.

12. Wind each end of the **SST** (piano wire) around a bar.

**NOTE:**

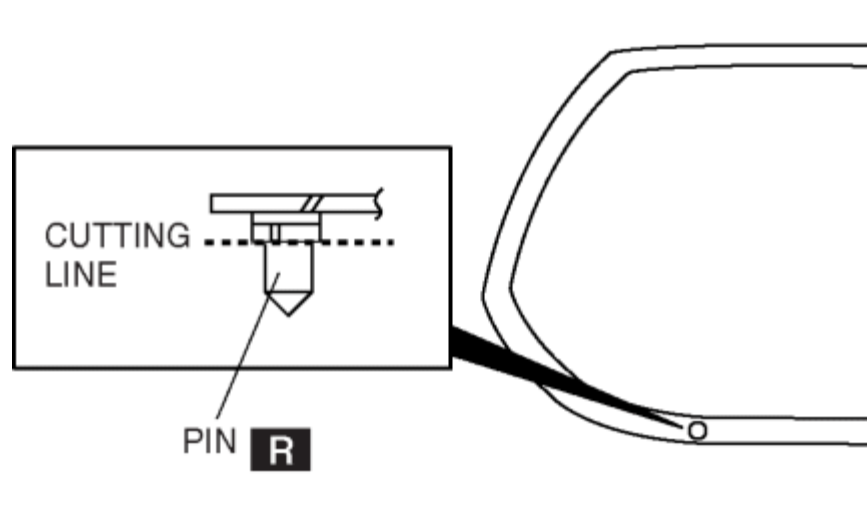
- Use a long sawing action to spread the work over the whole length of the **SST** (piano wire) to prevent it from breaking due to localized heating.

13. Secure one end of the **SST** (piano wire), and while pulling the other end, cut the sealant around the rear window glass.



14. Cut the pins out.





15. Remove the rear window glass.
16. Mark the seating positions of the pins and remove the pins from the rear window glass.
17. Remove the rear window molding from the rear window glass.

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## 2008 - MX-5 - Body and Accessories

### REAR WINDOW GLASS INSTALLATION [DETACHABLE HARDTOP]

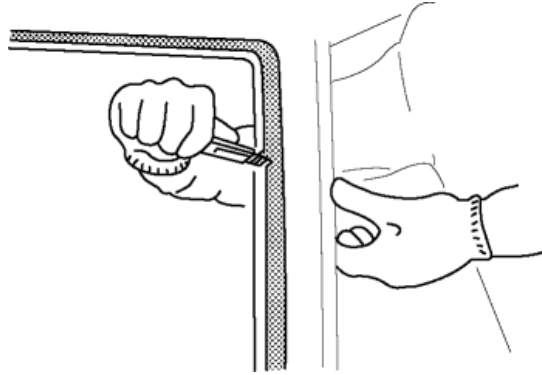
#### CAUTION:

- Proper installation of the rear window glass may be difficult if sealant is cracked or the glass is pushed out by air pressure when a door is opened/closed with all the window glass closed. Leave all the windows open until the rear window glass is installed completely.

1. Cut away the old sealant using a razor so that a **1—2 mm {0.04—0.07 in}** thickness of sealant remains along the perimeter of the frame.

#### WARNING:

- Using a razor with bare hands can cause injury. Always wear gloves when using a razor.



2. If the sealant has come off completely in any one place, apply some primer after degreasing, and allow it to dry for **approx. 30 min.** Then apply a **2 mm {0.08 in}** thickness of sealant.

3. Clean and degrease the perimeter **approx. 50 mm {1.97 in}** from the glass end and the bonding area on the body.

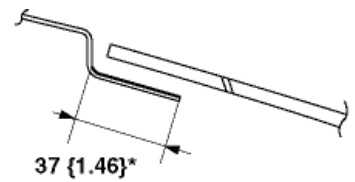
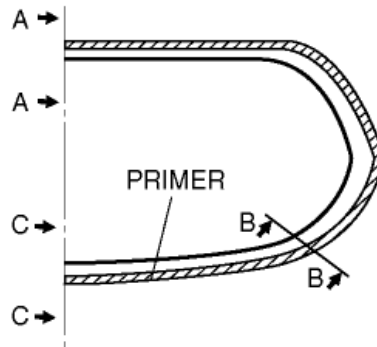
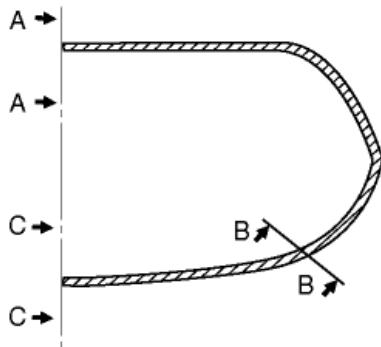
4. Apply glass primer on the rear window glass, and body primer as shown in the figure. Allow it to dry for **approx. 30 min.**

#### CAUTION:

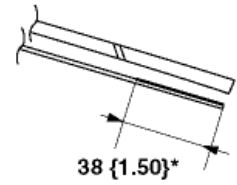
- Keep the area free of dirt and grease, and do not touch the surface. Otherwise, the primer may not properly bond to the surface of the glass and body, which may cause leakage.

BODY SIDE

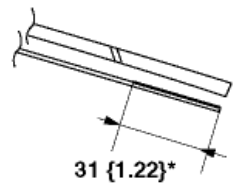
REAR WINDOW GLASS SIDE



SEC. A—A



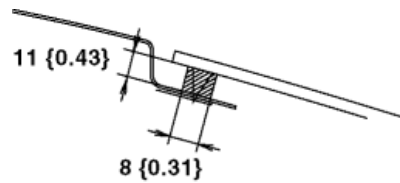
SEC. B—B



SEC. C—C

\*: POSSIBLE PRIMER APPLICATION AREA mm {in}

5. Apply sealant to the area of the glass surface as shown in the figure.

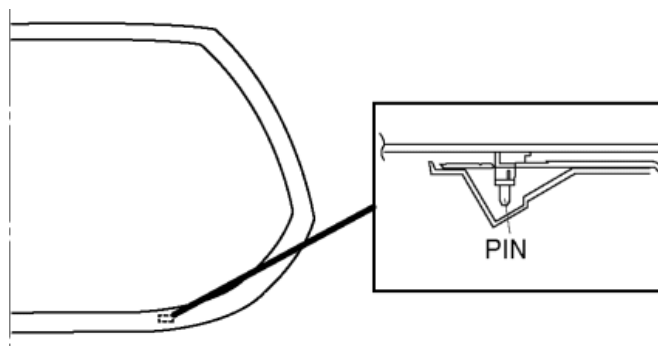


APPLY SEALANT TO THIS AREA.

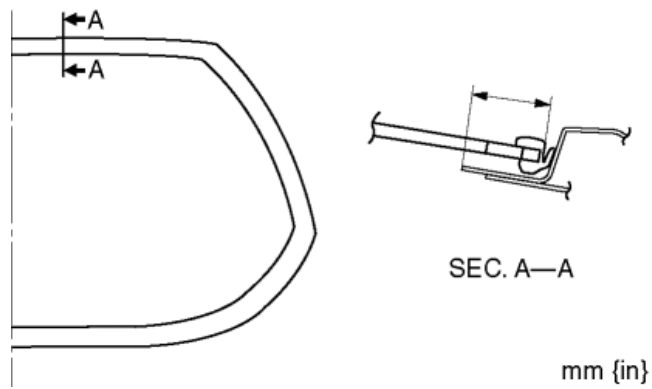
mm {in}

6. Insert the positioning pins into the body, then install the rear window.

7. Press the rear window pins to engage the tabs to the body.



8. Press completely along the perimeter of the glass so that the measurement of the molding lip gap is within the specification.



9. Connect the filament connector.

10. Install the following parts:

- a. Rear deck lock cover (See [DETACHABLE HARDTOP ADJUSTMENT.](#))
- b. Rear trim (See [REAR TRIM INSTALLATION \[DETACHABLE HARDTOP\].](#))
- c. B-pillar upper trim (See [B-PILLAR UPPER TRIM INSTALLATION \[DETACHABLE HARDTOP\].](#))
- d. Side lock (See [DETACHABLE HARDTOP DISASSEMBLY/ASSEMBLY.](#))
- e. B-pillar garnish (See [DETACHABLE HARDTOP DISASSEMBLY/ASSEMBLY.](#))
- f. Detachable hardtop

11. Allow the sealant to harden completely. Sealant hardening time: 24 h

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## 2008 - MX-5 - Body and Accessories

### POWER WINDOW MAIN SWITCH INSPECTION [POWER RETRACTABLE HARDTOP]

#### With Exterior Open function

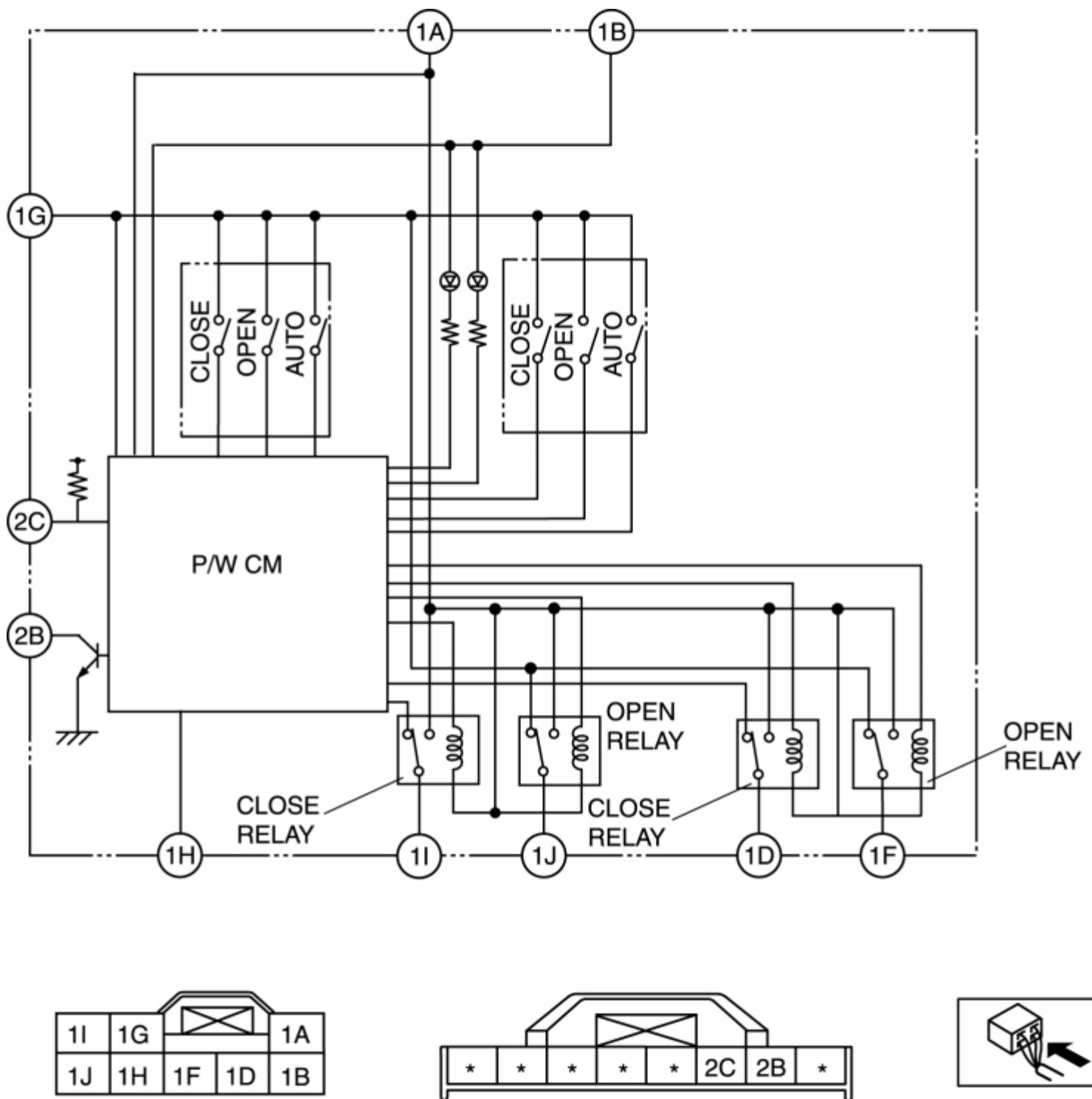
1. Disconnect the negative battery cable.
2. Remove the console. (See [CONSOLE REMOVAL/INSTALLATION](#).)
3. Remove the power window main switch. (See [POWER WINDOW MAIN SWITCH REMOVAL/INSTALLATION](#).)
4. Connect the power window main switch connector.
5. Connect the negative battery cable.
6. Verify that the voltages of each of the terminals are as indicated in the terminal voltage table.
  - If the voltage is not as specified in the terminal voltage table (reference), inspect the parts under Inspection item(s) and related wiring harnesses.
    - If the system does not work normally even though the inspection items or related wiring harnesses do not have any malfunction, replace the power window main switch. (See [Terminal Voltage Table \(Reference\)](#).)

#### Terminal Voltage Table (Reference)

Terminal	Signal name	Connected to	Measured condition	Voltage (V)	Inspection item (s)
1A	Power supply	P.WIND2 20 A fuse	Under any condition	B+	<ul style="list-style-type: none"> <li>P.WIND2 20 A fuse</li> <li>Related wiring harnesses</li> </ul>
1B	IG 1	METER 15 A fuse	Ignition switch is at ON position	B+	<ul style="list-style-type: none"> <li>Inspect METER 15 A fuse</li> <li>Related wiring harnesses</li> </ul>
			Ignition switch is at LOCK position	1.0 or less	

1D	Close output	Power window motor	While door glass is opening	1.0 or less	<ul style="list-style-type: none"> <li>Power window motor (See <a href="#">POWER WINDOW MOTOR INSPECTION.</a>)</li> <li>Related wiring harnesses</li> </ul>
			While door glass is closing	B+	
1F	Open output	Power window motor	While door glass is opening	B+	<ul style="list-style-type: none"> <li>Power window motor (See <a href="#">POWER WINDOW MOTOR INSPECTION.</a>)</li> <li>Related wiring harnesses</li> </ul>
			While door glass is closing	1.0 or less	
1G	GND	Body ground	Under any condition	1.0 or less	<ul style="list-style-type: none"> <li>GND</li> </ul>
1H	Communication	Keyless control module	Because this terminal is for communication, good/no good judgment by terminal voltage is not possible.		<ul style="list-style-type: none"> <li>Keyless control module</li> </ul>
1I	Close output	Power window motor	While door glass is opening	1.0 or less	<ul style="list-style-type: none"> <li>Power window motor (See <a href="#">POWER WINDOW MOTOR INSPECTION.</a>)</li> <li>Related wiring harnesses</li> </ul>
			While door glass is closing	B+	
1J	Open output	Power window motor	While door glass is opening	B+	<ul style="list-style-type: none"> <li>Power window motor (See <a href="#">POWER WINDOW MOTOR INSPECTION.</a>)</li> <li>Related wiring harnesses</li> </ul>
			While door glass is closing	1.0 or less	

2B	Door glass open complete signal	Power retractable hardtop control module	Instant when door glass open operation is completed after RHT switch is operation	1.0 or less (SeeReference.)	<ul style="list-style-type: none"><li>Power retractable hard top control module</li><li>Related wiring harnesses</li></ul>
			Other	B+	
2C	Door glass open request signal	Power retractable hardtop control module	While RHT switch is pressed	1.0 or less	<ul style="list-style-type: none"><li>Power retractable hard top control module</li><li>Related wiring harnesses</li></ul>
			While RHT switch is not pressed	B+	



### Without Exterior Open function

1. Disconnect the negative battery cable.
2. Remove the console. (See [CONSOLE REMOVAL/INSTALLATION](#).)
3. Remove the power window main switch. (See [POWER WINDOW MAIN SWITCH REMOVAL/INSTALLATION](#).)
4. Connect the power window main switch connector.



5. Connect the negative battery cable.

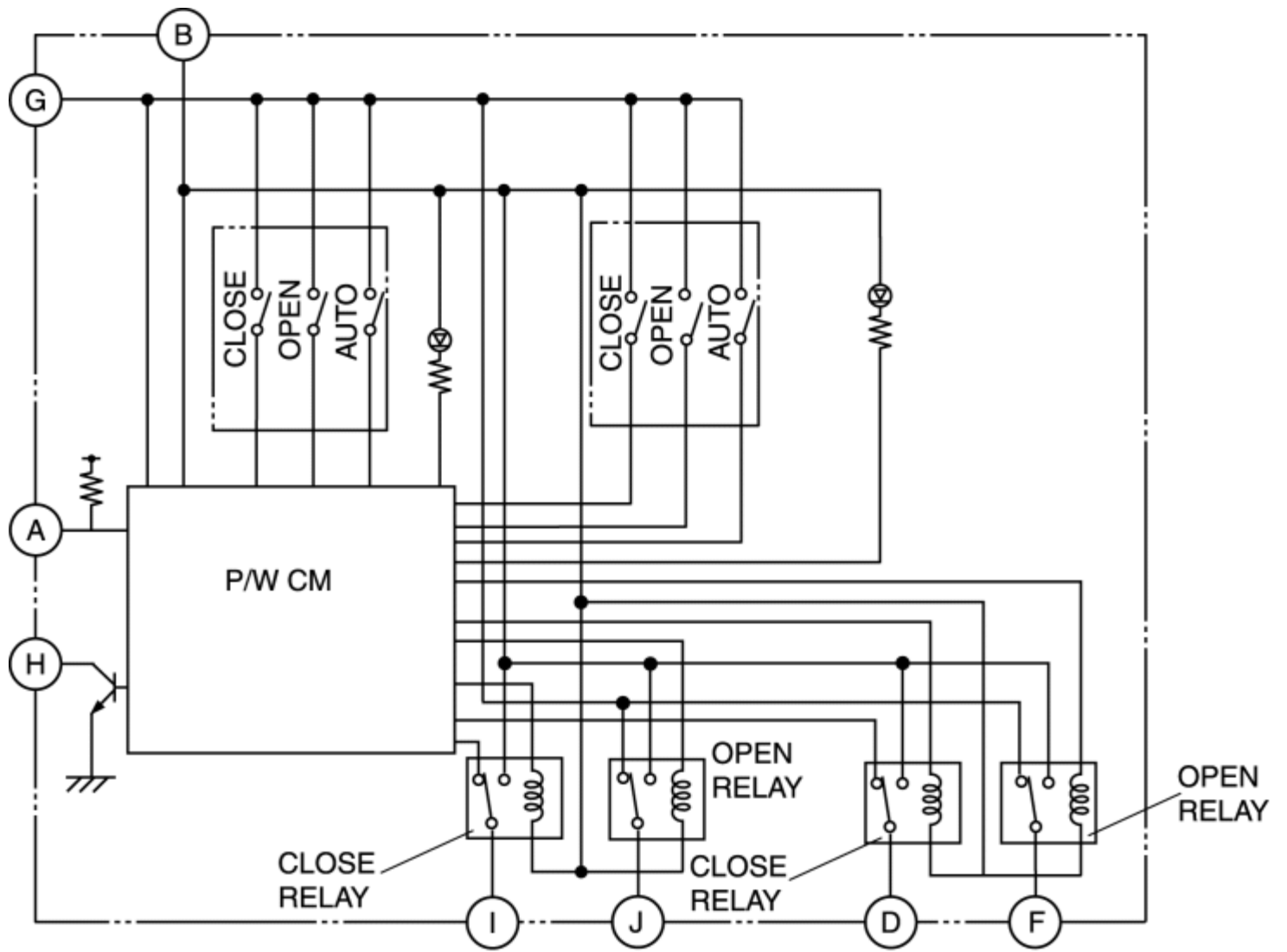
6. Verify that the voltages of each of the terminals are as indicated in the terminal voltage table.

- If the voltage is not as specified in the terminal voltage table (reference), inspect the parts under Inspection item(s) and related wiring harnesses.
  - If the system does not work normally even though the inspection items or related wiring harnesses do not have any malfunction, replace the power window main switch. (See [Terminal Voltage Table \(Reference\)](#).)

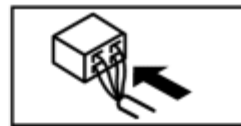
#### Terminal Voltage Table (Reference)

Terminal	Signal name	Connected to	Measured condition	Voltage (V)/Continuity	Inspection item (s)
B	IG 1	P.WIND 20 A fuse	Ignition switch is at ON position	B+	<ul style="list-style-type: none"> <li>Inspect P.WIND 20 A fuse</li> <li>Related wiring harnesses</li> </ul>
			Ignition switch is at LOCK position	1.0 or less	
D	Close output	Power window motor	While door glass is opening	1.0 or less	<ul style="list-style-type: none"> <li>Power window motor (See <a href="#">POWER WINDOW MOTOR INSPECTION</a>.)</li> <li>Related wiring harnesses</li> </ul>
			While door glass is closing	B+	
F	Open output	Power window motor	While door glass is opening	B+	<ul style="list-style-type: none"> <li>Power window motor (See <a href="#">POWER WINDOW MOTOR INSPECTION</a>.)</li> <li>Related wiring harnesses</li> </ul>
			While door glass is closing	1.0 or less	
G	GND	Body ground	Under any condition	1.0 or less	<ul style="list-style-type: none"> <li>GND</li> </ul>

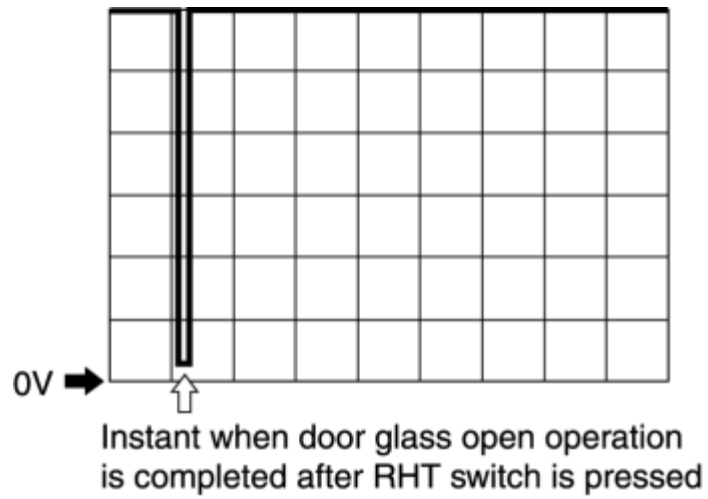
I	Close output	Power window motor	While door glass is opening	1.0 or less	<ul style="list-style-type: none"><li>Power window motor (See <a href="#">POWER WINDOW MOTOR INSPECTION.</a>)</li><li>Related wiring harnesses</li></ul>
			While door glass is closing	B+	
J	Open output	Power window motor	While door glass is opening	B+	<ul style="list-style-type: none"><li>Power window motor (See <a href="#">POWER WINDOW MOTOR INSPECTION.</a>)</li><li>Related wiring harnesses</li></ul>
			While door glass is closing	1.0 or less	
A	Door glass open complete signal	Power retractable hardtop	While RHT switch is pressed	1.0 or less	<ul style="list-style-type: none"><li>Power retractable hard top control module</li><li>Related wiring harnesses</li></ul>
			While RHT switch is not pressed	B+	
H	Door glass open request signal	Power retractable hardtop	Instant when door glass open operation is completed after RHT switch is operation	1.0 or less (See <a href="#">Reference.</a> )	<ul style="list-style-type: none"><li>Power retractable hard top control module</li><li>Related wiring harnesses</li></ul>
			Other	B+	



I	G			A
J	H	F	D	B



Reference



- Terminal connected:
  - Vehicles with exterior open function: 2B (+) — Body ground
  - Vehicles without exterior open function: H (+) — Body ground
- Oscilloscope setting: 2V/DIV (Y) : 500 ms/DIV (X), DC range
- Measurement condition: RHT switch is pressed

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## 2008 - MX-5 - Body and Accessories

### REAR WINDOW GLASS REMOVAL/INSTALLATION [POWER RETRACTABLE HARDTOP]

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the following parts:
  - a. Console (See [CONSOLE PANEL REMOVAL/INSTALLATION.](#))
  - b. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION.](#))
  - c. Scuff plate (See [SCUFF PLATE REMOVAL/INSTALLATION.](#))
  - d. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION.](#))
  - e. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION.](#))
  - f. Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION.](#))
  - g. Back trim (See [BACK TRIM REMOVAL/INSTALLATION.](#))
  - h. Seat belt upper anchor installation bolt (See [SEAT BELT REMOVAL/INSTALLATION.](#))
  - i. Power retractable hardtop link bracket (See [POWER RETRACTABLE HARDTOP LINK BRACKET REMOVAL/INSTALLATION.](#))
  - j. Rear side trim (See [REAR SIDE TRIM REMOVAL/INSTALLATION.](#))
  - k. Cab-side weatherstrip (See [CONVERTIBLE TOP DISASSEMBLY/ASSEMBLY.](#))
  - l. Power retractable hardtop (See [POWER RETRACTABLE HARDTOP REMOVAL/INSTALLATION.](#))

#### NOTE:

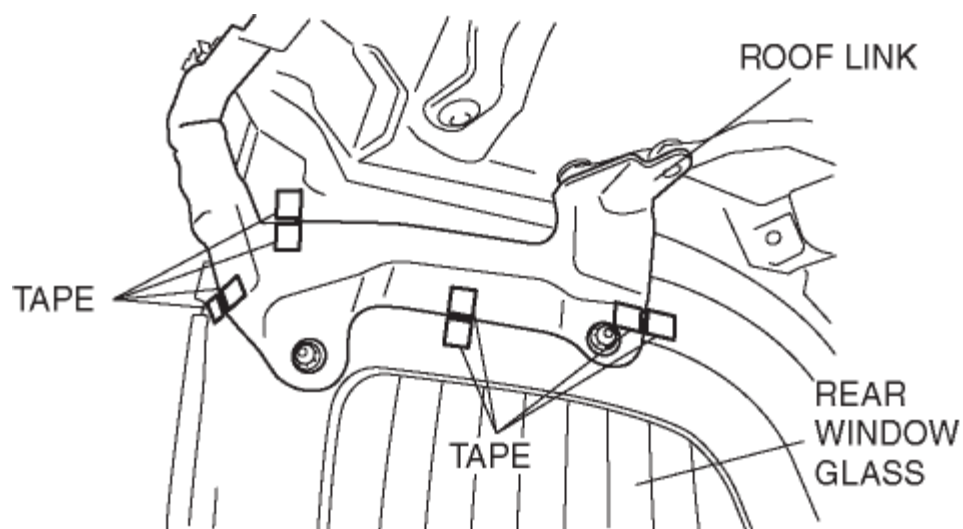
- The number of shims varies depending on the location of the rear window glass installation nut. Adjustment will be easier by verifying the number of shims to be used before removing the rear window glass.

4. Disconnect the filament connector.
5. If the rear window glass or the middle roof panel is to be reused, remove it using the following procedure.

#### NOTE:

- If the rear window glass or middle roof panel is to be used, positioning and adjustment during installation will be easier by placing marks for the installation before removal.
- Placing marks is not necessary if the rear window glass or middle roof panel is to be replaced with a new one because there will be no marked positions.

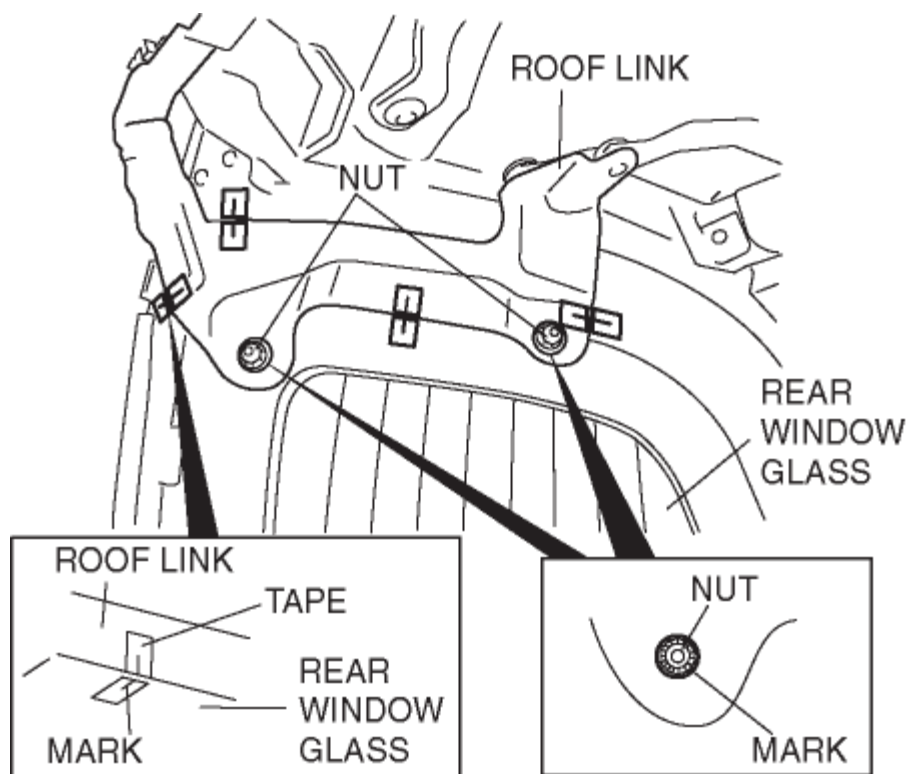
a. Affix masking tape to the position shown in the figure.



**NOTE:**

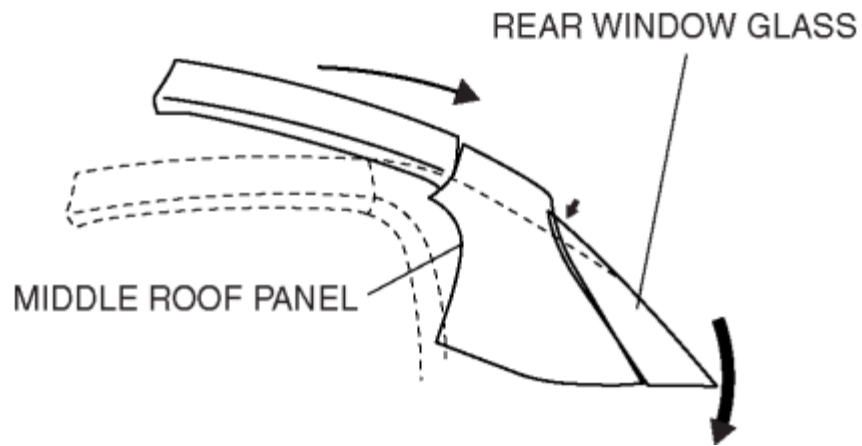
- Mark the roof link and rear window glass at 4 locations as shown in the figure.

b. Apply positioning marks to the masking tape.

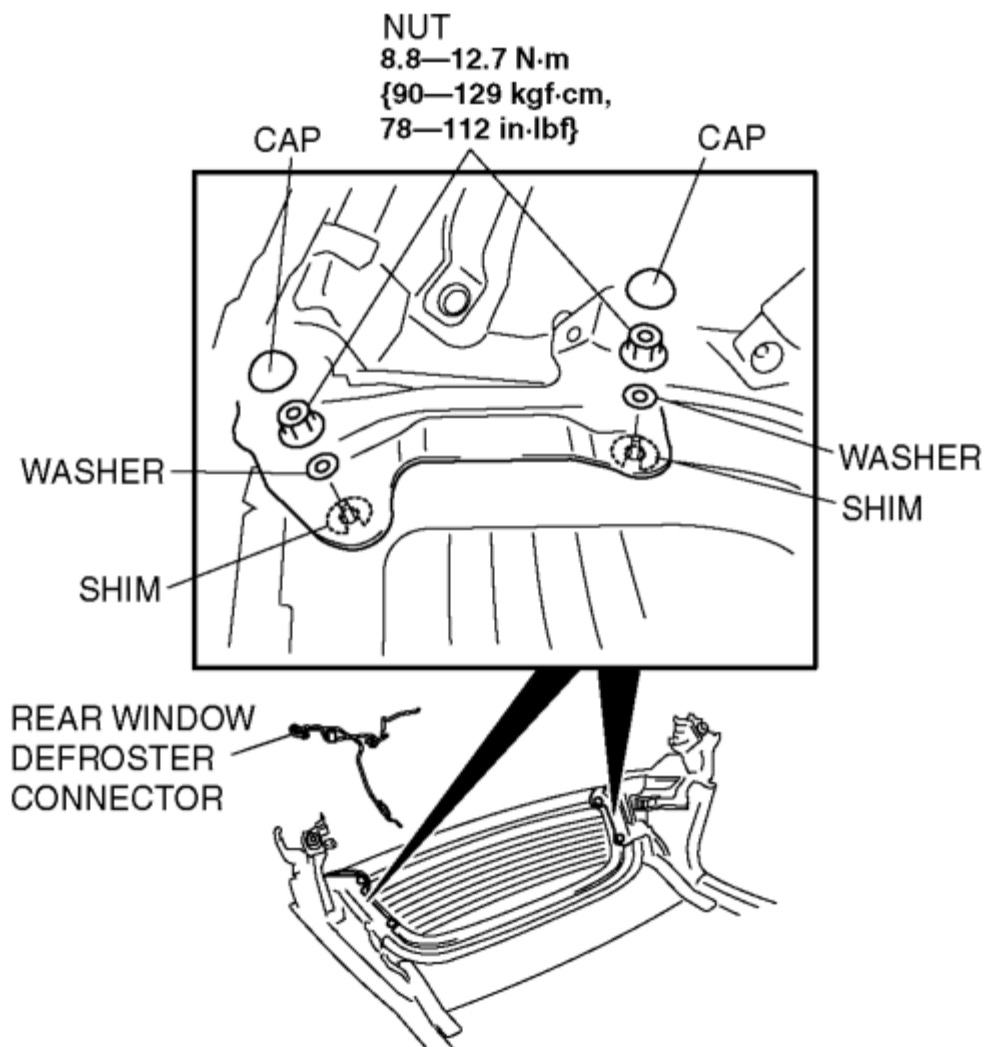


c. Apply a positioning mark to the exterior circumference of the nuts.

6. Move the power retractable hardtop in the open direction as shown in the figure until it is separated from the middle roof panel.



7. Remove the cap.



8. Remove the nuts and washers.

9. Remove the shims.

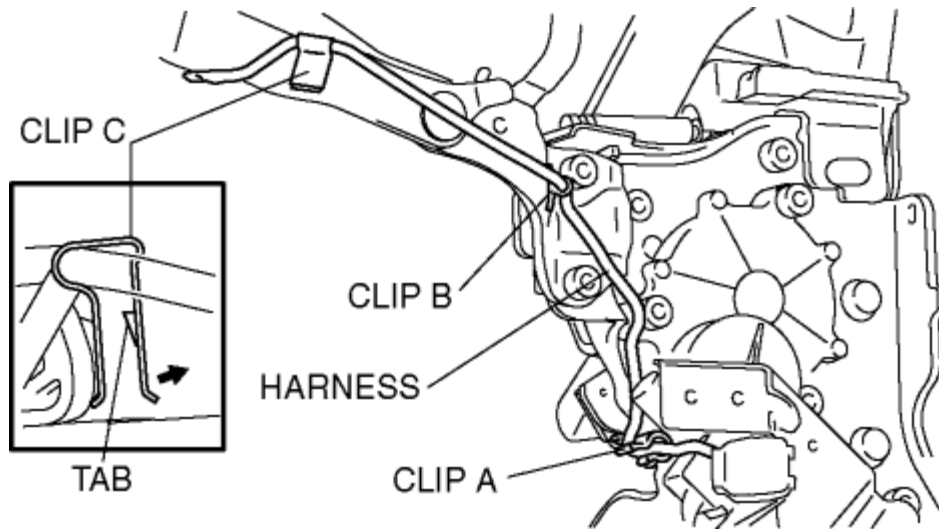
10. Remove the rear window glass.

11. Remove the rear window defroster connector. (See [Rear Window Defroster connector Removal Note](#).)

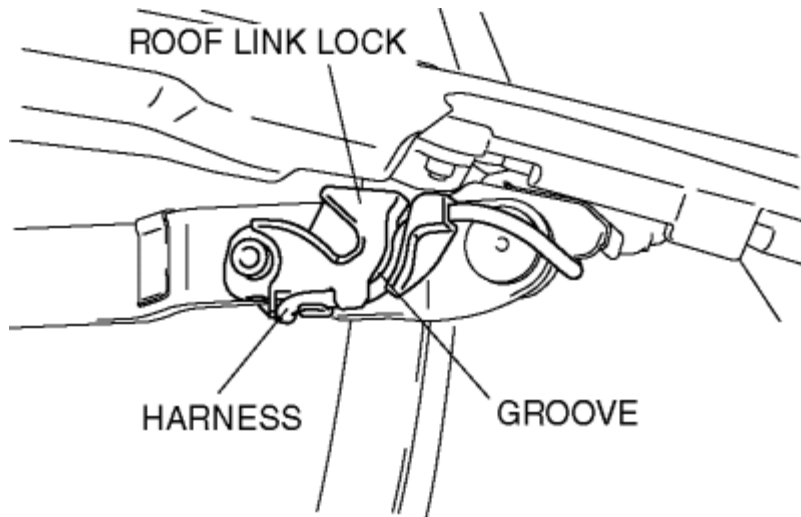
12. Install in the reverse order of removal. (See [Rear Window Glass Installation Note](#).)

## Rear Window Defroster connector Removal Note

1. Remove the connector from the roof motor bracket.
2. Remove the wiring harness from clip A.

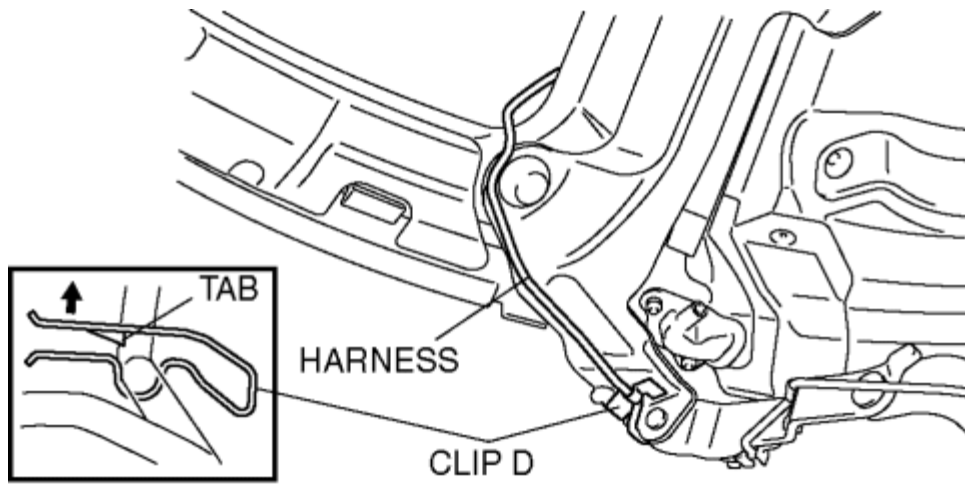


3. Remove clip B, then remove clip C while pulling it in the direction shown by the arrow avoiding the tab.
4. Remove the wiring harness from the roof link lock groove.



5. Remove clip D while pulling it in the direction shown by the arrow avoiding the tab.





## Rear Window Glass Installation Note

### Rear window glass or middle roof panel is newly replaced

1. Adjust the rear window glass and middle roof panel gap and height difference so that it is within the specification. (See [POWER RETRACTABLE HARDTOP ADJUSTMENT](#).)

### Rear window glass or middle roof panel is reused

1. Install the shim according to the number verified prior to removal.
2. Align the alignment marks applied before the rear window glass removal, install the rear window glass, and then remove the masking tape.
3. Refer to POWER RETRACTABLE HARDTOP ADJUSTMENT and verify that the gap and height difference between the rear window glass and middle roof panel are within the specifications. Adjust the power retractable hardtop if necessary. (See [POWER RETRACTABLE HARDTOP ADJUSTMENT](#).)

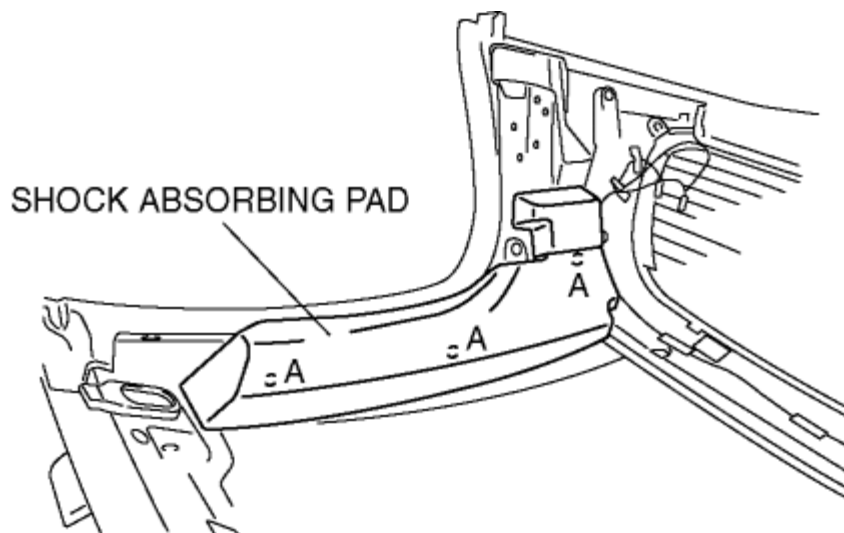
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## 2008 - MX-5 - Body and Accessories

### SHOCK ABSORBING PAD REMOVAL/INSTALLATION [DETACHABLE HARDTOP]

1. Remove the detachable hardtop.
2. Remove the following parts:
  - a. B-pillar garnish (See [DETACHABLE HARDTOP DISASSEMBLY/ASSEMBLY](#).)
  - b. Side lock (See [DETACHABLE HARDTOP DISASSEMBLY/ASSEMBLY](#).)
  - c. B-pillar upper trim (See [B-PILLAR UPPER TRIM REMOVAL \[DETACHABLE HARDTOP\]](#), [B-PILLAR UPPER TRIM INSTALLATION \[DETACHABLE HARDTOP\]](#).)
  - d. Male wedge cover (See [DETACHABLE HARDTOP DISASSEMBLY/ASSEMBLY](#).)
  - e. Top lock cover (See [DETACHABLE HARDTOP DISASSEMBLY/ASSEMBLY](#).)
  - f. Headliner (See [HEADLINER REMOVAL/INSTALLATION \[DETACHABLE HARDTOP\]](#).)
3. Pull the shock absorbing pad rearward and detach clips A.

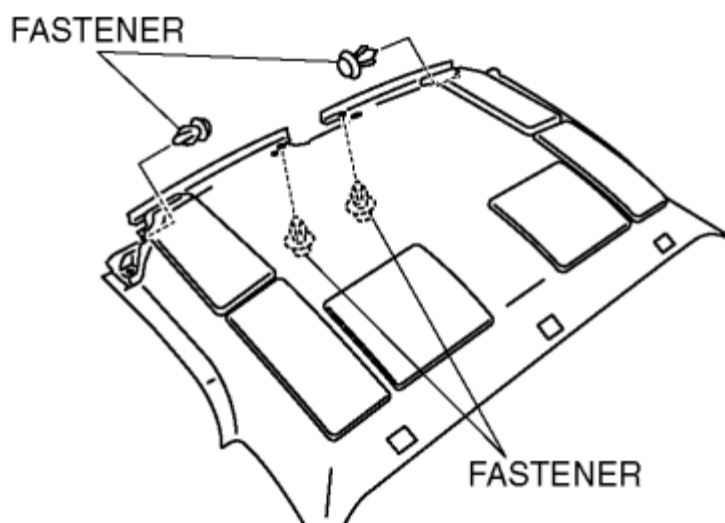


4. Remove the shock-absorbing pad.
5. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### HEADLINER REMOVAL/INSTALLATION [DETACHABLE HARDTOP]

1. Remove the detachable hardtop.
2. Remove the following parts:
  - a. B-pillar garnish. (See [DETACHABLE HARDTOP DISASSEMBLY/ASSEMBLY](#).)
  - b. Side lock. (See [DETACHABLE HARDTOP DISASSEMBLY/ASSEMBLY](#).)
  - c. B-pillar upper trim. (See [B-PILLAR UPPER TRIM REMOVAL \[DETACHABLE HARDTOP\]](#).)
  - d. Male wedge cover. (See [DETACHABLE HARDTOP DISASSEMBLY/ASSEMBLY](#).)
  - e. Top lock cover. (See [DETACHABLE HARDTOP DISASSEMBLY/ASSEMBLY](#).)
3. Remove the fasteners.

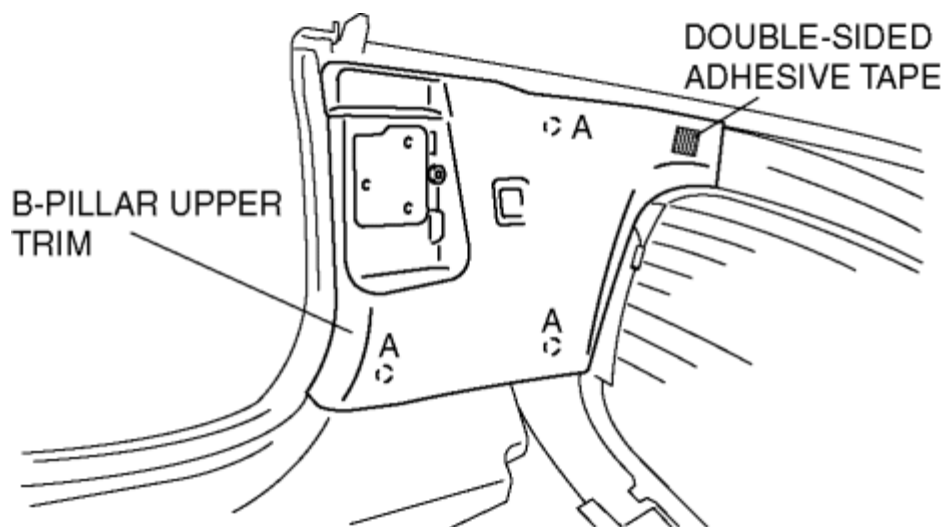


4. Pull the headliner outward and remove it.
5. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### B-PILLAR UPPER TRIM REMOVAL [DETACHABLE HARDTOP]

1. Remove the detachable hardtop.
2. Remove the B-pillar garnish. (See [DETACHABLE HARDTOP DISASSEMBLY/ASSEMBLY](#).)
3. Remove the side lock. (See [DETACHABLE HARDTOP DISASSEMBLY/ASSEMBLY](#).)
4. Disengage the B-pillar upper trim clips A using a fastener remover.



5. While cutting the double sided adhesive tape using a screwdriver or a razor, separate the B-pillar upper trim from the body.

#### **WARNING:**

- Using a razor with bare hands can cause injury. Always wear gloves when using a razor.

6. Remove the B-pillar upper trim.

## 2008 - MX-5 - Body and Accessories

### B-PILLAR UPPER TRIM INSTALLATION [DETACHABLE HARDTOP]

#### NOTE:

- Double sided adhesive tape has already been attached to the new rear door garnish.

#### WARNING:

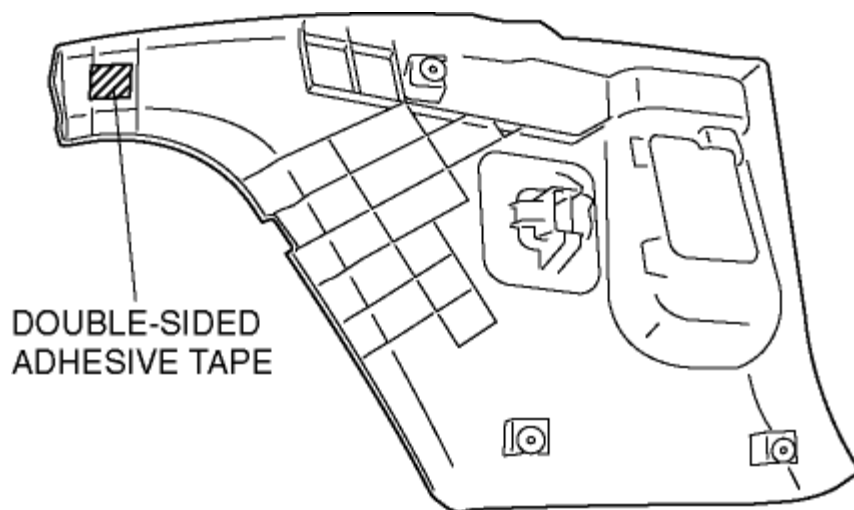
- Using a razor with bare hands can cause injury. Always wear gloves when using a razor.

1. When installing a new B-pillar upper trim, follow the procedure below:

- a. Remove the adhesive remaining on the body using razor.
- b. Remove any grease or dirt from the adhesion surface of the body.

2. When reusing the B-pillar upper trim, follow the procedure below:

- a. Remove the adhesive remaining on the B-pillar upper trim and the body using a razor.
- b. Remove any grease or dirt from the adhesion surface of the B-pillar upper trim and the body.
- c. Apply primer to the bonding area of the B-pillar upper trim.
- d. Attach double sided adhesive tape to the B-pillar upper trim as shown.



#### NOTE:

- Use 3M GT7108 double-sided adhesive tape or equivalent.

3. Peel off the backing of the double sided adhesive tape, then install the B-pillar upper trim to the detachable hardtop.



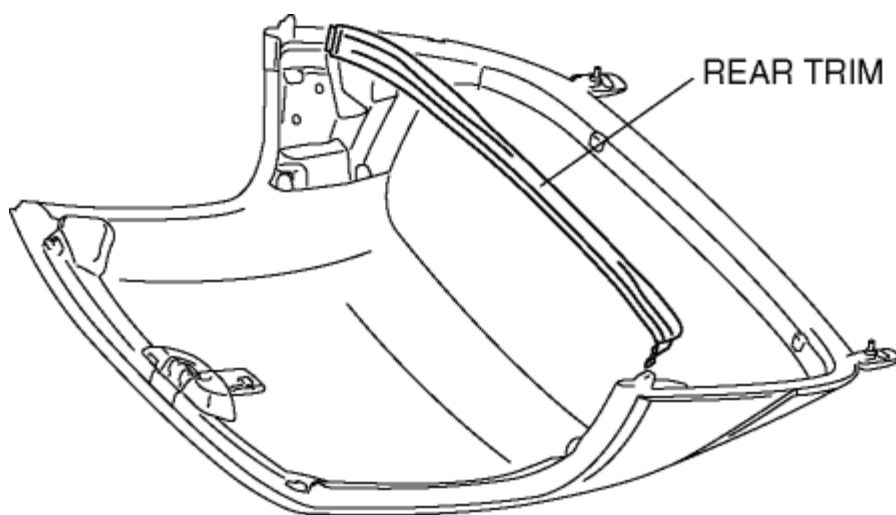
## 2008 - MX-5 - Body and Accessories

### REAR TRIM REMOVAL [DETACHABLE HARDTOP]

1. Remove the detachable hardtop.
2. Cut the double-sided adhesive tape using a flathead screwdriver or razor.

#### WARNING:

- Using a razor with bare hands can cause injury. Always wear gloves when using a razor.



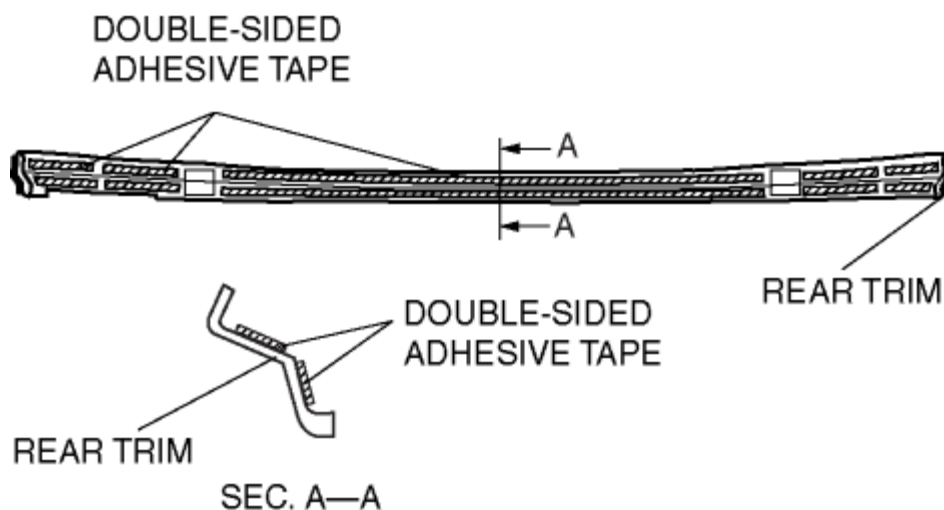
3. Remove the rear trim.

## 2008 - MX-5 - Body and Accessories

### REAR TRIM INSTALLATION [DETACHABLE HARDTOP]

#### NOTE:

- Double sided adhesive tape has already been attached to the new rear trim.
1. When installing a new rear trim, follow the procedure below:
    - a. Remove the double-sided tape from the detachable hardtop.
    - b. Remove any grease or dirt from the adhesion surface of the detachable hardtop.
  2. When reusing the rear trim, follow the procedure below:
    - a. Remove the double-sided adhesive tape from the rear trim and detachable hardtop.
    - b. Remove any grease or dirt from the adhesion surface of the rear trim and the detachable hardtop.
    - c. Attach double sided adhesive tape to the rear trim as shown.



#### NOTE:

- Use 3M GT7108 double-sided adhesive tape or equivalent.
3. Peel off the ends of the double-sided adhesive tape and attach the rear trim to the detachable hardtop.
  4. Peel off the tape backings from double-sided adhesive tape and attach it.

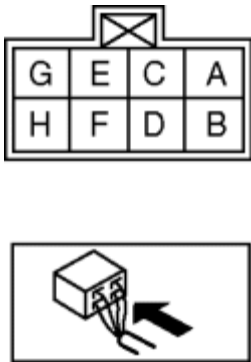


2008 - MX-5 - Body and Accessories

STEERING LOCK UNIT INSPECTION [ADVANCED KEYLESS SYSTEM]

1. Remove the column cover. (See [COLUMN COVER REMOVAL/INSTALLATION.](#))
2. Measure the voltage at each terminal.
  - If the voltage is not as specified in the Terminal Voltage Table (Reference), inspect the parts under "Inspection item(s)".
  - If there is any malfunction, inspect the parts under "Inspection item(s)".
    - If the system does not work properly even though the parts or related wiring harnesses do not have any malfunction, replace the steering lock unit.

Terminal Voltage Table (Reference)



Terminal	Signal name	Connected to	Measured condition	Voltage (V)	Inspection item(s)
A	Push switch signal	Keyless control module	Start knob pressed	B+	<ul style="list-style-type: none"><li>• Keyless control module</li><li>• Related wiring harnesses</li></ul>
			Start knob released	1.0 or less	
B	Power supply	Fuse	Under any condition	B+	<ul style="list-style-type: none"><li>• Fuse</li><li>• Related wiring harnesses</li></ul>

C	Key reminder switch signal	Keyless control module	Key inserted	B+	<ul style="list-style-type: none"> <li>• Keyless control module</li> <li>• Related wiring harnesses</li> </ul>
			Key removed	1.0 or less	
D	Power supply	Fuse	Under any condition	B+	<ul style="list-style-type: none"> <li>• Fuse</li> <li>• Related wiring harnesses</li> </ul>
E	Power supply	Fuse	Under any condition	B+	<ul style="list-style-type: none"> <li>• Fuse</li> <li>• Related wiring harnesses</li> </ul>
F	Ignition key illumination signal	Ignition key illumination bulb	Ignition switch off and driver-side door opened.	1.0 or less	<ul style="list-style-type: none"> <li>• Ignition key illumination bulb</li> <li>• Related wiring harnesses</li> </ul>
			<b>30 s or more</b> after driver-side door closed.	B+	
G	Serial communication	Keyless control module	Because this terminal is for communication good/no good judgment by terminal voltage is not possible.		Related wiring harnesses
H	GND	Body ground	Because this terminal is for communication good/no good judgment by terminal voltage is not possible.		Related wiring harnesses

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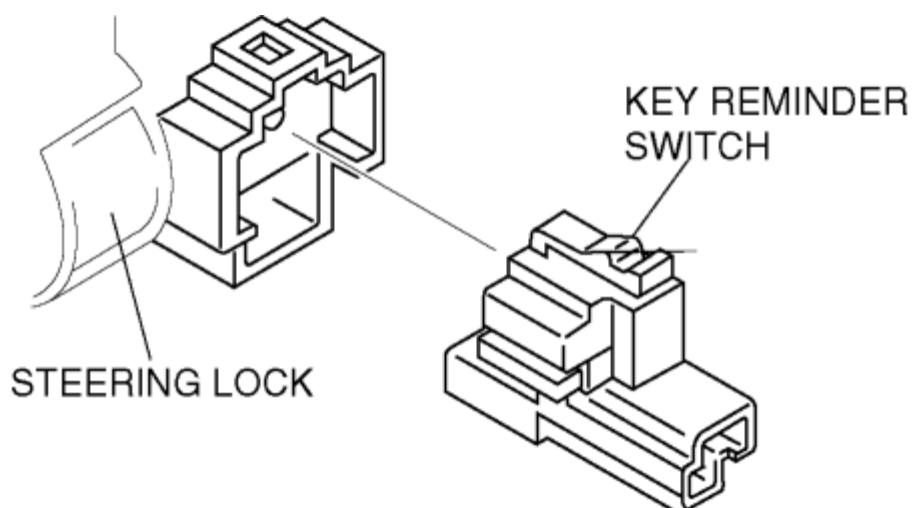
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## 2008 - MX-5 - Body and Accessories

### KEY REMINDER SWITCH REMOVAL/INSTALLATION [EXCEPT ADVANCED KEYLESS SYSTEM]

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the column cover. (See [COLUMN COVER REMOVAL/INSTALLATION.](#))
4. Disconnect the key reminder switch connector.
5. Remove the key reminder switch.

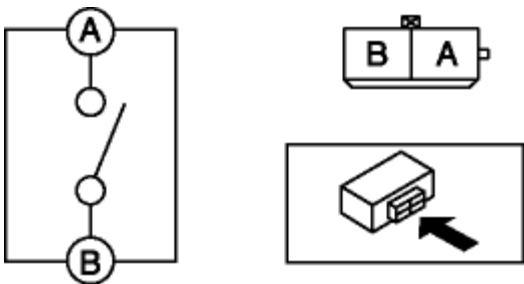


6. Install in the reverse order of removal.

2008 - MX-5 - Body and Accessories

KEY REMINDER SWITCH INSPECTION [EXCEPT ADVANCED KEYLESS SYSTEM]

1. Verify that the continuity between the key reminder switch terminals is as indicated in the table.



- If not as indicated in the table, replace the key reminder switch.

○ — ○ : Continuity

Key position	Terminal	
	A	B
Key inserted	○ —	— ○
Key removed		

## 2008 - MX-5 - Engine

### DTC P0441 [LF]

DTC P0441	Evaporative emission control system incorrect purge flow
DETECTION CONDITION	<ul style="list-style-type: none"><li>PCM measures the purge line pressure, which is the vacuum when a following condition. If vacuum between charcoal canister and intake manifold does not reach the specified, PCM determines that the EVAP system has clogging.</li></ul> <p style="text-align: center;"><b>MONITORING CONDITION</b></p> <ul style="list-style-type: none"><li>Engine speed: <b>1,500—3,500 rpm</b></li><li>Throttle opening angle: <b>11—20 %</b></li><li>Vehicle speed: <b>69.5—136 km/h { 43.2—84.5 mph} [MT]/34.5—136 km/h { 21.4—84.5 mph} [AT]</b></li></ul> <p style="text-align: center;"><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>This is an intermittent monitor (Evaporative system).</li><li>The MIL illuminates if the PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li><li>DIAGNOSTIC MONITORING TEST RESULT is available.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Purge solenoid valve malfunction</li><li>Blockage in EVAP system</li><li>Charcoal canister malfunction</li><li>Catch tank malfunction</li><li>EVAP hose damaged or loose</li><li>EVAP pipe damaged</li><li>Evaporative emission system leak detection pump malfunction</li></ul>

- Fuel pump unit poor seal
- Leakage in EVAP system
- PCM malfunction

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b> <ul style="list-style-type: none"> <li>• Have the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Evaporative system related) been recorded?</li> </ul>	Yes Go to the next step.
		No Record FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED SERVICE BULLETINS AVAILABILITY</b> <ul style="list-style-type: none"> <li>• Verify related Service Bulletins availability.</li> <li>• Is any related Service Bulletins available?</li> </ul>	Yes Perform the repair or diagnosis according to the available Service Bulletins. <ul style="list-style-type: none"> <li>• If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>VERIFY RELATED PENDING CODE OR STORED DTCS</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off then to the ON position (Engine off).</li> <li>• Verify related pending code or stored DTCS.</li> <li>• Is DTC P0443 present?</li> </ul>	Yes Go to the appropriate DTC inspection.
		No Go to the next step.
4	<b>DETERMINE IF THERE IS BLOCKAGE</b> <ul style="list-style-type: none"> <li>• Clear the DTC using the M-MDS.</li> <li>• Then perform the KOER self-test.</li> <li>• Is DTC P0441 present?</li> </ul>	Yes Go to Step 6.
		No Go to the next step.
5	<b>INSPECT IF MALFUNCTION IS BLOCKAGE OR LEAKAGE IN PURGE SOLENOID VALVE</b> <b>NOTE:</b> <ul style="list-style-type: none"> <li>• Carefully handle the evaporative system when disconnecting and connecting hoses. Do not use any lubricant around the system. Foreign material can cause a system malfunction.</li> <li>• Remove the purge solenoid valve and cool it</li> </ul>	Yes Replace the purge solenoid valve. Then go to Step 12.
		No Go to Step 7.

	<p>down in a refrigerator for 1 hour.</p> <ul style="list-style-type: none"> <li>• Install the purge solenoid valve and perform the KOER self-test using the M-MDS.</li> <li>• Is DTC P0441 present?</li> </ul>		
6	<p><b>INSPECT FOR LOCATION OF BLOCKAGE</b></p> <ul style="list-style-type: none"> <li>• Apply vacuum to the following parts using a vacuum pump.</li> <li>• Verify that the system does not hold vacuum at the following locations: <ul style="list-style-type: none"> <li>▪ Hoses and pipes between intake manifold and charcoal canister</li> <li>▪ Catch tank</li> <li>▪ Charcoal canister</li> </ul> </li> <li>• Is there any blockage?</li> </ul>	<p>Yes Repair or replace the appropriate parts.</p> <p>Then go to Step 12.</p>	
		<p>No Replace the purge solenoid valve. Then go to Step 12.</p>	
7	<p><b>DETERMINE LEAKAGE EXISTENCE</b></p> <ul style="list-style-type: none"> <li>• Perform the evaporative system leak inspection.</li> <li>• Is DTC P0442 recorded?</li> </ul>	<p>Yes Go to the next step.</p>	
		<p>No Go to Step 12.</p>	
8	<p><b>INSPECT IF PURGE SOLENOID VALVE IS STUCK OPEN</b></p> <ul style="list-style-type: none"> <li>• Inspect whether the purge solenoid valve is stuck open.</li> </ul> <p>(See <b>PURGE SOLENOID VALVE INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>• Is the purge solenoid valve normal?</li> </ul>	<p>Yes Go to the next step.</p>	
		<p>No Replace the purge solenoid valve. Then go to Step 12.</p>	
9	<p><b>INSPECT FOR LOCATION OF LEAKAGE</b></p> <ul style="list-style-type: none"> <li>• Inspect the following for leakage using the evaporative leak detector. <ul style="list-style-type: none"> <li>▪ Between purge solenoid valve and check valve</li> <li>▪ Between check valve and charcoal canister</li> </ul> </li> <li>• Is there any leakage?</li> </ul>	<p>Yes Repair or replace the appropriate parts.</p> <p>Then go to Step 12.</p>	
		<p>No Go to the next step.</p>	
10	<p><b>INSPECT EVAP SYSTEM LEAK DETECTION PUMP</b></p> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• Be careful to not apply a shock to the evaporative system leak detection pump, otherwise the results of the leak inspection</li> </ul>	<p>Yes Go to the next step.</p>	
		<p>No Replace the evaporative system leak detection pump, then go to Step 13.</p>	

	<p>could be incorrect.</p> <ul style="list-style-type: none"> <li>• Connect all disconnected connectors and hoses.</li> <li>• Place a clamp on the evaporative system leak detection pump hose between the evaporative system leak detection pump and the air filter.</li> <li>• Perform the evaporative system leak inspection.</li> </ul> <p>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>• Is DTC P2404 recorded?</li> </ul>		
11	<b>INSPECT FUEL PUMP UNIT INSTALLATION</b> <ul style="list-style-type: none"> <li>• Remove the fuel tank.</li> <li>• Visually inspect for damage, insufficient sealing or a poorly installed pump unit.</li> <li>• Is it normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the fuel tank or sealing, then go to the next step.
12	<b>PERFORM KOER SELF-TEST TO DETERMINE OTHER RELATED MALFUNCTION OTHER THAN BLOCKAGE LOCATION</b> <b>NOTE:</b> <ul style="list-style-type: none"> <li>• Carefully handle the evaporative system when disconnecting and connecting hoses. Do not use any lubricant around the system. Foreign material can cause a system malfunction.</li> <li>• Connect all disconnected connectors and hoses.</li> <li>• Perform the KOER self-test using M-MDS.</li> <li>• Is DTC P0441 still recorded?</li> </ul>	Yes	Blockage still exists.  Locate blockage position and repair.  Then go to the next step.
		No	Go to the next step.
13	<b>PERFORM LEAK INSPECTION</b> <ul style="list-style-type: none"> <li>• Connect all disconnected connectors and hoses.</li> <li>• Perform the evaporative system leak inspection.</li> </ul> <p>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>• Does the test result fail (red light turns on)?</li> </ul>	Yes	Leakage still exists. Locate leak the point and repair.  Then go to the next step.
		No	Go to the next step.
14	<b>VERIFY TROUBLESHOOTING OF DTC P0441 COMPLETED</b> <ul style="list-style-type: none"> <li>• Start the engine and let it idle.</li> </ul>	Yes	Replace the PCM, then go to the next step.



	<ul style="list-style-type: none"> <li>• Clear the DTC using the M-MDS.</li> <li>• Turn the ignition switch off.</li> <li>• Perform the “EVAP System Repair Verification Drive Mode”.</li> </ul> <p>(See <b>OBD-II DRIVE MODE [LF]</b>.)</p> <ul style="list-style-type: none"> <li>• Is the PENDING CODE for this DTC present?</li> </ul>	No	Go to the next step.
15	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform the “AFTER REPAIR PROCEDURE”.</li> </ul> <p>(See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</p> <ul style="list-style-type: none"> <li>• Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.

## 2008 - MX-5 - Engine

### DTC P050B [LF]

DTC P050B	Cold start ignition timing performance
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors actual ignition timing using the CKP sensor while electronic spark advance control fast idle correction operating. If the ignition timing is out of specified range, the PCM determines that the ignition timing at cold condition has performance problem.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is an intermittent monitor (Cold start reduction strategy monitoring).</li> <li>MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Electronic throttle control system malfunction</li> <li>Throttle valve stuck or blockage</li> <li>Air suction in intake air system</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (CCM related) been recorded?</li> </ul>	No Record the freeze frame data and diagnostic monitoring test results on the repair order, then go to the next step.
	<b>VERIFY RELATED REPAIR INFORMATION</b>	

2	<b>AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> <ul style="list-style-type: none"> <li>Is P050B on FREEZE FRAME DATA?</li> </ul>	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on freeze frame data. (See <a href="#">DTC TABLE[LF]</a> .)
4	<b>VISUALLY INSPECT CKP SENSOR AND PULSE WHEEL</b> <ul style="list-style-type: none"> <li>Visually inspect for CKP sensor and pulse wheel.</li> <li>Is there any damage or chip on CKP sensor and pulse wheel?</li> </ul>	Yes	Replace the suspected part, then go to Step 8.
		No	Go to the next step.
5	<b>INSPECT CKP SENSOR</b> <ul style="list-style-type: none"> <li>Inspect CKP sensor.</li> </ul> (See <a href="#">CRANKSHAFT POSITION (CKP) SENSOR INSPECTION[LF]</a> .) <ul style="list-style-type: none"> <li>Is the CKP sensor normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the CKP sensor, then go to Step 8.
6	<b>VISUALLY INSPECT CMP SENSOR AND PULSE WHEEL</b> <ul style="list-style-type: none"> <li>Visually inspect for CMP sensor and pulse wheel.</li> <li>Is there any damage or chip on CMP sensor and pulse wheel?</li> </ul>	Yes	Replace the suspected part, then go to Step 8.
		No	Go to the next step.
7	<b>INSPECT CMP SENSOR</b> <ul style="list-style-type: none"> <li>Inspect CMP sensor.</li> </ul> (See <a href="#">CAMSHAFT POSITION (CMP) SENSOR INSPECTION[LF]</a> .) <ul style="list-style-type: none"> <li>Is the CMP sensor normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the CMP sensor, then go to the next step.
8	<b>VERIFY TROUBLESHOOTING OF DTC P050B COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear DTC from the PCM memory using the M-MDS.</li> </ul>	Yes	Replace the PCM, then go to the next step. (See <a href="#">PCM REMOVAL/INSTALLATION[LF]</a> .)
		No	Go to the next step.

	<ul style="list-style-type: none"><li>• Perform the KOER self-test using the M-MDS.  (See <a href="#">DTC TABLE[LF]</a>.)</li><li>• Is the PENDING CODE for this DTC present?</li></ul>		
9	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the “after repair procedure”.  (See <a href="#">AFTER REPAIR PROCEDURE[LF]</a>.)</li><li>• Are any DTC present?</li></ul>	Yes	Go to the applicable DTC troubleshooting.  (See <a href="#">DTC TABLE[LF]</a> .)
		No	Troubleshooting completed.

## 2008 - MX-5 - Engine

### DTC P050A [LF]

DTC P050A	Cold start idle air control system performance
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>Actual Idle speed is lower than expected by <b>100 rpm</b> for <b>8.4 s</b> when the target idle speed correction value for cold start is <b>above 0 rpm</b> or ignition retard value is <b>above 10 ° CA</b>.</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>If atmospheric pressure is <b>less than 72.3 kPa {542 mmHg, 21.3 inHg}</b> or intake air temperature is <b>below -10 °C {14 °F}</b>, the PCM cancels diagnosis of P050A.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is an intermittent monitor (Cold start reduction strategy monitoring).</li> <li>MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Electronic throttle control system malfunction</li> <li>Throttle valve stuck or blockage</li> <li>Air suction in intake air system</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION		ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Have FREEZE FRAME DATA and</li> </ul>	Yes	Go to the next step.
		No	Record the freeze frame data and diagnostic monitoring test results on the repair order,

	DIAGNOSTIC MONITORING TEST RESULTS (CCM related) been recorded?		then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> <ul style="list-style-type: none"> <li>Is P050A on FREEZE FRAME DATA?</li> </ul>	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on freeze frame data.  (See <b>DTC TABLE[LF]</b> .)
4	<b>CHECK AIR SUCTION IN INTAKE AIR SYSTEM</b> <ul style="list-style-type: none"> <li>Start the engine.</li> <li>Check air suction between MAF sensor and intake manifold.</li> <li>Is there any air suction in the intake air system?</li> </ul>	Yes	Repair or replace malfunctioning part, then go to Step 7.
		No	Go to the next step.
5	<b>VERIFY ELECTRONIC THROTTLE CONTROL SYSTEM OPERATION</b> <ul style="list-style-type: none"> <li>Perform the Electronic Throttle Control System Operation Inspection.  (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b>.)</li> <li>Does the electronic throttle control system operate properly?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace malfunctioning part according to inspection result.  Then go to Step 7.
6	<b>VERIFY THROTTLE VALVE</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to off.</li> <li>Remove the throttle valve with connector connected.</li> <li>Access ETC_DSD PID using the M-MDS.</li> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Move the throttle valve using the ETC_DSD PID simulation function.</li> </ul>	Yes	Go to the next step.
		No	Clean the throttle valve and retest.  If the problem does not resolve, replace the throttle body.  Then go to the next step.

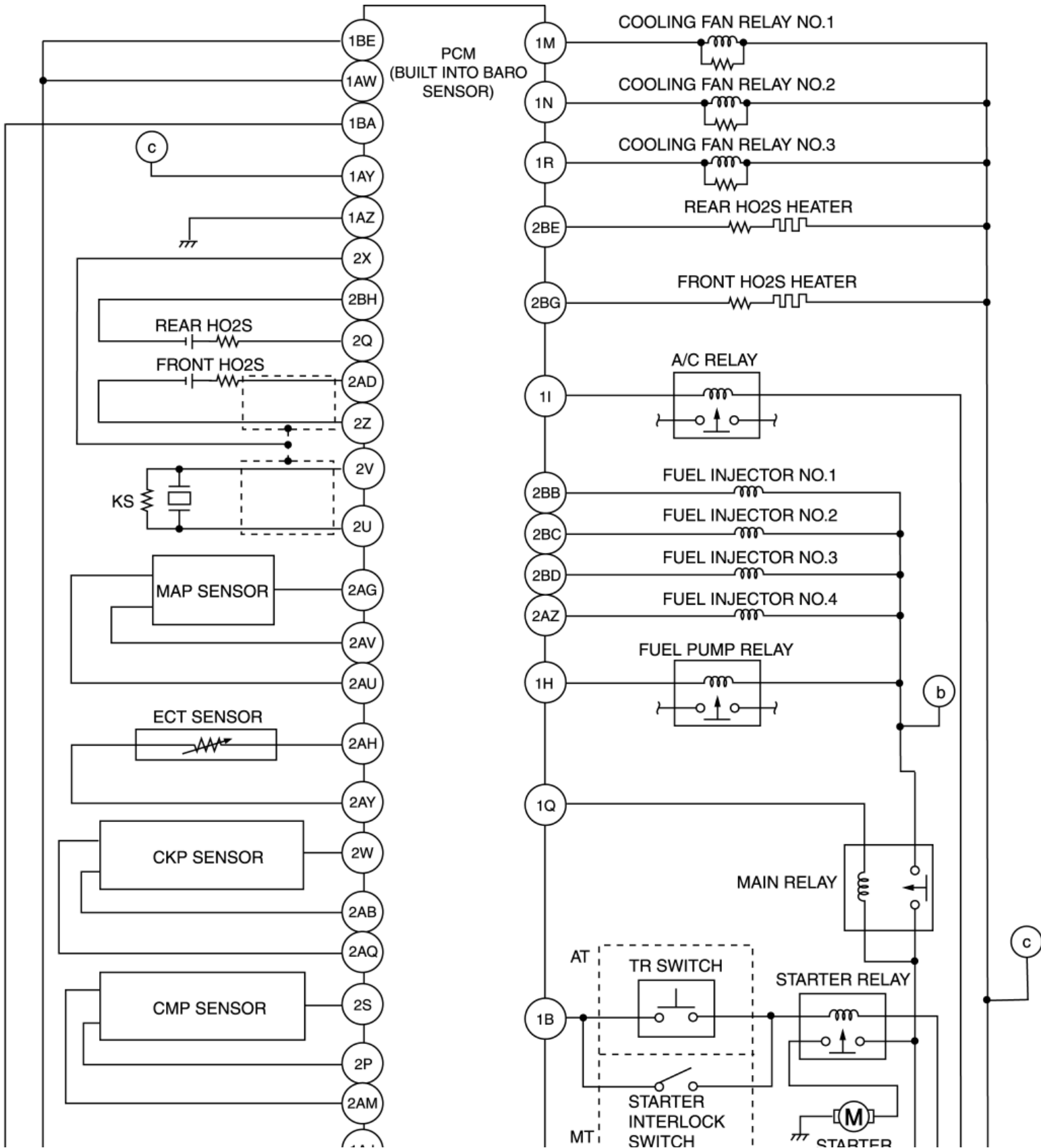
	<ul style="list-style-type: none"> <li>• Dose the throttle valve move smoothly?</li> </ul>		
7	<b>VERIFY TROUBLESHOOTING OF DTC P050A COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Clear DTC from the PCM memory using the M-MDS.</li> <li>• Perform the KOER self-test using the M-MDS.</li> </ul> <p>(See <b>DTC TABLE[LF]</b>.)</p> <ul style="list-style-type: none"> <li>• Is the PENDING CODE for this DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step. (See <b>PCM REMOVAL/INSTALLATION[LF]</b> .)
		No	Go to the next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform the “after repair procedure”.</li> </ul> <p>(See <b>AFTER REPAIR PROCEDURE[LF]</b>.)</p> <ul style="list-style-type: none"> <li>• Are any DTC present?</li> </ul>	Yes	Go to the applicable DTC troubleshooting. (See <b>DTC TABLE[LF]</b> .)
		No	Troubleshooting completed.

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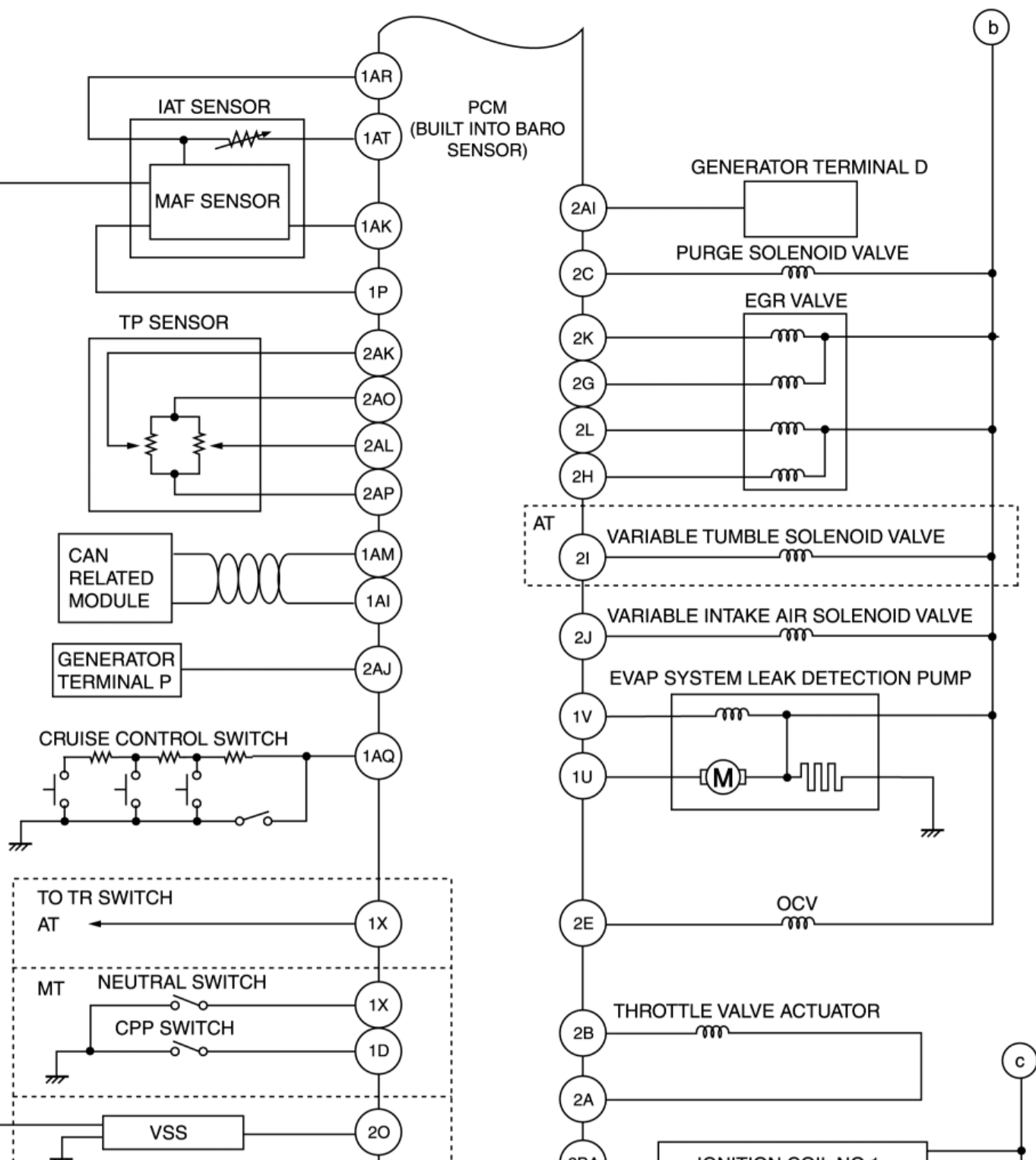
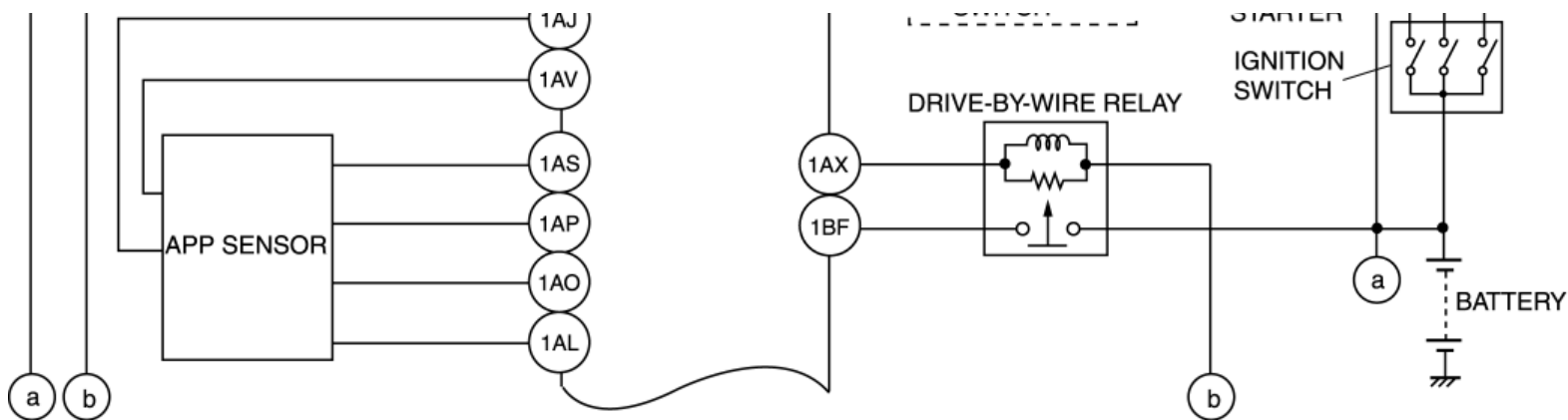
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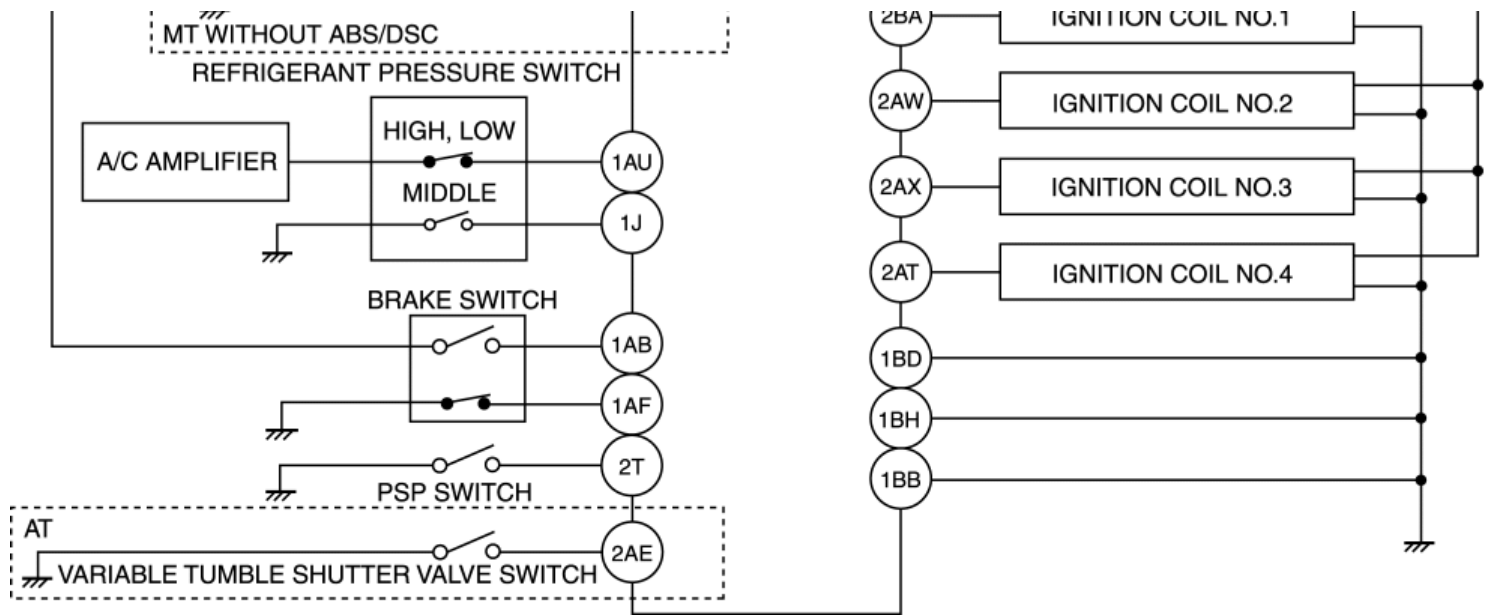
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ON-BOARD DIAGNOSTIC WIRING DIAGRAM [LF]









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## 2008 - MX-5 - Engine

### MONITORING SYSTEM AND CONTROL SYSTEM DEVICE RELATIONSHIP CHART [LF]

x: Applicable

Component	HO2S	HO2S heater monitor	Catalyst monitor	Misfire monitor	Fuel system monitor	Evaporative emission system monitor	EGR system monitor	Engine cooling system
<b>Input</b>								
Battery		x		x		x		
Ignition switch	x	x				x		
A/C switch, refrigerant pressure switch (high, low pressure)							x	x
TP sensor	x		x	x	x	x	x	
ECT sensor	x	x	x	x	x	x	x	x
IAT sensor	x		x		x	x	x	x
MAF sensor	x	x	x	x	x		x	x
Front HO2S	x	x	x		x			
Rear HO2S	x	x			x			
Fuel gauge sender unit						x		

BARO sensor	x					x		
MAP sensor							x	
CMP sensor				x				
CKP sensor	x	x	x	x	x	x	x	x
VSS	x					x	x	x
<b>Output</b>								
Fuel injector					x			
Front HO2S heater		x						
Rear HO2S heater		x						
EGR valve							x	
Purge solenoid valve	x		x		x	x		
EVAP system leak detection pump						x		
MIL	x	x	x	x	x	x	x	x
DLC-2	x	x	x	x	x	x	x	x

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### OBD-II PENDING TROUBLE CODE [LF]

- These appear when a problem is detected in a monitored system. The code for a failed system is stored in the PCM memory in the first drive cycle. This code is called the pending code. If the PCM judges that the system returned to normal or the problem was mistakenly detected, and deletes the pending code. If the problem is found in a second drive cycle too, the PCM judges that the system has failed, and the DTC is stored.

## 2008 - MX-5 - Engine

### OBD-II FREEZE FRAME DATA [LF]

- This is the technical data which indicates the engine condition at the time of the first malfunction. This data will remain in the memory even if another emission-related DTC is stored, with the exception of Fuel system or Misfire DTCs. Once freeze frame data for Fuel system or Misfire DTC is stored, it will overwrite any previous data and the freeze frame will not be overwritten again.

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### OBD-II ON-BOARD SYSTEM READINESS TEST [LF]

- This shows the OBD systems operating status. If any monitor function is incomplete, M-MDS will identify which monitor function has not been completed. The Fuel system, Misfire and CCM are continuous monitoring-type functions. The HO2S, EGR system and Catalyst will be monitored under drive cycles. The OBD diagnostic system is initialized by performing the DTC cancellation procedure or disconnecting the negative battery cable.

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### OBD-II READ/CLEAR DIAGNOSTIC TEST RESULTS [LF]

- This retrieves all stored DTCs in the PCM and clears the on-board readiness test results, freeze frame data, DTC and pending trouble code.

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### OBD-II PARAMETER IDENTIFICATION (PID) ACCESS [LF]

- The PID mode allows access to certain data values, analog and digital inputs and outputs, calculated values and system status information. Since the PID values for output devices are the PCM internal data values, inspect each device to identify which output devices are malfunctioning.

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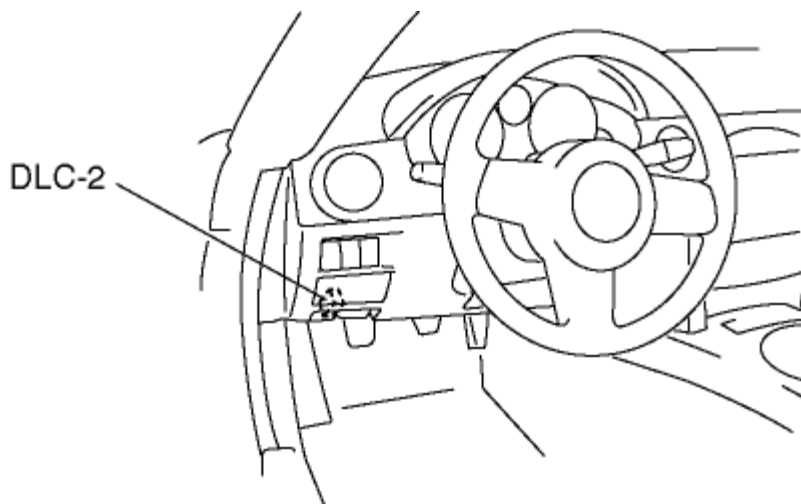
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### ON-BOARD DIAGNOSTIC TEST [LF]

#### DTC Reading Procedure

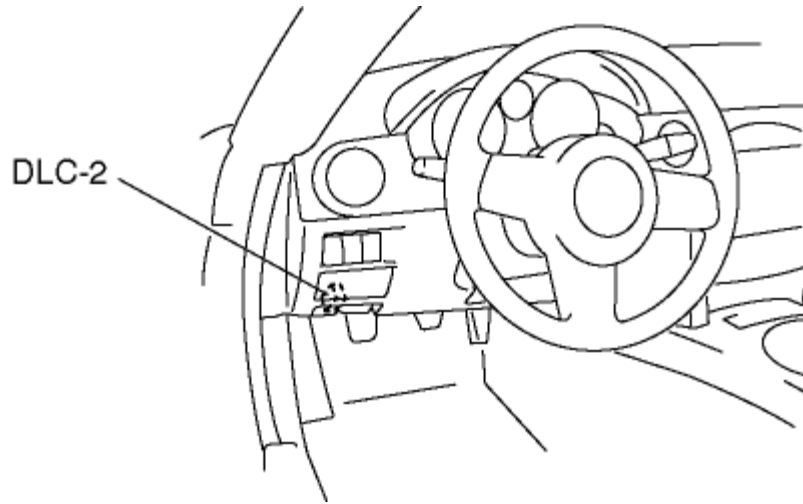
1. Connect the M-MDS to the DLC 2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.
  - When using the IDS (laptop PC)
    - Select "Self Test".
    - Select "Modules".
    - Select "PCM".
  - When using the PDS (Pocket PC)
    - Select "Module Tests".
    - Select "PCM".
    - Select "Self Test".
3. Select the "Retrieve CMDTCs" and perform procedures according to directions on the M-MDS screen.
4. Verify the DTC according to the directions on the M-MDS screen.
  - If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.
5. After completion of repairs, clear all DTCs stored in the PCM, while referring to "AFTER

### Pending Trouble Code Access Procedure

1. Connect the M-MDS to the DLC 2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

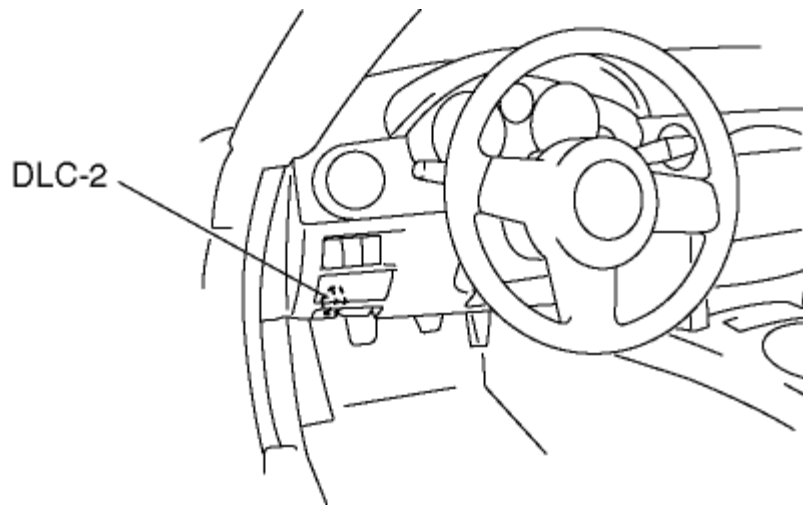
- When using the IDS (laptop PC)
  - Select "Self Test".
  - Select "Modules".
  - Select "PCM".
- When using the PDS (Pocket PC)
  - Select "Module Tests".
  - Select "PCM".
  - Select "Self Test".

3. Then, select the "Retrieve CMDTCs" and perform procedures according to directions on the M-MDS screen.

4. Retrieve the pending trouble codes according to the directions on the M-MDS screen.

### Freeze Frame PID Data Access Procedure

1. Connect the M-MDS to the DLC 2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

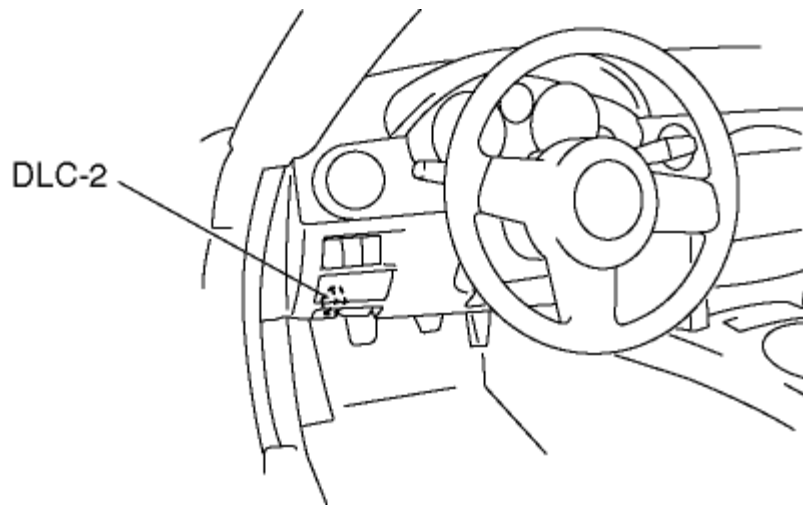
- When using the IDS (laptop PC)
  - Select "Self Test".
  - Select "Modules".
  - Select "PCM".
- When using the PDS (Pocket PC)
  - Select "Module Tests".
  - Select "PCM".
  - Select "Self Test".

3. Then, select the "Retrieve CMDTCs" and perform procedures according to directions on the M-MDS screen.

4. Retrieve the freeze frame PID data according to the directions on the M-MDS screen.

### **On-Board System Readiness Tests Access Procedure**

1. Connect the M-MDS to the DLC 2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  - Select "Powertrain".
  - Select "OBD Test Modes".
  - Select "Mode 1 Powertrain Data".
  - Select "PCM".
- When using the PDS (Pocket PC)
  - Select "OBDII Modes".
  - Select "Mode 1 Powertrain Data".
  - Select "PCM".

3. Then, select the "\*\*\*SUP" and "\*\*\*EVAL" PIDs in the PID selection screen.

4. Monitor those PIDs and check if system monitor is completed.

#### **NOTE:**

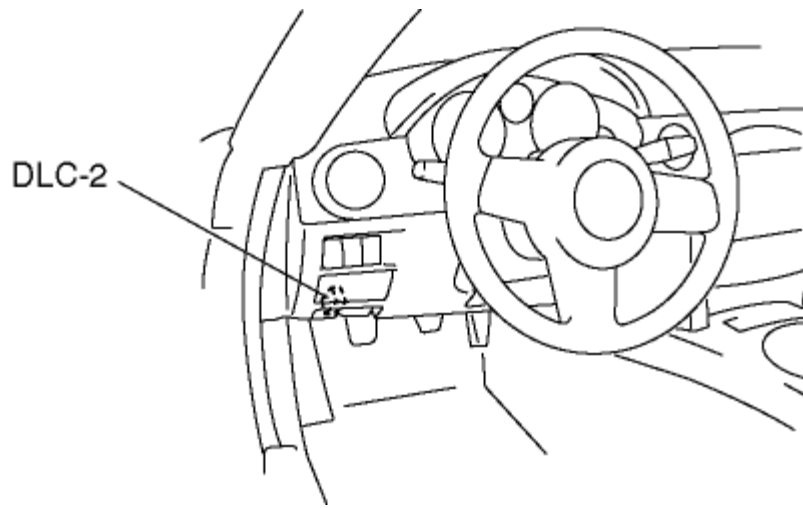
- If the on-board system readiness tests are not completed the PCM stores DTC P1000.

### **PID/DATA Monitor and Record Procedure**

#### **NOTE:**

- The PID data screen function is used for monitoring the calculated value of input/output signals in the module. Therefore, if the monitored value of the output parts is not within the specification, it is necessary to inspect the monitored value of input parts corresponding to the applicable output part control. In addition, because the system does not display an output part malfunction as an abnormality in the monitored value, it is necessary to inspect the output parts individually.

1. Connect the M-MDS to the DLC 2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

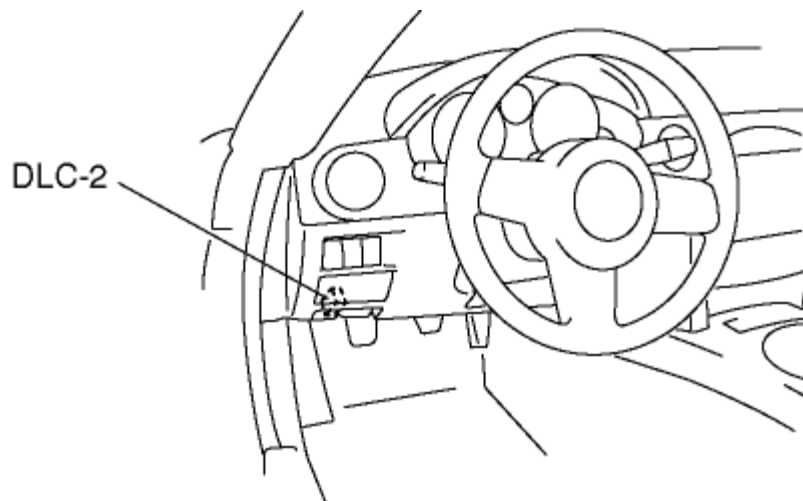
- When using the IDS (laptop PC)
  - Select "DataLogger".
  - Select "Modules".
  - Select "PCM".
- When using the PDS (Pocket PC)
  - Select "Module Tests".
  - Select "PCM".
  - Select "DataLogger".

3. Select the applicable PID from the PID table.

4. Verify the PID data according to the detections on the screen.

### **Diagnostic Monitoring Test Results Access Procedure**

1. Connect the M-MDS to the DLC 2.



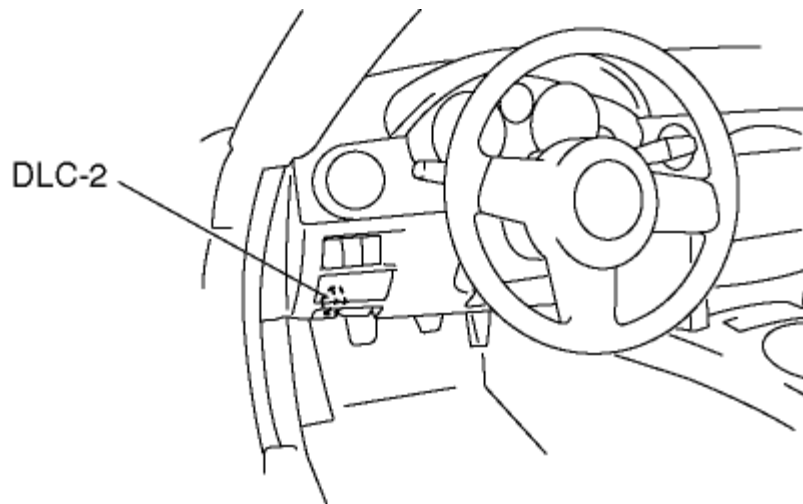
2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  - Select "Powertrain".
  - Select "OBD Test Modes".
  - Select "Mode 6 On-Board Test Results".
- When using the PDS (Pocket PC)
  - Select "OBDII Modes".
  - Select "Mode 6 On-Board Test Results".

3. Verify the diagnostic monitoring test result according to the directions on the screen.

### Active Command Modes Procedure

1. Connect the M-MDS to the DLC 2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  - Select "DataLogger".
  - Select "Modules".
  - Select "PCM".
- When using the PDS (Pocket PC)
  - Select "Module Tests".
  - Select "PCM".
  - Select "DataLogger".

3. Select the simulation items from the PID table.

4. Perform the simulation function, inspect the operations for each parts.

- If the operation of output parts cannot be verified after the active command mode inspection is performed, this could indicate the possibility of an open or short circuit, sticking, or operation malfunction in the output parts.

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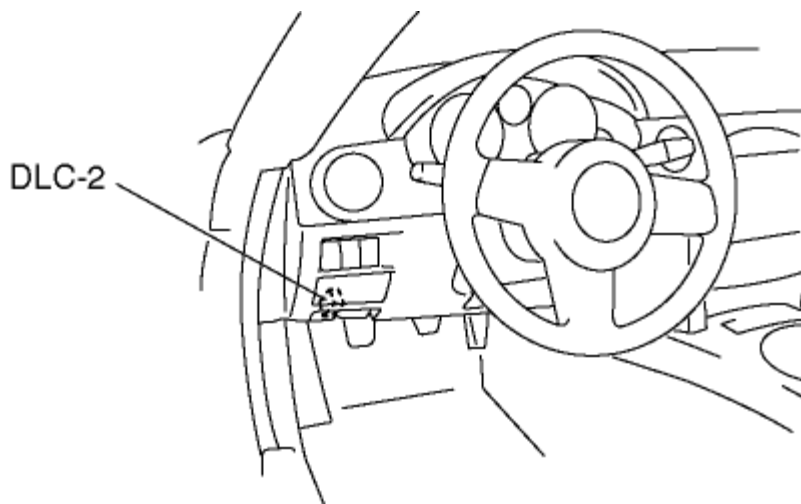
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### AFTER REPAIR PROCEDURE [LF]

1. Connect the M-MDS to the DLC 2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  - Select "Self Test".
  - Select "Modules".
  - Select "PCM".
  - Select "Retrieve CMDTCs".
- When using the PDS (Pocket PC)
  - Select "Module Tests".
  - Select "PCM".
  - Select "Self Test".
  - Select "Retrieve CMDTCs".

3. Verify the DTC according to the directions on the M-MDS screen.
4. Press the clear button on the DTC screen to clear the DTC.
5. Verify that no DTCs are displayed.



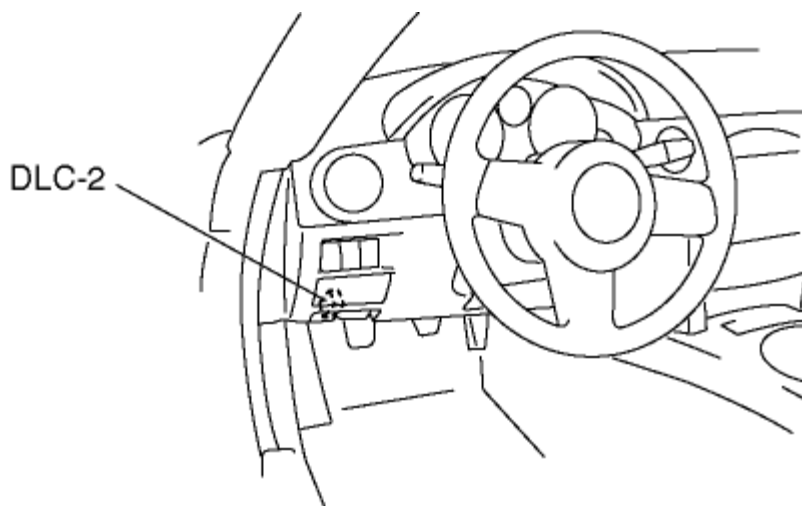
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### KOEO/KOER SELF TEST [LF]

#### NOTE:

- Perform a KOER self test while idling.

1. Connect the M-MDS to the DLC 2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  - Select "Self Test".
  - Select "Modules".
  - Select "PCM".
- When using the PDS (Pocket PC)
  - Select "Module Tests".
  - Select "PCM".
  - Select "Self Test".

3. Then, select the "KOEO On Demand Self Test" or "KOER On Demand Self Test" and perform procedures according to directions on the M-MDS screen.

4. Verify the DTC according to the directions on the M-MDS screen.

- If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.

5. After completion of repairs, clear all DTCs stored in the PCM, while referring to "AFTER REPAIR PROCEDURE".



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### OBD-II DRIVE MODE [LF]

- Using the OBD-II drive mode, the monitoring item requested by OBD-II regulations can be easily diagnosed.
- Performing the Drive Mode inspects the OBD-II system for proper operation and must be performed to ensure that no additional DTCs are present.
- The OBD-II drive mode is divided into the specific drive mode and single drive mode.
- For the specific drive mode, specified drive modes have been set for each individual monitoring item requested by OBD-II regulations, and they can be diagnosed individually. For the single drive mode, the entire monitoring item requested by OBD-II regulations can be diagnosed.
- The following modes are in the specific drive mode. The applicable system is diagnosed by driving in the following drive modes.
  - Mode 01 (PCM Adaptive Memory Produce Drive Mode)
  - Mode 02 (EGR System Repair Verification Drive Mode)
  - Mode 03 (HO2S heater, HO2S, and TWC Repair Verification Drive Mode)
  - Mode 06 (EVAP System Repair Verification Drive Mode)
- The following systems are diagnosed with the single drive mode.
  - EGR system
  - Oxygen sensor (HO2S)
  - Oxygen sensor heater
  - Catalytic converter (TWC)
  - Evaporative (EVAP) system

#### CAUTION:

- While performing the Drive Mode, always operate the vehicle in a safe and lawful manner.
- When the M-MDS is used to observe monitor system status while driving, be sure to have another technician with you, or record the data in the M-MDS using the PID/DATA MONITOR AND RECORD function and inspect later.

#### NOTE:

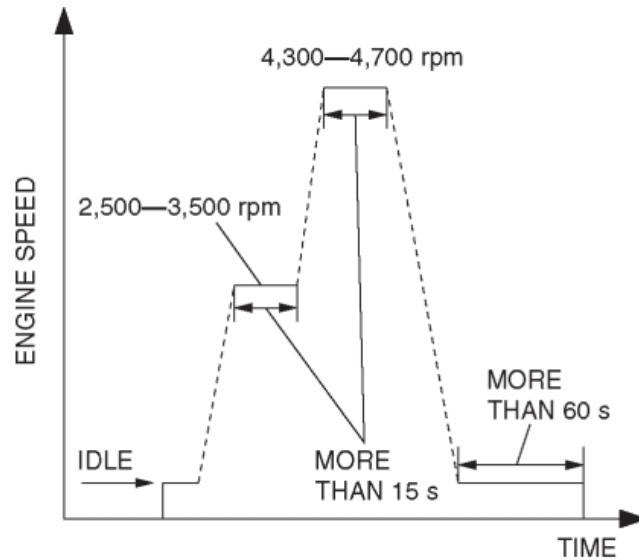
- Vehicle speed and engine speed detected by the PCM may differ from that indicated by the speedometer and tachometer. Use the M-MDS to monitor vehicle speed.
- If the OBD-II system inspection is not completed during the Drive Mode, the following causes are considered:
  - The OBD-II system detects the malfunction.
  - The Drive Mode procedure is not completed correctly.
- Disconnecting the battery will reset the memory. Do not disconnect the battery during and after Drive Mode.
- The M-MDS can be used at anytime through the course of the Drive Mode to monitor the completion status. Monitoring can be done by viewing the ON BOARD SYSTEM READINESS menu.
- The OBD monitoring status can be confirmed with the ignition switch operation. During KOEO, the MIL illuminates for a fail-light inspection for **approx. 17 s**. The OBD monitoring status is confirmed after the fail-light inspection.
  - If all of the diagnosis is completed even one time, the MIL will continue to illuminate.
  - If all of the diagnosis is not completed, the MIL flashes for **approx. 7 s**, and then it illuminates until the engine is started.

#### Mode 01 (PCM Adaptive Memory Production Drive Mode)

1. Start the engine and warm it up completely.
2. Verify the following conditions and correct if necessary:

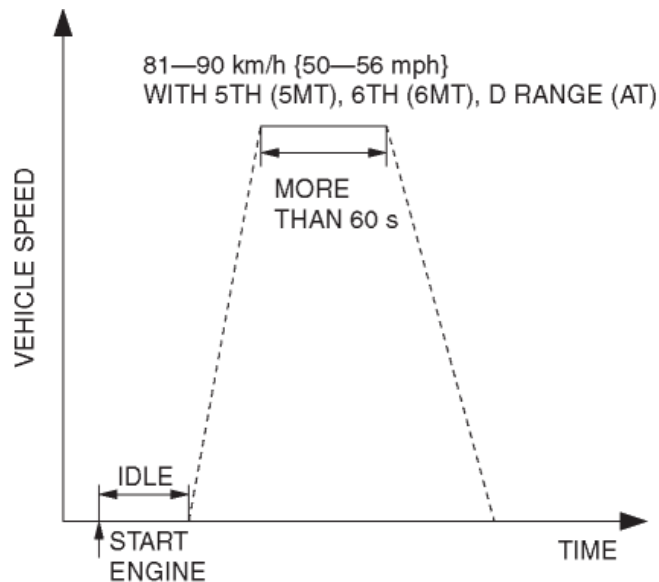
- All accessory loads (A/C, headlights, blower fan, rear window defroster) are off.

3. Perform no load racing at the engine speed shown in the graph, then idle the engine for more than **60 s** after the cooling fan has stopped. If possible, monitor RPM PID for engine speed during this procedure.



#### Mode 02 (EGR System Repair Verification Drive Mode)

1. Perform "PCM Adaptive Memory Production Drive Mode" first.
2. Verify all accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
3. Drive the vehicle as shown in the graph.



4. Stop the vehicle and access ON BOARD SYSTEM READINESS menu of GENERIC OBD-II FUNCTION to verify the OBD monitoring status.

- If completed, the OBD monitoring status items change from non-completed to completed.
- If not completed, turn the ignition switch off then repeat from Step 3.

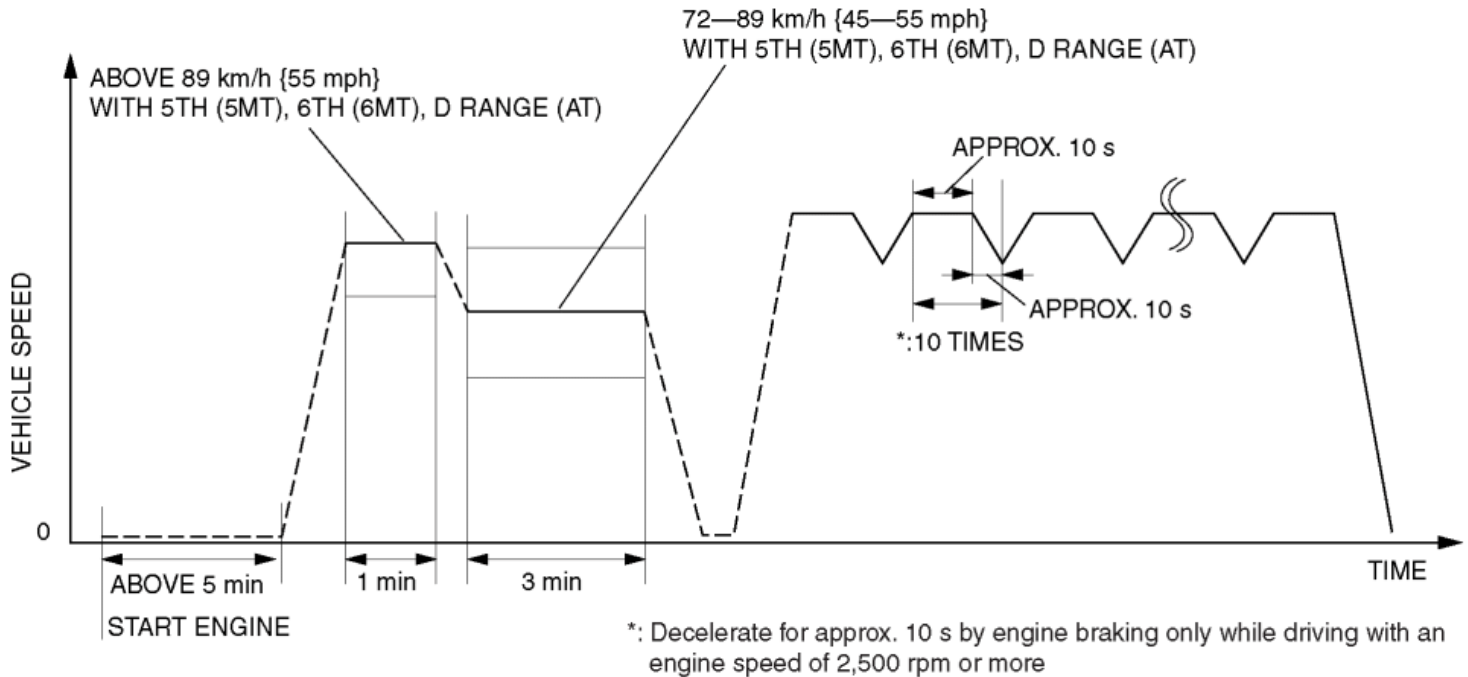
5. Access DIAGNOSTIC MONITORING TEST RESULTS menu of GENERIC OBD-II FUNCTIONS to verify the monitor results.

- If detected values are not within specification, repair has not been completed.

6. Verify no DTCs are available.

#### Mode 03 (HO2S heater, HO2S, and TWC Repair Verification Drive Mode)

1. Perform "PCM Adaptive Memory Production Drive Mode" first.
2. Verify all accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
3. Drive the vehicle as shown in the graph. The driving conditions before driving at constant speed are not specified.



4. Stop the vehicle and access ON BOARD SYSTEM READINESS menu of GENERIC OBD-II FUNCTION to verify the OBD monitoring status.
  - If completed, the OBD monitoring status items change from non-completed to completed.
  - If not completed, turn the Ignition switch off then repeat from Step 3.
5. Access DIAGNOSTIC MONITORING TEST RESULTS menu of GENERIC OBD-II FUNCTIONS to verify the monitor results.
  - If detected values are not within the specification, repair has not been completed.
6. Verify no DTCs are available.

#### Mode 06 (EVAP System Repair Verification Drive Mode)

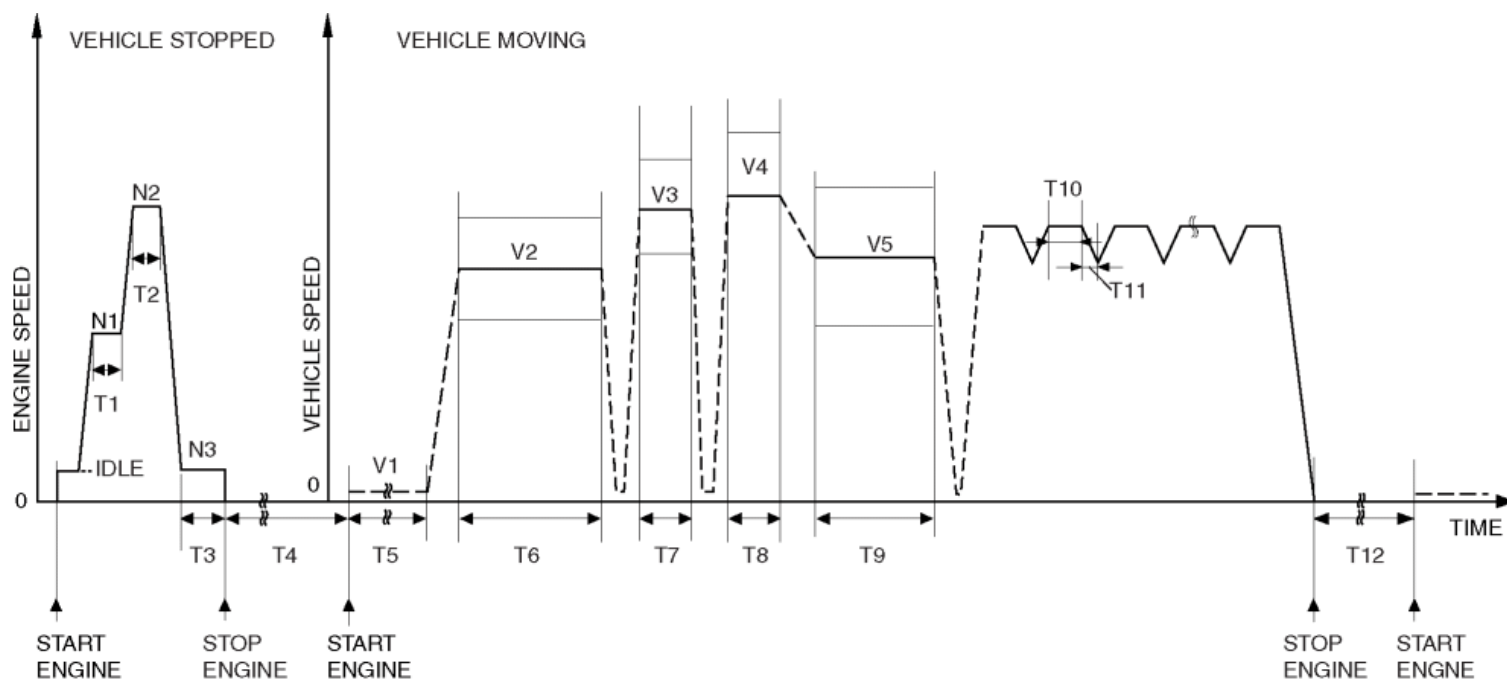
##### NOTE:

- If "EVAP System Repair Verification Drive Mode" cannot be performed (it is impossible to drive the vehicle under this drive mode condition), perform evaporative system test procedure as an alternative. (See [ENGINE CONTROL SYSTEM OPERATION INSPECTION \[LF\]](#).)
1. Verify that all of the following PIDs are within the following specifications. All PIDs must be within specifications before engine is started to initiate the evaporative system test.
    - BARO: **above 72.2 kPa {542 mmHg, 21.3 inHg}**
    - IAT: **5—35 °C {41—95 °F}**
    - FTL: **15—85%**
    - VPWR: **above 10.9 V**
  2. Clear DTC from PCM memory using M-MDS.
  3. Start the engine and idle it for **more than 10 s**, then turn the ignition switch off.
  4. Leave vehicle for **5 hours or more**.
  5. Start the engine and idle for **more than 5 min**.
  6. Drive the vehicle at an engine speed of **65—80 km/h {40—50 mph}** for **more than 5 min**.
  7. Stop the vehicle and turn the ignition switch off.
  8. Leave vehicle as it is for **5.5 hours or more**.

9. Start the engine.
10. Access the ON BOARD SYSTEM READINESS to verify the OBD monitoring status.
  - If completed, the OBD monitoring status items change from non-completed to completed.
  - If not completed, turn the ignition switch off then go back to Step 1.
11. Access the DIAGNOSTIC MONITORING TEST RESULTS to verify the monitor results.
  - If detected values are not within specification, repair has not completed.
12. Verify no DTCs are available.

### Single Drive Mode

1. Start the engine and warm it up completely.
2. Clear the DTC from the PCM memory using the M-MDS.
3. Verify the following conditions and correct if necessary:
  - All accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
4. Verify that all of the following PIDs are within the following specifications. All PIDs must be within specifications from Step 5 to Step 6.
  - BARO: **above 72.2 kPa {542 mmHg, 21.3 inHg}**
  - IAT: **5—35 °C {41—95 °F}**
  - FTL: **15—85%**
  - VPWR: **above 10.9 V**
5. With the vehicle stopped, race the engine at the engine speed indicated, and then drive the vehicle as shown in the graph. The driving conditions before driving at constant speed are not specified. If possible, monitor RPM PID for engine speed during this procedure.



Step	Time	Engine speed (rpm)	Vehicle speed (km/h {mph})	Vehicle condition
1	T1: More than 15 s	N1 : 2,500—3,500	0 {0}	—
2	T2: More than 15 s	N2 : 4,000—5,000	0 {0}	—



3	T3:	More than 60 s	N3 : Idle	0 {0}	Idle the engine after the cooling fan has stopped
4	T4:	More than 5 h	0	0 {0}	Keep the ignition switch off
5	T5:	More than 5 min	Idle	V1 : 0 {0}	—
6	T6:	5 min	—	V2 : 65—80 {40—50}	—
7	T7:	1 min	—	V3 : 81—90 {50—56}	5MT: 5TH 6MT: 6TH AT: D range
8	T8:	1 min	—	V4 : Above 89 {55}	5MT: 5TH 6MT: 6TH AT: D range
9	T9:	3 min	—	V5 : 72—89 {45—55}	5MT: 5TH 6MT: 6TH AT: D range
10	T10:	Approx. 10 s	Above 2,500	—	—
11	T11:	Approx. 10 s	—	—	Decelerate by engine braking only (10 times)
12	T12:	More than 5.5h	0	0 {0}	Keep the ignition switch off

6. Turn the ignition switch off.

7. Access the ON BOARD SYSTEM READINESS to verify the OBD monitoring status.

- If completed, all of the OBD monitoring status items change from non-completed to completed.
- If not completed, turn the ignition switch off, then perform the applicable specific drive mode for any monitoring item that was not in the detection condition.

8. Access the DIAGNOSTIC MONITORING TEST RESULTS to verify the monitor results.

- If detected values are not within specification, repair has not been completed.

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### DIAGNOSTIC MONITORING TEST RESULTS [LF]

- The purpose of this test mode is to confirm the result of OBD-II monitor diagnostic test results. The result values stored when particular monitor is completed are displayed. If the monitor is not completed, initial value is displayed.

OBD Monitor ID	Test ID	Description	Related system	Scaling ID	Unit
01	80	HO2S (Front) lean-to-rich response time (calculated)	HO2S	20	Ratio
01	81	HO2S (Front) rich-to-lean response time (calculated)		20	Ratio
01	82	HO2S (Front) lean-to-rich response time (calculated)		20	Ratio
01	83	HO2S (Front) rich-to-lean response time (calculated)		20	Ratio
02	03	Low HO2S (Rear) voltage for switch time calculation (constant)		0A	Voltage
02	04	High HO2S (Rear) voltage for switch time calculation (constant)		0A	Voltage
02	05	HO2S (Rear) rich-to-lean response time (calculated)		10	Time
21	80	HO2S (Front) and HO2S (Rear) switching time ratio	Catalyst	20	Ratio
31	83	EGR pressure variation	EGR	17	Pressure
3A	80	EVAP system leak detection pump large leak check	EVAP	0D	Current
3B	80	EVAP system leak detection pump small leak check		0D	Current
3C	80*1	EVAP system leak detection pump very small leak check		05	Raw value
3D	80	Purge flow monitor		0D	Current

A2	OB	Cylinder No.1 average misfire counts for last 10 DC	Misfire	24	Counts
A2	OC	Cylinder No.1 misfire counts for last/current DC		24	Counts
A3	OB	Cylinder No.2 average misfire counts for last 10 DC		24	Counts
A3	OC	Cylinder No.2 misfire counts for last/current DC		24	Counts
A4	OB	Cylinder No.3 average misfire counts for last 10 DC		24	Counts
A4	OC	Cylinder No.3 misfire counts for last/current DC		24	Counts
A5	OB	Cylinder No.4 average misfire counts for last 10 DC		24	Counts
A5	OC	Cylinder No.4 misfire counts for last/current DC		24	Counts

\*1

California emission regulation applicable model

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### DTC TABLE [LF]

×: Applicable—: Not applicable

DTC No.	Condition	MIL	DC	Monitor item	Self-test type*1	Memory function	Page
B1342	PCM malfunction	OFF	—	—	C, O	—	(See <a href="#">DTC B1342 [LF]</a> .)
P0011	CMP timing over-advanced	ON	1	CCM	C, R	×	(See <a href="#">DTC P0011 [LF]</a> .)
P0012	CMP timing over-retarded	ON	2	CCM	C, R	×	(See <a href="#">DTC P0012 [LF]</a> .)
P0016	CKP-CMP correlation	ON	2	CCM	C	×	(See <a href="#">DTC P0016 [LF]</a> .)
P0030	Front HO2S heater control circuit problem	ON	2	HO2S heater	C, O, R	×	(See <a href="#">DTC P0030 [LF]</a> .)
P0031	Front HO2S heater circuit low input	ON	2	HO2S heater	C, O, R	×	(See <a href="#">DTC P0031 [LF]</a> .)
P0032	Front HO2S heater circuit high input	ON	2	HO2S heater	C, O, R	×	(See <a href="#">DTC P0032 [LF]</a> .)
P0037	Rear HO2S heater circuit low input	ON	2	HO2S heater	C, O, R	×	(See <a href="#">DTC P0037 [LF]</a> .)
P0038	Rear HO2S heater circuit high input	ON	2	HO2S heater	C, O, R	×	(See <a href="#">DTC P0038 [LF]</a> .)
P0069	Manifold absolute pressure/atmospheric pressure correlation	ON	2	CCM	C	×	(See <a href="#">DTC P0069 [LF]</a> .)
P0101	MAF sensor circuit range/performance problem	ON	2	CCM	C	×	(See <a href="#">DTC P0101 [LF]</a> .)

P0102	MAF sensor circuit low input	ON	1	CCM	C, O, R	×	(See <a href="#">DTC P0102 [LF]</a> .)
P0103	MAF sensor circuit high input	ON	1	CCM	C, O, R	×	(See <a href="#">DTC P0103 [LF]</a> .)
P0107	MAP sensor circuit low input	ON	1	CCM	C, O, R	×	(See <a href="#">DTC P0107 [LF]</a> .)
P0108	MAP sensor circuit high input	ON	1	CCM	C, O, R	×	(See <a href="#">DTC P0108 [LF]</a> .)
P0111	IAT sensor circuit range/performance problem	ON	2	CCM	C	×	(See <a href="#">DTC P0111 [LF]</a> .)
P0112	IAT sensor circuit low input	ON	1	CCM	C, O, R	×	(See <a href="#">DTC P0112 [LF]</a> .)
P0113	IAT sensor circuit high input	ON	1	CCM	C, O, R	×	(See <a href="#">DTC P0113 [LF]</a> .)
P0116	Engine coolant temperature circuit range/performance	ON	1	Engine cooling system	C	×	(See <a href="#">DTC P0116 [LF]</a> .)
P0117	ECT sensor circuit low input	ON	1	Engine cooling system	C, O, R	×	(See <a href="#">DTC P0117 [LF]</a> .)
P0118	ECT sensor circuit high input	ON	1	Engine cooling system	C, O, R	×	(See <a href="#">DTC P0118 [LF]</a> .)
P0122	TP sensor No.1 circuit low input	ON	1	CCM	C, O, R	×	(See <a href="#">DTC P0122 [LF]</a> .)
P0123	TP sensor No.1 circuit high input	ON	1	CCM	C, O, R	×	(See <a href="#">DTC P0123 [LF]</a> .)
P0125	Excessive time to enter closed loop fuel control	ON	2	Engine cooling system	C	×	(See <a href="#">DTC P0125 [LF]</a> .)
P0126	Coolant thermostat stuck open	ON	2	Engine cooling system	C	×	(See <a href="#">DTC P0126, P0128 [LF]</a> .)
P0128		ON	2	Engine cooling system	C	×	(See <a href="#">DTC P0126, P0128 [LF]</a> .)
P0130	Front HO2S circuit problem	ON	2	HO2S	C, O, R	×	(See <a href="#">DTC P0130 [LF]</a> .)

P0131	Front HO2S circuit low input	ON	2	HO2S	C, O, R	×	(See <a href="#">DTC P0131 [LF]</a> .)
P0132	Front HO2S circuit high input	ON	2	HO2S	C, O, R	×	(See <a href="#">DTC P0132 [LF]</a> .)
P0133	Front HO2S circuit problem	ON	2	HO2S	C	×	(See <a href="#">DTC P0133 [LF]</a> .)
P0134	Front HO2S no activity detected	ON	2	HO2S	C, R	×	(See <a href="#">DTC P0134 [LF]</a> .)
P0137	Rear HO2S circuit low input	ON	2	HO2S	C, O, R	×	(See <a href="#">DTC P0137 [LF]</a> .)
P0138	Rear HO2S circuit high input	ON	2	HO2S	C, O, R	×	(See <a href="#">DTC P0138 [LF]</a> .)
P0139	Rear HO2S circuit problem	ON	2	HO2S	C	×	(See <a href="#">DTC P0139 [LF]</a> .)
P0140	Rear HO2S no activity detected	ON	2	HO2S	C, R	×	(See <a href="#">DTC P0140 [LF]</a> .)
P0222	TP sensor No.2 circuit low input	ON	1	CCM	C, O, R	×	(See <a href="#">DTC P0222 [LF]</a> .)
P0223	TP sensor No.2 circuit high input	ON	1	CCM	C, O, R	×	(See <a href="#">DTC P0223 [LF]</a> .)
P0300	Random misfire detected	Flash/ON	1 or 2	Misfire	C, R	×	(See <a href="#">DTC P0300 [LF]</a> .)
P0301	Cylinder No.1 misfire detected	Flash/ON	1 or 2	Misfire	C, R	×	(See <a href="#">DTC P0301, P0302, P0303, P0304 [LF]</a> .)
P0302	Cylinder No.2 misfire detected	Flash/ON	1 or 2	Misfire	C, R	×	
P0303	Cylinder No.3 misfire detected	Flash/ON	1 or 2	Misfire	C, R	×	
P0304	Cylinder No.4 misfire detected	Flash/ON	1 or	Misfire	C, R	×	

			2				
P0327	KS circuit low input	ON	1	CCM	C, O, R	×	(See <a href="#">DTC P0327 [LF]</a> .)
P0328	KS circuit high input	ON	1	CCM	C, O, R	×	(See <a href="#">DTC P0328 [LF]</a> .)
P0335	CKP sensor circuit problem	ON	1	CCM	C	×	(See <a href="#">DTC P0335 [LF]</a> .)
P0340	CMP sensor circuit problem	ON	1	CCM	C	×	(See <a href="#">DTC P0340 [LF]</a> .)
P0401	EGR flow insufficient detected	ON	2	EGR system	C, R	×	(See <a href="#">DTC P0401 [LF]</a> .)
P0403	EGR valve (stepping motor) circuit problem	ON	2	CCM	C, O, R	×	(See <a href="#">DTC P0403 [LF]</a> .)
P0421	Warm up catalyst system efficiency below threshold	ON	2	Catalyst	C	×	(See <a href="#">DTC P0421 [LF]</a> .)
P0441	Evaporative emission control system incorrect purge flow	ON	2	Evaporative system	C, R	×	(See <a href="#">DTC P0441 [LF]</a> .)
P0442	Evaporative emission control system leak detected (small leak)	ON	2	Evaporative system	C, R	×	(See <a href="#">DTC P0442, P0455, P0456 [LF]</a> .)
P0443	Purge solenoid valve circuit problem	ON	2	CCM	C, O, R	×	(See <a href="#">DTC P0443 [LF]</a> .)
P0446	Change over valve (COV) (EVAP system leak detection pump) stuck close	ON	2	CCM	C, R	×	(See <a href="#">DTC P0446 [LF]</a> .)
P0455	Evaporative emission control system leak detected (gross leak)	ON	2	Evaporative system	C, R	×	(See <a href="#">DTC P0442, P0455, P0456 [LF]</a> .)
P0456	Evaporative emission control system leak detected (very small leak)	ON	2	Evaporative system	C, R	×	(See <a href="#">DTC P0442, P0455, P0456 [LF]</a> .)
P0461	Fuel gauge sender unit range/performance problem	ON	2	CCM	C	×	(See <a href="#">DTC P0461 [LF]</a> .)

P0462	Fuel gauge sender unit circuit low input	ON	2	CCM	C, O, R	×	(See <a href="#">DTC P0462 [LF].</a> )
P0463	Fuel gauge sender unit circuit high input	ON	2	CCM	C, O, R	×	(See <a href="#">DTC P0463 [LF].</a> )
P0480	Cooling fan relay No.1 control circuit malfunction	OFF	1	Other	C, O, R	×	(See <a href="#">DTC P0480 [LF].</a> )
P0481	Cooling fan relay No.2 control circuit malfunction	OFF	1	Other	C, O, R	×	(See <a href="#">DTC P0481 [LF].</a> )
P0482	Cooling fan relay No.3 control circuit malfunction	OFF	1	Other	C, O, R	×	(See <a href="#">DTC P0482 [LF].</a> )
P0500	VSS circuit problem	ON	2	CCM	C	×	(See <a href="#">DTC P0500 [LF].</a> )
P0505	Idle speed control system problem	OFF	—	—	R	—	(See <a href="#">DTC P0505 [LF].</a> )
P0506	Idle speed control system RPM lower than expected	ON	2	CCM	C	×	(See <a href="#">DTC P0506 [LF].</a> )
P0507	Idle speed control system RPM higher than expected	ON	2	CCM	C	×	(See <a href="#">DTC P0507 [LF].</a> )
P050A	Cold start idle air control system performance	ON	2	Cold start emission reduction strategy monitoring	C, R	×	(See <a href="#">DTC P050A[LF].</a> )
P050B	Cold start ignition timing performance	ON	2	Cold start emission reduction strategy monitoring	C, R	×	(See <a href="#">DTC P050B[LF].</a> )
P0550	PSP switch circuit malfunction	ON	2	CCM	C	×	(See <a href="#">DTC P0550 [LF].</a> )
P0564	Cruise control switch circuit malfunction	OFF	1	Other	C	×	(See <a href="#">DTC P0564 [LF].</a> )
P0571	Brake switch circuit problem	OFF	1	Other	C	×	(See <a href="#">DTC P0571 [LF].</a> )
P0601	PCM memory check sum error	ON	1	CCM	C, O, R	×	(See <a href="#">DTC P0601 [LF].</a> )
					C, O,		(See <a href="#">DTC P0602</a> )



P0602	PCM programming error	ON	1	CCM	R	×	[LF].)
P0604	PCM random access memory (RAM) error	ON	1	CCM	C, O, R	×	(See <a href="#">DTC P0604 [LF].)</a>
P0606	PCM processor	ON	1	CCM	C, O, R	×	(See <a href="#">DTC P0606 [LF].)</a>
P0610	PCM vehicle options error	ON	1	CCM	C, O, R	×	(See <a href="#">DTC P0610 [LF].)</a>
P0638	Throttle actuator control circuit range/performance problem	ON	1	CCM	C	×	(See <a href="#">DTC P0638 [LF].)</a>
P0661	Variable intake air solenoid valve circuit low input	OFF	1	Other	C, O, R	×	(See <a href="#">DTC P0661 [LF].)</a>
P0662	Variable intake air solenoid valve circuit high input	OFF	1	Other	C, O, R	×	(See <a href="#">DTC P0662 [LF].)</a>
P0703	Brake switch input circuit problem	ON	2	CCM	C	×	(See <a href="#">DTC P0703 [LF].)</a>
P0704	Clutch pedal position (CPP) switch input circuit problem	ON	2	CCM	C	×	(See <a href="#">DTC P0704 [LF].)</a>
P0850	Neutral switch input circuit problem	ON	2	CCM	C	×	(See <a href="#">DTC P0850 [LF].)</a>
P1260	Immobilizer system problem	OFF	1	Other	C, O	—	(See <a href="#">DTC P1260 [LF].)</a>
P2004	Variable tumble shutter valve stuck open	ON	2	CCM	C, R	×	(See <a href="#">DTC P2004 [LF].)</a>
P2006	Variable tumble shutter valve stuck closed	ON	2	CCM	C, R	×	(See <a href="#">DTC P2006 [LF].)</a>
P2009	Variable tumble solenoid valve circuit low input	ON	2	CCM	C, O, R	×	(See <a href="#">DTC P2009 [LF].)</a>
P2010	Variable tumble solenoid valve circuit high input	ON	2	CCM	C, O, R	×	(See <a href="#">DTC P2010 [LF].)</a>
P2088	Oil control valve (OCV) circuit low	ON	1	CCM	C, O, R	×	(See <a href="#">DTC P2088 [LF].)</a>

P2089	Oil control valve (OCV) circuit high	ON	1	CCM	C, O, R	×	(See <a href="#">DTC P2089 [LF].</a> )
P2096	Target A/F feedback system too lean	ON	2	Fuel system	C	×	(See <a href="#">DTC P2096 [LF].</a> )
P2097	Target A/F feedback system too rich	ON	2	Fuel system	C	×	(See <a href="#">DTC P2097 [LF].</a> )
P2101	Throttle actuator circuit range/performance	ON	1	CCM	C, R	×	(See <a href="#">DTC P2101 [LF].</a> )
P2107	Throttle actuator control module processor error	ON	1	CCM	C, R	×	(See <a href="#">DTC P2107 [LF].</a> )
P2108	Throttle actuator control module performance error	ON	1	CCM	C, R	×	(See <a href="#">DTC P2108 [LF].</a> )
P2109	TP sensor minimum stop range/performance problem	ON	1	CCM	C, R	×	(See <a href="#">DTC P2109 [LF].</a> )
P2112	Throttle actuator control system range/performance problem	ON	1	CCM	C, R	×	(See <a href="#">DTC P2112 [LF].</a> )
P2119	Throttle actuator control throttle body range/performance problem	ON	2	CCM	C, R	×	(See <a href="#">DTC P2119 [LF].</a> )
P2122	APP sensor No.1 circuit low input	ON	1	CCM	C, O, R	×	(See <a href="#">DTC P2122 [LF].</a> )
P2123	APP sensor No.1 circuit high input	ON	1	CCM	C, O, R	×	(See <a href="#">DTC P2123 [LF].</a> )
P2127	APP sensor No.2 circuit low input	ON	1	CCM	C, O, R	×	(See <a href="#">DTC P2127 [LF].</a> )
P2128	APP sensor No.2 circuit high input	ON	1	CCM	C, O, R	×	(See <a href="#">DTC P2128 [LF].</a> )
P2135	TP sensor No.1/No.2 voltage correlation problem	ON	1	CCM	C, O, R	×	(See <a href="#">DTC P2135 [LF].</a> )
P2138	APP sensor No.1/No.2 voltage correlation problem	ON	1	CCM	C, O, R	×	(See <a href="#">DTC P2138 [LF].</a> )
P2177	Fuel system too lean at off idle	ON	2	Fuel system	C, R	×	(See <a href="#">DTC P2177 [LF].</a> )

P2178	Fuel system too rich at off idle	ON	2	Fuel system	C, R	×	(See <a href="#">DTC P2178 [LF]</a> .)
P2187	Fuel system too lean at idle	ON	2	Fuel system	C, R	×	(See <a href="#">DTC P2187 [LF]</a> .)
P2188	Fuel system too rich at idle	ON	2	Fuel system	C, R	×	(See <a href="#">DTC P2188 [LF]</a> .)
P2195	Front HO2S signal stuck lean	ON	2	HO2S	C	×	(See <a href="#">DTC P2195 [LF]</a> .)
P2196	Front HO2S signal stuck rich	ON	2	HO2S	C	×	(See <a href="#">DTC P2196 [LF]</a> .)
P2228	BARO sensor circuit low input	ON	1	CCM	C, O, R	×	(See <a href="#">DTC P2228 [LF]</a> .)
P2229	BARO sensor circuit high input	ON	1	CCM	C, O, R	×	(See <a href="#">DTC P2229 [LF]</a> .)
P2401	EVAP system leak detection pump motor circuit low	ON	2	CCM	C, R	×	(See <a href="#">DTC P2401 [LF]</a> .)
P2402	EVAP system leak detection pump motor circuit high	ON	2	CCM	C, R	×	(See <a href="#">DTC P2402 [LF]</a> .)
P2404	EVAP system leak detection pump sense circuit problem	ON	2	CCM	C, R	×	(See <a href="#">DTC P2404 [LF]</a> .)
P2405	EVAP system leak detection pump sense circuit low input	ON	2	CCM	C, R	×	(See <a href="#">DTC P2405 [LF]</a> .)
P2407	EVAP system leak detection pump sense circuit intermittent	ON	2	CCM	C, R	×	(See <a href="#">DTC P2407 [LF]</a> .)
P2502	Charging system voltage problem	OFF	1	Other	C, R	×	(See <a href="#">DTC P2502 [LF]</a> .)
P2503	Charging system voltage low	OFF	1	Other	C, R	×	(See <a href="#">DTC P2503 [LF]</a> .)
P2504	Charging system voltage high	OFF	1	Other	C, R	×	(See <a href="#">DTC P2504 [LF]</a> .)
P2507	PCM B+ voltage low	ON	1	CCM	C, O, R	×	(See <a href="#">DTC P2507 [LF]</a> .)

P2610	PCM internal engine off timer performance	ON	2	CCM	C	×	(See <b>DTC P2610 [LF].</b> )
U0073	CAN system communication error	(See <b>DTC TABLE [MULTIPLEX COMMUNICATION SYSTEM]</b> )					
U0101	Communication error to TCM	(See <b>DTC TABLE [MULTIPLEX COMMUNICATION SYSTEM]</b> )					
U0121	Communication error to ABS HU/CM	(See <b>DTC TABLE [MULTIPLEX COMMUNICATION SYSTEM]</b> )					
U0155	Communication error to instrument cluster	(See <b>DTC TABLE [MULTIPLEX COMMUNICATION SYSTEM]</b> )					

\*1

**C: CMDTC self-test, O: KOEO self-test, R: KOER self-test**

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### DTC P0011 [LF]

DTC P0011	CMP timing over-advanced
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The actual valve timing is over-advanced by <b>15 °</b> from the target valve timing for specified period when the oil control valve (OCV) is controlled in the maximum valve timing retard condition.</li> </ul> <p style="text-align: center;"><b>Monitoring condition</b></p> <ul style="list-style-type: none"> <li>Engine coolant temperature is <b>above 63 °C {145.4 °F}</b></li> </ul> <p style="text-align: center;"><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>OCV malfunction</li> <li>Spool valve in OCV is stuck in advanced position</li> <li>Variable valve timing actuator is stuck in advanced position</li> <li>Loose timing chain or improper valve timing due to timing chain slippage</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.

2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>• Verify related Service Bulletins and/or on-line repair information availability.</li> <li>• Is any related repair information available?</li> </ul>	<div>Yes</div> <div>Perform repair or diagnosis according to the available repair information.</div> <div> <ul style="list-style-type: none"> <li>• If the vehicle is not repaired, go to the next step.</li> </ul> </div> <div>No</div> <div>Go to the next step.</div>
3	<b>INSPECT OCV FOR MALFUNCTION</b> <ul style="list-style-type: none"> <li>• Start the engine.</li> <li>• Increase the engine speed.</li> <li>• Stop the engine.</li> <li>• Remove the OCV.</li> </ul> <div>(See <b>OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION [LF]</b>.)</div> <ul style="list-style-type: none"> <li>• Inspect the position of the spool valve in the OCV.</li> </ul> <div>(See <b>OIL CONTROL VALVE (OCV) INSPECTION [LF]</b>.)</div> <ul style="list-style-type: none"> <li>• Is the spool valve located at the valve retard position?</li> </ul>	<div>Yes</div> <div>Go to the next step.</div> <div>No</div> <div>Replace the OCV, then go to Step 6.</div> <div>(See <b>OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION [LF]</b>.)</div>
4	<b>INSPECT STOPPER PIN MECHANISM</b> <ul style="list-style-type: none"> <li>• Remove the timing chain.</li> <li>• Inspect the stopper pin.</li> </ul> <div>(See <b>VARIABLE VALVE TIMING ACTUATOR INSPECTION [LF]</b>.)</div> <ul style="list-style-type: none"> <li>• Is the stopper pin mechanism normal?</li> </ul>	<div>Yes</div> <div>Go to the next step.</div> <div>No</div> <div>Replace the variable valve timing actuator, then go to Step 6.</div> <div>(See <b>VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION [LF]</b>.)</div>
5	<b>INSPECT ROTOR POSITION</b> <ul style="list-style-type: none"> <li>• Remove the variable valve timing actuator.</li> <li>• Is the rotor position at the maximum valve timing retard?</li> </ul>	<div>Yes</div> <div> <b>VARIABLE VALVE TIMING MECHANISM IS NORMAL</b>  <b>NOTE:</b> <ul style="list-style-type: none"> <li>• This DTC is detected as an intermittent concern.</li> <li>• An intermittent concern might be removed using the cleaning mode of</li> </ul> </div>

			the variable valve timing control function.
			Go to the next step.
		No	Replace the variable valve timing actuator, go to the next step.  (See <a href="#">VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION [LF]</a> .)
6	<b>VERIFY TROUBLESHOOTING OF DTC P0011 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Turn the ignition switch off.</li> <li>• Start the engine and warm it up completely.</li> <li>• Is the same DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step.  (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
7	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform the "AFTER REPAIR PROCEDURE".  (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</li> <li>• Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection.  (See <a href="#">DTC TABLE [LF]</a> .)
		No	Troubleshooting completed.

## 2008 - MX-5 - Engine

### DTC P0012 [LF]

DTC P0012	CMP timing over-retarded
DETECTION CONDITION	<ul style="list-style-type: none"><li>Actual valve timing is over-retarded by <b>10 °</b> from the target valve timing for specified period when the oil control valve (OCV) system control is within the feedback range.</li></ul> <p style="text-align: center;"><b>Monitoring condition</b></p> <ul style="list-style-type: none"><li>Engine coolant temperature is <b>above 63 °C {145.4 °F}</b></li></ul> <p style="text-align: center;"><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>This is a continuous monitor (CCM).</li><li>The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>OCV malfunction</li><li>Low engine oil pressure</li><li>Spool valve in the OCV is stuck in retard position.</li><li>Variable valve timing actuator is stuck in retard position.</li><li>The following oil runners are clogged or have leakage.</li></ul> <p style="text-align: center;"><b>Oil runners</b></p> <ul style="list-style-type: none"><li>Between the oil pressure switch and the OCV</li><li>Between the OCV and the variable valve timing actuator</li><li>In the variable valve timing actuator</li></ul> <ul style="list-style-type: none"><li>Loose timing chain or improper valve timing due to timing chain slippage</li><li>PCM malfunction</li></ul>



## Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<b>VERIFY RELATED PENDING CODE OR STORED DTCS</b> <ul style="list-style-type: none"> <li>Is DTC P2088 or P2089 present?</li> </ul>	Yes	Go to the appropriate DTC troubleshooting procedure. (See <a href="#">DTC P2088 [LF]</a> or <a href="#">DTC P2089 [LF]</a> .)
		No	Go to the next step.
4	<b>VERIFY ENGINE OIL PRESSURE</b> <ul style="list-style-type: none"> <li>Start the engine.</li> <li>Does the oil pressure warning light illuminate?</li> </ul>	Yes	Inspect the engine oil pressure, then go to Step 8. (See <a href="#">OIL PRESSURE INSPECTION [LF]</a> .)
		No	Go to the next step.
5	<b>VERIFY TIMING CHAIN INSTALLATION</b> <ul style="list-style-type: none"> <li>Stop the engine.</li> <li>Remove the cylinder head cover.</li> <li>Is the camshaft timing mark at the correct point?</li> </ul> (See <a href="#">TIMING CHAIN REMOVAL/INSTALLATION [LF]</a> .)	Yes	Go to the next step.
		No	Reinstall the timing chain, then go to Step 8.
6	<b>INSPECT OCV</b> <ul style="list-style-type: none"> <li>Inspect the OCV.</li> </ul> (See <a href="#">OIL CONTROL VALVE (OCV) INSPECTION [LF]</a> .)	Yes	Replace the OCV, then go to Step 8.  (See <a href="#">OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION [LF]</a> .)

	<ul style="list-style-type: none"><li>Is there any malfunction?</li></ul>	No	Go to the next step.
7	<b>INSPECT ENGINE OIL RUNNER</b> <ul style="list-style-type: none"><li>Inspect the following engine oil runners for clogging or leakage.<ul style="list-style-type: none"><li>Between oil pressure switch and OCV</li><li>Between OCV and variable valve timing actuator</li><li>In variable valve timing actuator</li></ul></li><li>Is there any clogging or leakage?</li></ul>	Yes	Repair or replace the suspected runner, then go to the next step.
		No	<b>VARIABLE VALVE TIMING MECHANISM IS NORMAL</b> <b>NOTE:</b> <ul style="list-style-type: none"><li>This DTC is detected by intermittent concern.</li><li>An intermittent concern might be removed using the cleaning mode of the variable valve timing control function.</li></ul> Go to the next step.
8	<b>VERIFY TROUBLESHOOTING OF DTC P0012 COMPLETED</b> <ul style="list-style-type: none"><li>Make sure to reconnect all disconnected connectors.</li><li>Clear the DTC from the PCM memory using the M-MDS.</li><li>Turn the ignition switch off.</li><li>Start the engine and warm it up completely.</li><li>Is the PENDING CODE for this DTC present?</li></ul>	Yes	Replace the PCM, then go to the next step. (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)
		No	Go to the next step.
9	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>Perform the "AFTER REPAIR PROCEDURE". (See <b>AFTER REPAIR PROCEDURE [LF]</b>)</li></ul>	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.

- |  |   |  |
|--|---|--|
|  | <ul style="list-style-type: none"><li>• Are any DTCs present?</li></ul> |  |
|--|---|--|

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## 2008 - MX-5 - Engine

### DTC P0016 [LF]

DTC P0016	CKP-CMP correlation
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors the input pulses from the CKP sensor and CMP sensor. If the input pulse pick-up timing do not match each other, the PCM determines that the camshaft position does not coincide with the crankshaft position.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Poor connection of connector</li> <li>CMP sensor malfunction</li> <li>CKP sensor malfunction</li> <li>Damaged or scratched CMP sensor pulse wheel</li> <li>Damaged or scratched CKP sensor pulse wheel</li> <li>Foreign material on CMP sensor</li> <li>Foreign material on CMP sensor</li> <li>Improper valve timing</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA</li> </ul>	YesGo to the next step.

	been recorded?	No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>• Verify related Service Bulletins and/or on-line repair information availability.</li> <li>• Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>• If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<b>INSPECT CMP SENSOR CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the CMP sensor connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 13.
		No	Go to the next step.
4	<b>INSPECT CMP SENSOR FOR FOREIGN MATERIAL</b> <ul style="list-style-type: none"> <li>• Remove the CMP sensor.</li> <li>• Inspect the CMP sensor for foreign materials.</li> <li>• Is there any foreign material on the CMP sensor?</li> </ul>	Yes	Remove foreign material from the CMP sensor, then go to Step 13.
		No	Go to the next step.
5	<b>INSPECT CMP SENSOR PULSE WHEEL</b> <ul style="list-style-type: none"> <li>• Visually inspect the CMP sensor pulse wheel.</li> <li>• Are there any damage or scratches at the CMP sensor pulse wheel?</li> </ul>	Yes	Replace the camshaft, then go to Step 13. (See <a href="#">CYLINDER HEAD GASKET REPLACEMENT [LF]</a> .)
		No	Go to the next step.
6	<b>INSPECT CMP SENSOR</b> <ul style="list-style-type: none"> <li>• Inspect the CMP sensor. (See <a href="#">CAMSHAFT POSITION (CMP) SENSOR INSPECTION [LF]</a>.)</li> <li>• Is the CMP sensor normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the CMP, then go to Step 13.
7	<b>INSPECT CKP SENSOR CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> </ul>	Yes	Repair or replace the terminal, then go to Step 13.
		No	Go to the next step.

	<p>Disconnect the CKP sensor connector.</p> <ul style="list-style-type: none"> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>		
8	<b>INSPECT CKP SENSOR FOR FOREIGN MATERIAL</b> <ul style="list-style-type: none"> <li>Remove the CKP sensor.</li> <li>Inspect the CKP sensor for foreign material.</li> <li>Is there any foreign material on the CKP sensor?</li> </ul>	Yes	Remove foreign material from the CKP sensor, then go to Step 13.
		No	Go to the next step.
9	<b>INSPECT CKP SENSOR PULSE WHEEL</b> <ul style="list-style-type: none"> <li>Visually inspect the CKP sensor pulse wheel.</li> <li>Are there any damage or scratches on the CKP sensor pulse wheel?</li> </ul>	Yes	Replace the CKP sensor pulse wheel, then go to Step 13. (See <b>TIMING CHAIN REMOVAL/INSTALLATION [LF]</b> .)
		No	Go to the next step.
10	<b>INSPECT CKP SENSOR</b> <ul style="list-style-type: none"> <li>Inspect the CKP sensor. (See <b>CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [LF]</b>.)</li> <li>Is the CKP sensor normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the CKP sensor, then go to Step 13. (See <b>CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION [LF]</b> .)
11	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the PCM sensor connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 13.
		No	Go to the next step.
12	<b>INSPECT VALVE TIMING</b> <ul style="list-style-type: none"> <li>Inspect valve timing. (See <b>TIMING CHAIN REMOVAL/INSTALLATION [LF]</b>.)</li> <li>Is valve timing normal?</li> </ul>	Yes	Go to the next step.
		No	Adjust the valve timing properly, then go to the next step. (See <b>TIMING CHAIN REMOVAL/INSTALLATION [LF]</b> .)
13	<b>VERIFY TROUBLESHOOTING OF DTC</b>	Yes	Replace PCM, then go to the next step.

	<b>P0016 COMPLETED</b> <ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Turn the ignition switch to the ON position.</li><li>• Clear the DTC from the PCM memory using the M-MDS.</li><li>• Start the engine and run it at the idle.</li><li>• Retrieve the DTC using the M-MDS.</li><li>• Is the PENDING CODE for this DTC present?</li></ul>		(See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
14	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform "AFTER REPAIR PROCEDURE".</li></ul> (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a> .) <ul style="list-style-type: none"><li>• Is there any DTC present?</li></ul>	Yes	Go to applicable DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .)
		No	Troubleshooting completed.

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### DTC P0030 [LF]

DTC P0030	Front HO2S heater control circuit problem
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors the front HO2S impedance when under the front HO2S heater control for <b>200 s</b>. If the impedance is <b>more than 44 ohms</b>, the PCM determines that there is a front HO2S heater control circuit problem.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is an intermittent monitor (HO2S heater).</li> <li>The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Front HO2S heater malfunction</li> <li>Connector or terminal malfunction</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b>	YesGo to the next step.
	<ul style="list-style-type: none"> <li>Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S heater related) been recorded?</li> </ul>	NoRecord the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or</li> </ul>	YesPerform repair or diagnosis according to the available repair information.



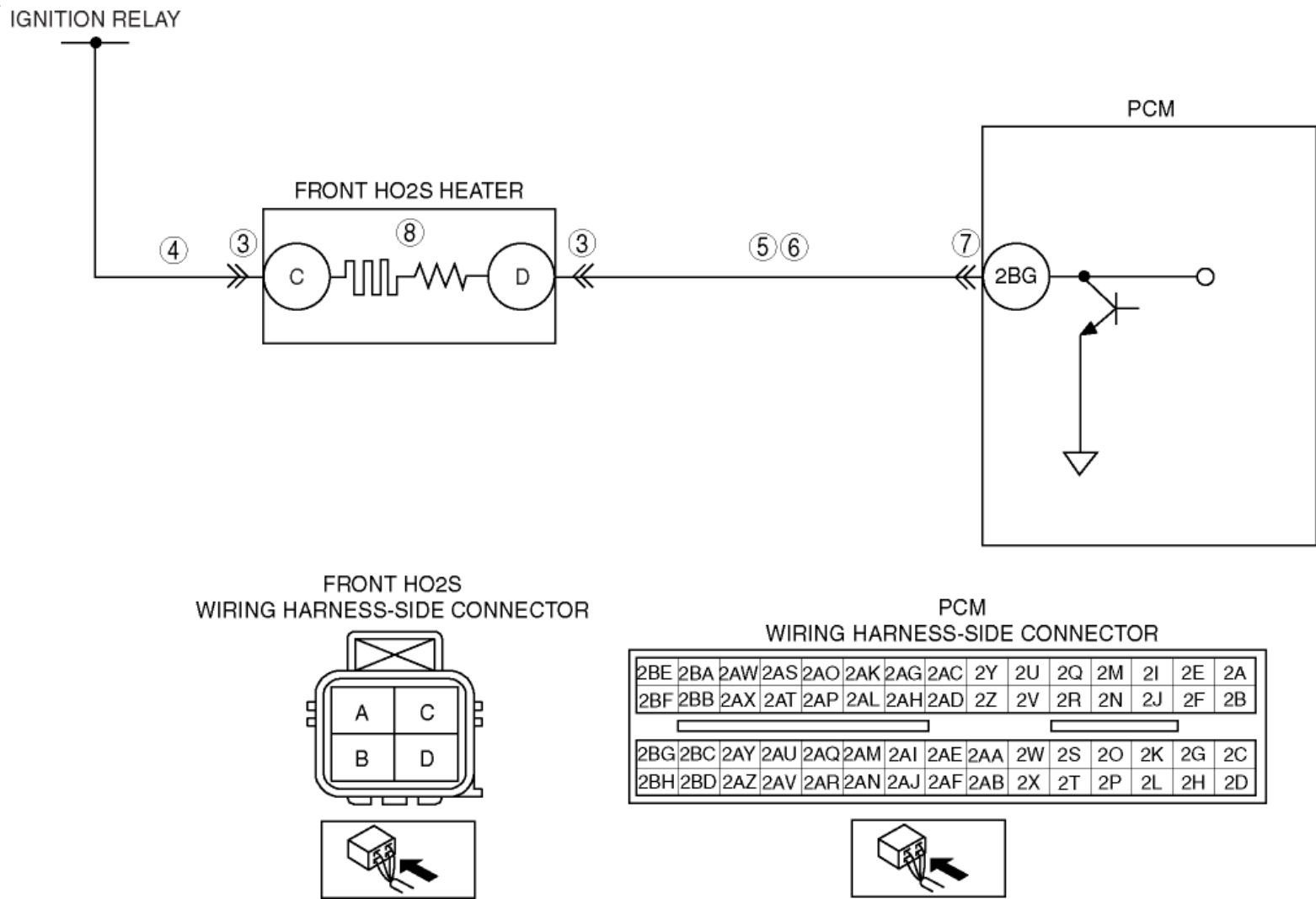
	<p>on-line repair information availability.</p> <ul style="list-style-type: none"> <li>Is any related repair information available?</li> </ul>		<ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<p><b>VERIFY RELATED PENDING CODE OR STORED DTC</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch off, then to the ON position (Engine off).</li> <li>Verify the related PENDING CODE or stored DTCs.</li> <li>Are other DTCs present?</li> </ul>	Yes	Go to the appropriate DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .)
		No	Go to the next step.
4	<p><b>INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the front HO2S connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, and corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
5	<p><b>INSPECT FRONT HO2S HEATER</b></p> <ul style="list-style-type: none"> <li>Inspect the front HO2S heater. (See <a href="#">FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF]</a>.)</li> <li>Is there any malfunction?</li> </ul>	Yes	Replace the front HO2S, then go to Step 7. (See <a href="#">FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
6	<p><b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the PCM connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, and corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	<p><b>VERIFY TROUBLESHOOTING OF DTC P0030 COMPLETED</b></p> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> </ul>	Yes	Replace the PCM, then go to the next step. (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.

	<ul style="list-style-type: none"><li>• Perform the KOEO self-test (using M-MDS) or the HO2S heater, HO2S, and TWC Repair Verification Drive Mode (not using M-MDS).</li></ul> <p>(See <a href="#">KOEO/KOER SELF TEST [LF]</a>.)</p> <p>(See <a href="#">OBD-II DRIVE MODE [LF]</a>.)</p> <ul style="list-style-type: none"><li>• Is the PENDING CODE for this DTC present?</li></ul>		
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "AFTER REPAIR PROCEDURE".</li></ul> <p>(See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</p> <ul style="list-style-type: none"><li>• Are any DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection.  (See <a href="#">DTC TABLE [LF]</a> .)
		No	DTC troubleshooting completed.

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DTC P0031 [LF]

DTC P0031	Front HO2S heater circuit low input
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors the front HO2S heater control voltage when the PCM turns the front HO2S heater on. If the control voltage is <b>less than 50%</b> of the battery voltage, the PCM determines that the front HO2S heater control circuit voltage is low.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (HO2S heater).</li><li>• The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Front HO2S heater malfunction</li><li>• Connector or terminal malfunction</li><li>• Open circuit in wiring harness between ignition relay and front HO2S terminal C</li><li>• Short to ground in wiring harness between ignition relay and front HO2S terminal C</li><li>• Open circuit in wiring harness between front HO2S terminal D and PCM terminal 2BG</li><li>• Short to ground in wiring harness between front HO2S terminal D and PCM terminal 2BG</li><li>• PCM malfunction</li></ul>



# Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S heater related) been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the front HO2S connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, and corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace the terminal, then go to Step 9.
		No Go to the next step.
	<b>INSPECT FRONT HO2S HEATER POWER CIRCUIT FOR OPEN</b>	

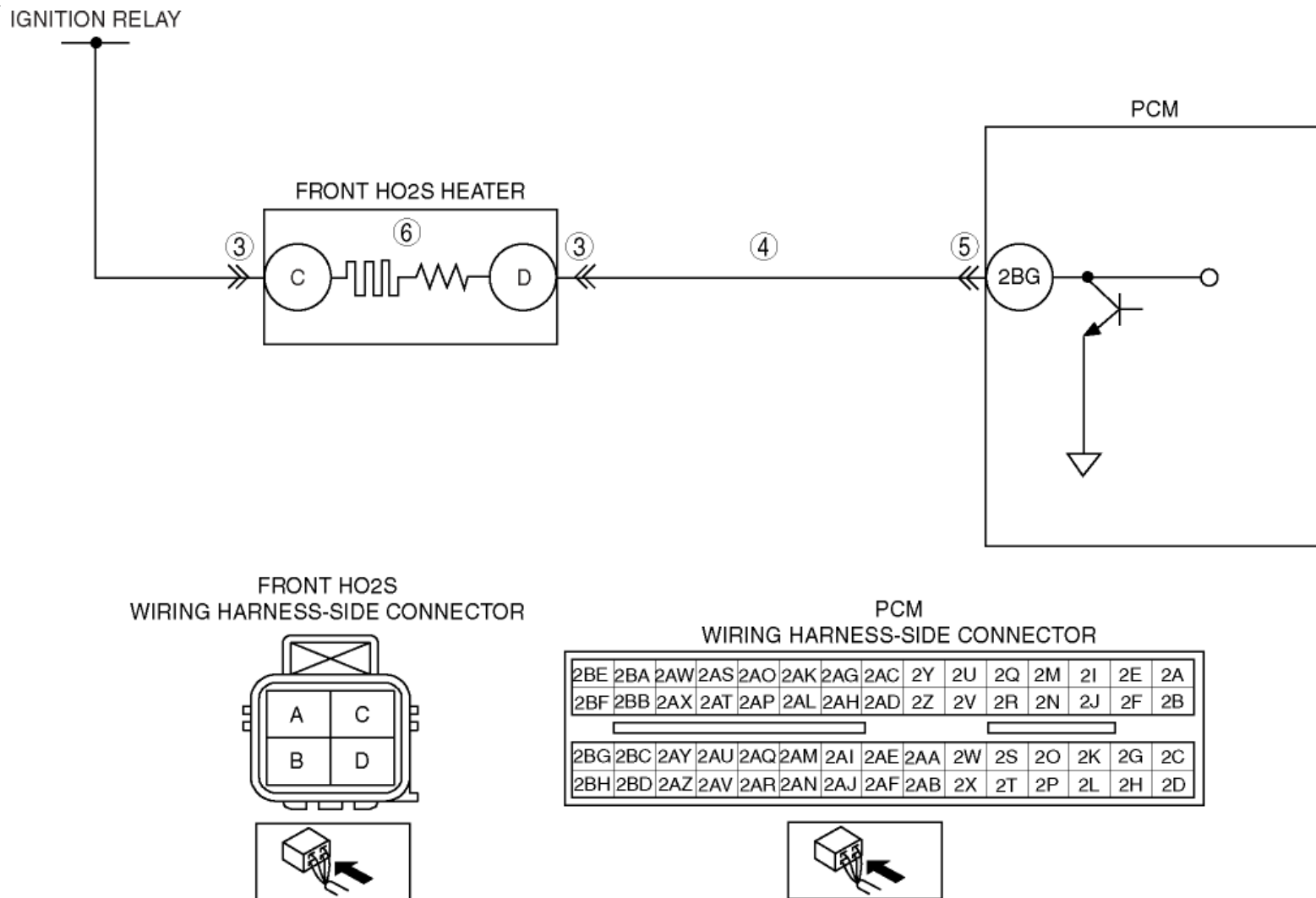
4	<b>CIRCUIT OR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Measure the voltage between front HO2S terminal C (wiring harness-side) and body ground.</li> <li>Is the voltage <b>B+</b>?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit or short to ground, then go to Step 9.
5	<b>INSPECT FRONT HO2S HEATER CONTROL CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Inspect for continuity between front HO2S terminal D (wiring harness-side) and body ground.</li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 9.
		No	Go to the next step.
6	<b>INSPECT FRONT HO2S HEATER CONTROL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Inspect for continuity between front HO2S terminal D (wiring harness-side) and PCM terminal 2BG (wiring harness-side).</li> <li>Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to Step 9.
7	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the PCM connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, and corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
8	<b>INSPECT FRONT HO2S HEATER</b> <ul style="list-style-type: none"> <li>Inspect the front HO2S heater. (See <a href="#">FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF]</a>.)</li> <li>Is there any malfunction?</li> </ul>	Yes	Replace the front HO2S, then go to the next step. (See <a href="#">FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
9	<b>VERIFY TROUBLESHOOTING OF DTC P0031 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Perform the KOEO self-test (using M-MDS) or the HO2S heater, HO2S, and TWC Repair Verification Drive Mode (not using M-MDS). (See <a href="#">KOEO/KOER SELF TEST [LF]</a>.) (See <a href="#">OBD-II DRIVE MODE [LF]</a>.)</li> <li>Is the PENDING CODE for this DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step. (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the "AFTER REPAIR PROCEDURE". (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</li> <li>Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .)
		No	DTC troubleshooting completed.



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DTC P0032 [LF]

DTC P0032	Front HO2S heater circuit high input
DETECTION CONDITION	<ul style="list-style-type: none"><li>The PCM monitors the front HO2S heater control voltage when the PCM turns the front HO2S heater off. If the control voltage <b>exceeds 50%</b> of the battery voltage, the PCM determines that the front HO2S heater control circuit voltage is high.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>This is a continuous monitor (HO2S heater).</li><li>The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Front HO2S heater malfunction</li><li>Connector or terminal malfunction</li><li>Short to power supply in wiring harness between front HO2S terminal D and PCM terminal 2BG</li><li>PCM malfunction</li></ul>



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S heater related) been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the front HO2S connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, and corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace the terminal, then go to Step 7.
		No Go to the next step.
	<b>INSPECT FRONT HO2S HEATER CONTROL CIRCUIT FOR SHORT</b>	

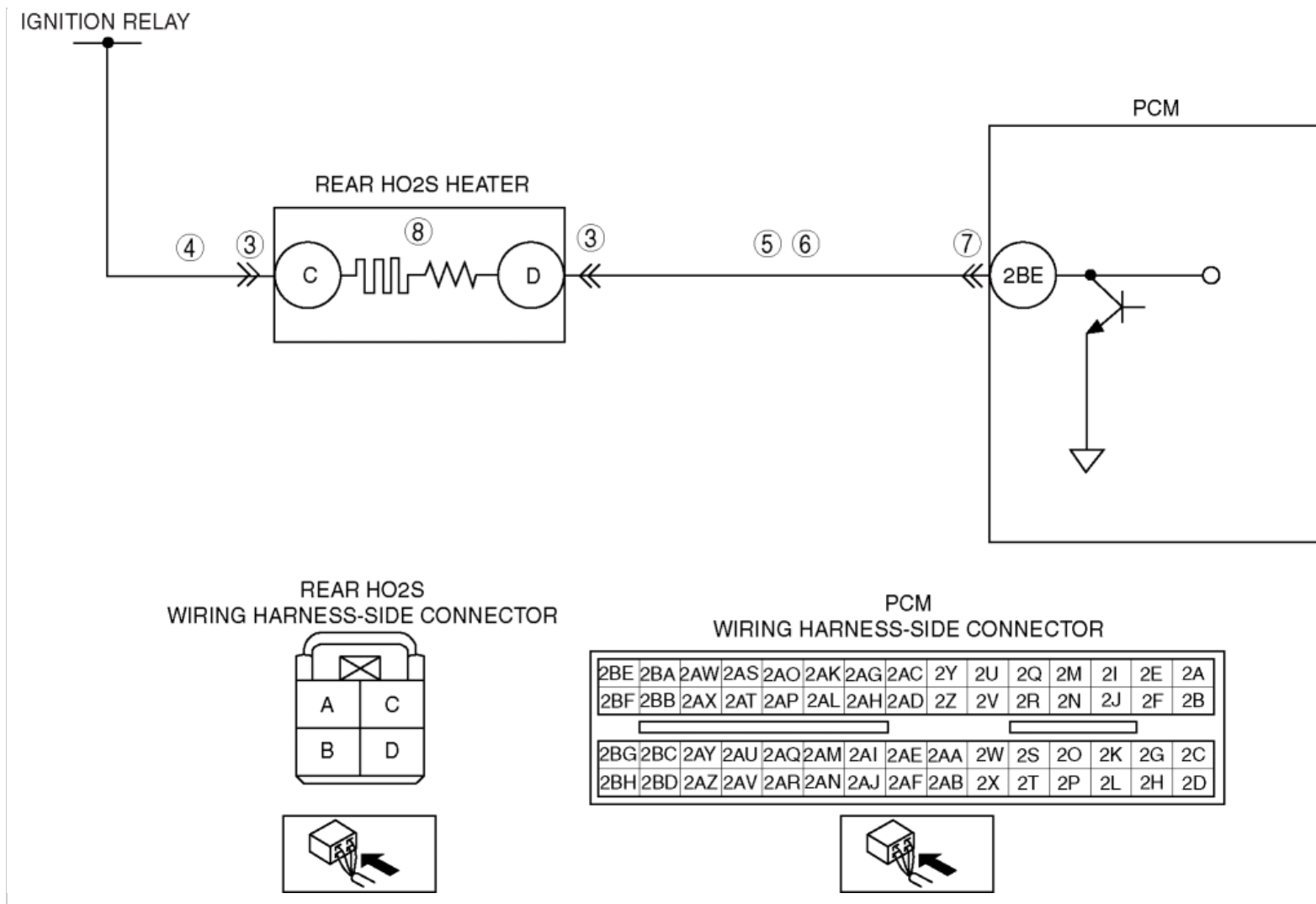


4	<b>TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position (Engine off).</li> <li>• Measure the voltage between front HO2S terminal D (wiring harness-side) and body ground.</li> <li>• Is the voltage <b>B+</b>?</li> </ul>	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
5	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the PCM connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, and corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
6	<b>INSPECT FRONT HO2S HEATER</b> <ul style="list-style-type: none"> <li>• Inspect the front HO2S heater. (See <a href="#">FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF]</a>.)</li> <li>• Is there any malfunction?</li> </ul>	Yes	Replace the front HO2S, then go to the next step. (See <a href="#">FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
7	<b>VERIFY TROUBLESHOOTING OF DTC P0032 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Perform the KOEO self-test (using M-MDS) or the HO2S heater, HO2S, and TWC Repair Verification Drive Mode (not using M-MDS). (See <a href="#">KOEO/KOER SELF TEST [LF]</a>.) (See <a href="#">OBD-II DRIVE MODE [LF]</a>.)</li> <li>• Is the PENDING CODE for this DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step. (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform the "AFTER REPAIR PROCEDURE". (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</li> <li>• Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .)
		No	DTC troubleshooting completed.

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DTC P0037 [LF]

DTC P0037	Rear HO2S heater circuit low input
DETECTION CONDITION	<ul style="list-style-type: none"><li>The PCM monitors the rear HO2S heater control voltage when the PCM turns the rear HO2S heater on. If the control voltage is <b>less than 57%</b> of the battery voltage, the PCM determines that the rear HO2S heater control circuit voltage is low.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>This is a continuous monitor (HO2S heater).</li><li>The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Rear HO2S heater malfunction</li><li>Connector or terminal malfunction</li><li>Open circuit in wiring harness between ignition relay and rear HO2S terminal C</li><li>Short to ground in wiring harness between ignition relay and rear HO2S terminal C</li><li>Open circuit in wiring harness between rear HO2S terminal D and PCM terminal 2BE</li><li>Short to ground in wiring harness between rear HO2S terminal D and PCM terminal 2BE</li><li>PCM malfunction</li></ul>



## Diagnostic procedure

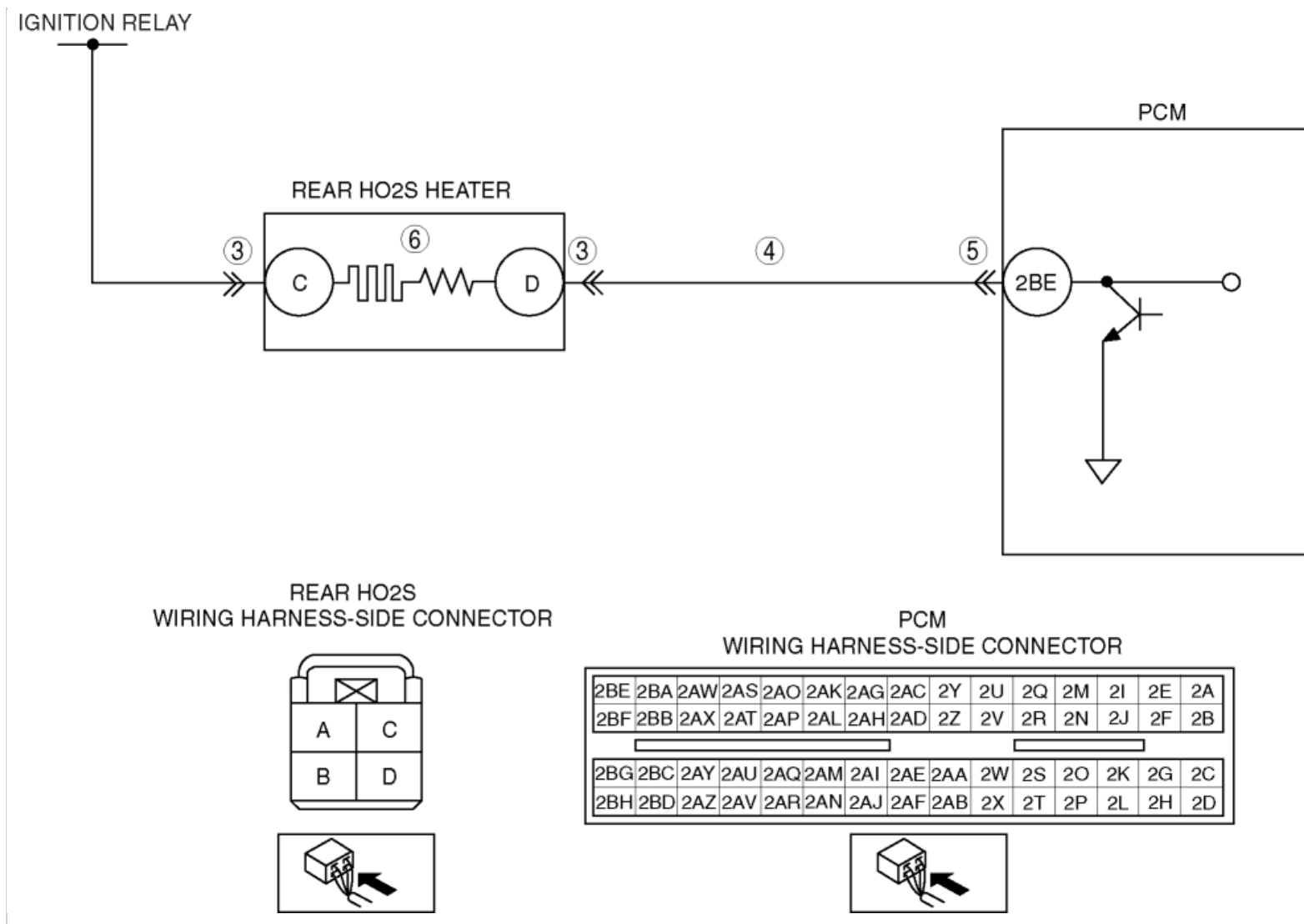
STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S heater related) been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>INSPECT REAR HO2S CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the rear HO2S connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, and corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace the terminal, then go to Step 9.
		No Go to the next step.
4	<b>INSPECT REAR HO2S HEATER POWER CIRCUIT FOR OPEN</b>	Yes Go to the next step.

	<b>CIRCUIT OR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position (Engine off).</li> <li>• Measure the voltage between rear HO2S terminal C (wiring harness-side) and body ground.</li> <li>• Is the voltage <b>B+</b>?</li> </ul>		No	Repair or replace the wiring harness for a possible open circuit or short to ground, then go to Step 9.
5	<b>INSPECT REAR HO2S HEATER CONTROL CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Inspect for continuity between rear HO2S terminal D (wiring harness-side) and body ground.</li> <li>• Is there continuity?</li> </ul>		Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 9.
			No	Go to the next step.
6	<b>INSPECT REAR HO2S HEATER CONTROL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Inspect for continuity between rear HO2S terminal D (wiring harness-side) and PCM terminal 2BE (wiring harness-side).</li> <li>• Is there continuity?</li> </ul>		Yes	Go to the next step.
			No	Repair or replace the wiring harness for a possible open circuit, then go to Step 9.
7	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the PCM connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, and corrosion).</li> <li>• Is there any malfunction?</li> </ul>		Yes	Repair or replace the terminal, then go to Step 9.
			No	Go to the next step.
8	<b>INSPECT REAR HO2S HEATER</b> <ul style="list-style-type: none"> <li>• Inspect the rear HO2S heater. (See <a href="#">REAR HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF]</a>.)</li> <li>• Is there any malfunction?</li> </ul>		Yes	Replace the rear HO2S, then go to the next step. (See <a href="#">REAR HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]</a> .)
			No	Go to the next step.
9	<b>VERIFY TROUBLESHOOTING OF DTC P0037 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Perform the KOEO self-test (using M-MDS) or the HO2S heater, HO2S, and TWC Repair Verification Drive Mode (not using M-MDS). (See <a href="#">KOEO/KOER SELF TEST [LF]</a>.) (See <a href="#">OBD-II DRIVE MODE [LF]</a>.)</li> <li>• Is the PENDING CODE for this DTC present?</li> </ul>		Yes	Replace the PCM, then go to the next step. (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
			No	Go to the next step.
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform the "AFTER REPAIR PROCEDURE". (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</li> <li>• Are any DTCs present?</li> </ul>		Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .)
			No	DTC troubleshooting completed.

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DTC P0038 [LF]

DTC P0038	Rear HO2S heater circuit high input
DETECTION CONDITION	<ul style="list-style-type: none"><li>The PCM monitors the rear HO2S heater control voltage when the PCM turns the rear HO2S heater off. If the control voltage <b>exceeds 25%</b> of the battery voltage, the PCM determines that the rear HO2S heater control circuit voltage is high.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>This is a continuous monitor (HO2S heater).</li><li>The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Rear HO2S heater malfunction</li><li>Connector or terminal malfunction</li><li>Short to power supply in wiring harness between rear HO2S terminal D and PCM terminal 2BE</li><li>PCM malfunction</li></ul>



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S heater related) been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>INSPECT REAR HO2S CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the rear HO2S connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, and corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace the terminal, then go to Step 7.
		No Go to the next step.

4	<b>INSPECT REAR HO2S HEATER CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position (Engine off).</li> <li>• Measure the voltage between rear HO2S terminal D (wiring harness-side) and body ground.</li> <li>• Is the voltage <b>B+</b>?</li> </ul>	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 7.
		No	Go to the next step.
5	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the PCM connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, and corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
6	<b>INSPECT REAR HO2S HEATER</b> <ul style="list-style-type: none"> <li>• Inspect the rear HO2S heater. (See <a href="#">REAR HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF]</a>.)</li> <li>• Is there any malfunction?</li> </ul>	Yes	Replace the rear HO2S, then go to the next step. (See <a href="#">REAR HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
7	<b>VERIFY TROUBLESHOOTING OF DTC P0038 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Perform the KOEO self-test (using M-MDS) or the HO2S heater, HO2S, and TWC Repair Verification Drive Mode (not using M-MDS). (See <a href="#">KOEO/KOER SELF TEST [LF]</a>.) (See <a href="#">OBD-II DRIVE MODE [LF]</a>.)</li> <li>• Is the PENDING CODE for this DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step. (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform the "AFTER REPAIR PROCEDURE". (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</li> <li>• Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .)
		No	DTC troubleshooting completed.

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DTC P0069 [LF]

DTC P0069	Manifold absolute pressure/atmospheric pressure correlation
DETECTION CONDITION	<div><ul style="list-style-type: none"><li>PCM monitors differences between intake manifold vacuum and atmospheric pressure. If the difference is <b>below –12 kPa {–90 mmHg, –3.5 inHg}</b> or <b>above 12 kPa { 90 mmHg, 3.5 inHg}</b> when the following conditions are met, the PCM determines that there is a MAP sensor performance problem.</li></ul><div>MONITORING CONDITION<ul style="list-style-type: none"><li>12–15 s from when ignition switch is turned off.</li><li>Intake air temperature is <b>above -10°C { 14°F}</b>.</li><li>Engine coolant temperature is <b>above 70°C {158°F}</b>.</li></ul></div><div>Diagnostic support note<ul style="list-style-type: none"><li>This is a continuous monitor (CCM).</li><li>The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul></div></div>
POSSIBLE CAUSE	<div><ul style="list-style-type: none"><li>MAP sensor malfunction or substandard performance</li><li>BARO sensor malfunction or substandard performance</li><li>PCM malfunction</li></ul></div>

Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	YesGo to the next step.
	<ul style="list-style-type: none"><li>Has FREEZE FRAME DATA been</li></ul>	NoRecord the FREEZE FRAME DATA on the



	recorded?		repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>	
		No	Go to the next step.
3	<b>VERIFY STORED DTC</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to off then start the engine.</li> <li>Have DTC P0107, P0108, P2228 or P2229 been stored?</li> </ul>	Yes Inspect and repair DTC P0107, P0108, P2228 or P2229.  (See <b>DTC TABLE [LF]</b> .)	
		No	Go to the next step.
4	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> <ul style="list-style-type: none"> <li>Is DTC P0069 on the FREEZE FRAME DATA?</li> </ul>	Yes Go to the next step.	
		No	Go to troubleshooting procedures for the DTC on the FREEZE FRAME DATA.
5	<b>INSPECT MAP SENSOR STUCK OPEN OR CLOSED</b> <ul style="list-style-type: none"> <li>Inspect MAP sensor.  (See <b>MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR INSPECTION [LF]</b>.)</li> <li>Is the MAP sensor normal?</li> </ul>	Yes Go to the next step.	
		No	Replace the MAP sensor, then go to step 7.  (See <b>MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR REMOVAL/INSTALLATION [LF]</b> .)
6	<b>INSPECT BARO SENSOR</b> <ul style="list-style-type: none"> <li>Inspect the BARO sensor.  (See <b>BAROMETRIC PRESSURE (BARO) SENSOR INSPECTION [LF]</b>.)</li> <li>Is the BARO sensor normal?</li> </ul>	Yes Go to the next step.	
		No	Replace the PCM, then go to the next step.  (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)
7	<b>VERIFY TROUBLESHOOTING OF DTC P0069 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Clear the DTC from the memory using the M-MDS.</li> <li>Start the engine.</li> </ul>	Yes Replace the PCM, then go to the next step.  (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)	
		No	Go to the next step.

	<ul style="list-style-type: none"><li>Is the same DTC present?</li></ul>		
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>Perform the "AFTER REPAIR PROCEDURE".</li></ul> (See <b>AFTER REPAIR PROCEDURE [LF]</b> .)	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	DTC troubleshooting completed.
	<ul style="list-style-type: none"><li>Are any DTCs present?</li></ul>		

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### DTC P0101 [LF]

DTC P0101	MAF sensor circuit range/performance problem
DETECTION CONDITION	<ul style="list-style-type: none"><li>PCM monitors mass intake air flow amount when the engine is running.<ul style="list-style-type: none"><li>If the mass intake air flow amount is <b>above 37 l/s</b> for 5 s and the engine speed is below 2,000 rpm with the engine running, the PCM determines that the detected mass intake air flow amount is too high.</li><li>If the mass intake air flow amount is <b>below 4.4—59 l/s</b> (The value depends on engine speed.) for 5 s and the engine speed is <b>above 1,000 rpm</b> with the engine running and the throttle opening angle <b>above 50 %</b>, the PCM determines that detected the mass intake air flow amount is too low.</li></ul></li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>This is a continuous monitor (CCM).</li><li>The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>MAF sensor malfunction</li><li>Electrical corrosion in MAF RETURN circuit</li><li>Voltage drops in ground circuit</li></ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	VERIFY FREEZE FRAME DATA HAS BEEN RECORDED	YesGo to the next step.

	<ul style="list-style-type: none"><li>Has FREEZE FRAME DATA been recorded?</li></ul>	No	Record the FREEZE FRAME on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"><li>Verify related Service Bulletins and/or on-line repair information availability.</li><li>Is any related repair information available?</li></ul>	Yes	Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"><li>If the vehicle is not repaired, go to the next step.</li></ul>
		No	Go to the next step.
3	<b>VERIFY CURRENT INPUT SIGNAL STATUS IS CONCERN INTERMITTENT OR CONSTANT</b> <ul style="list-style-type: none"><li>Connect the M-MDS to DLC-2.</li><li>Start the engine.</li><li>Access ECT, MAF, TP and RPM PIDs using the M-MDS.</li><li>Warm-up engine until ECT PID is <b>above -200 °C {-392 °F}</b>.</li><li>Idle engine for <b>5 s or more</b>.</li></ul> <b>CAUTION:</b> <ul style="list-style-type: none"><li>While driving, always operate the vehicle in a safe and lawful manner.</li><li>Drive the vehicle under the following two conditions:<ul style="list-style-type: none"><li><b>Condition 1</b><ul style="list-style-type: none"><li>TP PID: <b>50—87.5 %</b></li><li>RPM PID: <b>above 500 rpm</b></li><li>4th gear (MT), D range (AT)</li></ul></li><li><b>Condition 2</b><ul style="list-style-type: none"><li>TP PID: <b>above 80 %</b></li><li>RPM PID: <b>below 2,000 rpm</b></li><li>Gear in</li></ul></li></ul></li><li>Is PENDING CODE for this DTC present?</li></ul>	Yes	Go to the next step.
		No	Intermittent concern exists. Go to the INTERMITTENT CONCERNS TROUBLESHOOTING procedure.  (See <b>INTERMITTENT CONCERN TROUBLESHOOTING [LF]</b> )
	<b>CHECK MAF SENSOR TERMINALS FOR</b>		

4	<b>ELECTRICAL CORROSION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to off.</li> <li>• Disconnect MAF sensor connector.</li> <li>• Check for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>• Is any problem corrosion found?</li> </ul>	<div> YesRepair or replace the suspected terminal or MAF sensor, then go to Step 6.   (See <a href="#">MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION [LF]</a>.) </div> <div> NoGo to the next step. </div>
5	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Disconnect the PCM connector.</li> <li>• Inspect for poor connection (such as damaged/ pulled-out pins, corrosion.).</li> <li>• Is there any malfunction?</li> </ul>	<div> YesRepair terminal, then go to the next step. </div> <div> NoGo to the next step. </div>
6	<b>VERIFY TROUBLESHOOTING OF DTC P0101 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to connect all disconnected connectors.</li> <li>• Turn the ignition switch to ON position (Engine off).</li> <li>• Clear the DTC from PCM memory using the M-MDS.</li> <li>• Start the engine.</li> <li>• Warm-up engine until ECT PID is <b>above –200 °C {–392 °F}</b>.</li> <li>• Idle engine for <b>5 s or more</b>.</li> </ul> <p><b>CAUTION:</b></p> <ul style="list-style-type: none"> <li>• While performing the Drive Mode, always operate the vehicle in a safe and lawful manner.</li> <li>• Drive the vehicle under the following two conditions: <div> <div><b>Condition 1</b></div> <ul style="list-style-type: none"> <li>▪ TP PID: <b>50—87.5 %</b></li> <li>▪ RPM PID: <b>above 500 rpm</b></li> <li>▪ 4th gear (MT), D range (AT)</li> </ul> <div><b>Condition 2</b></div> </div> </li> </ul>	<div> YesReplace the PCM, then go to the next step.   (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a>.) </div> <div> NoGo to the next step. </div>

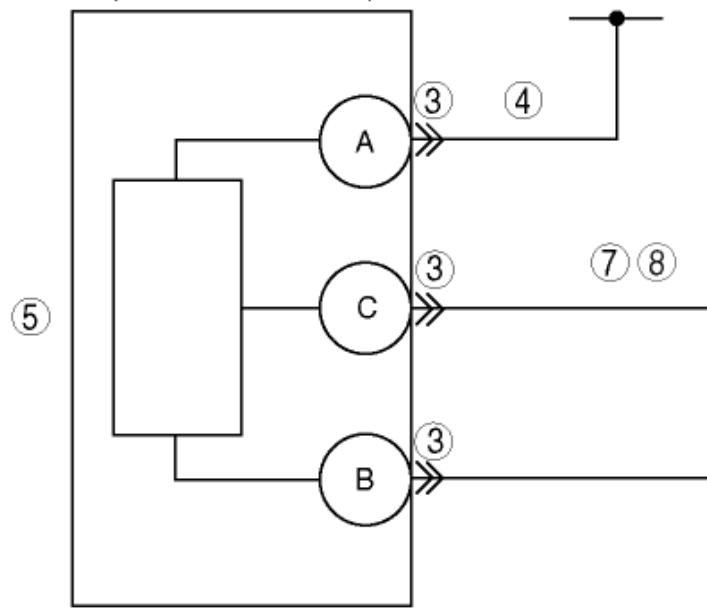
	<ul style="list-style-type: none"> <li>▪ TP PID: <b>above 80 %</b></li> <li>▪ RPM PID: <b>below 2,000 rpm</b></li> <li>▪ Gear in</li> </ul> <ul style="list-style-type: none"> <li>• Is PENDING CODE for this the DTC present?</li> </ul>		
7	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform the "After Repair Procedure". (See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</li> <li>• Is any DTC present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.

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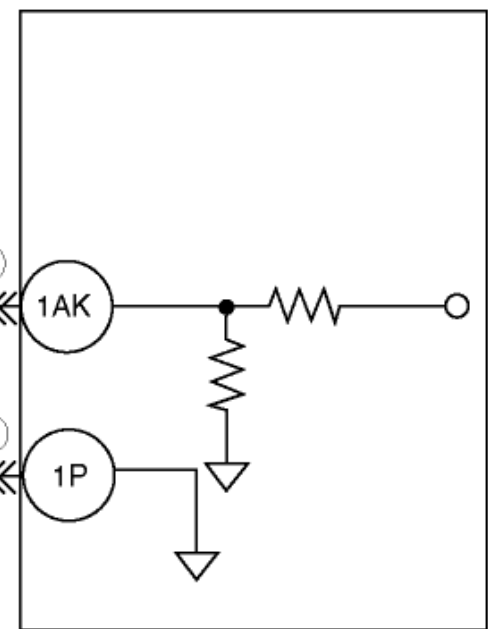
DTC P0102 [LF]

DTC P0102	MAF sensor circuit low input
DETECTION CONDITION	<ul style="list-style-type: none"><li>The PCM monitors input voltage from the MAF sensor when the engine running. If the input voltage is <b>below 0.21 V</b>, the PCM determines that the MAF circuit has a malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>This is a continuous monitor (CCM).</li><li>The MIL illuminates if the PCM detects the above malfunction condition during first drive cycle.</li><li>PENDING CODE is available if the PCM detects the above malfunction condition.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>MAF sensor malfunction</li><li>Connector or terminal malfunction</li><li>Short to ground in wiring harness between MAF/IAT sensor terminal C and PCM terminal 1AK</li><li>Open circuit in wiring harness between MAF/IAT sensor terminal C and PCM terminal 1AK</li><li>Open circuit in wiring harness between main relay and MAF/IAT sensor terminal A</li><li>PCM malfunction</li></ul>

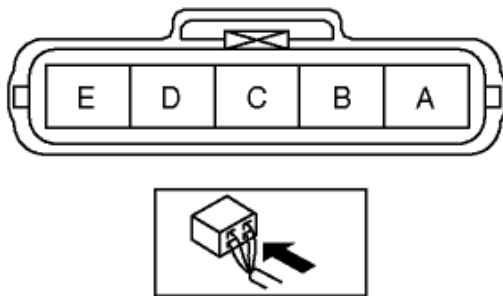
# MAF SENSOR (MAF/IAT SENSOR)



# PCM

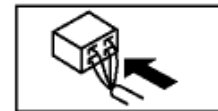


## MAF/IAT SENSOR WIRING HARNESS-SIDE CONNECTOR



## PCM WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Record the FREEZE FRAME DATA on the repair order, then go to the next step.</p>
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	<p>Yes Perform repair or diagnosis according to the available repair information.</p> <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> <p>No Go to the next step.</p>
3	<b>INSPECT MAF/IAT SENSOR CONNECTOR FOR POOR CONNECTION</b>	<p>Yes Repair or replace the terminals, then go to</p>



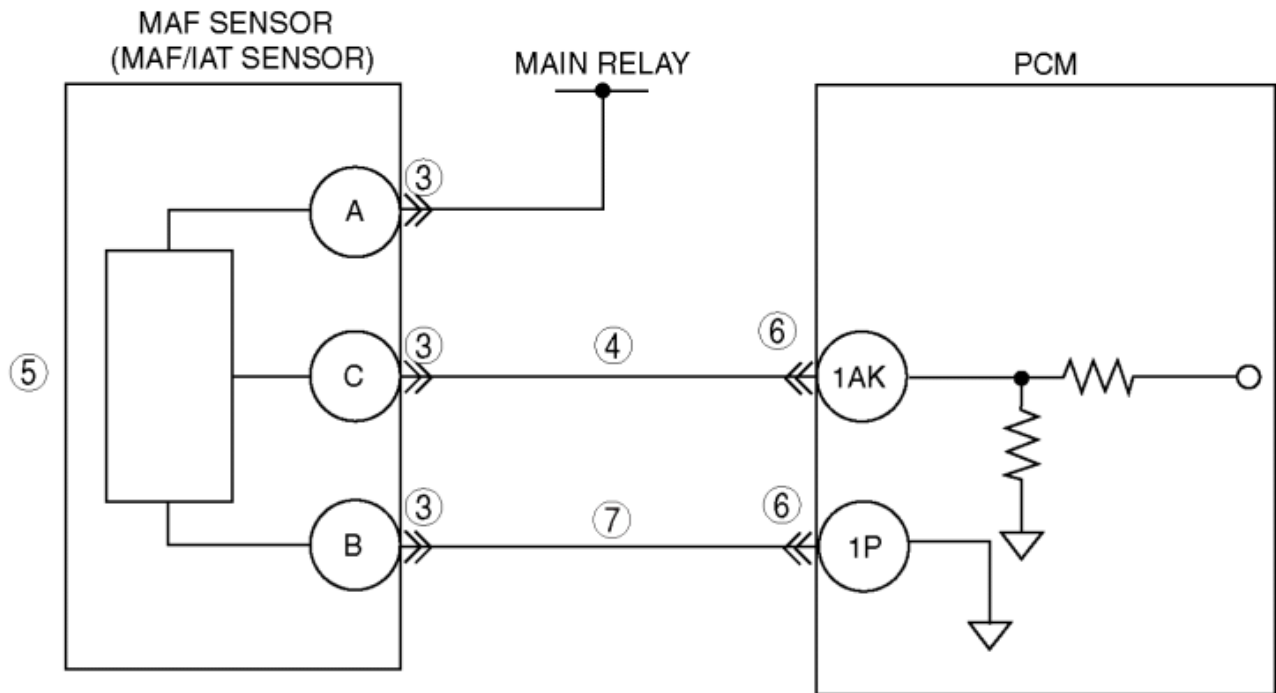
	<ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the MAF/IAT sensor connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Step 9.	
		No	Go to the next step.
4	<b>INSPECT POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position. (Engine off)</li> <li>• Inspect voltage at the MAF/IAT sensor terminal A (wiring harness-side).</li> <li>• Is the voltage <b>B+</b>?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible an open circuit, then go to Step 9.
5	<b>INSPECT MAF SENSOR</b> <ul style="list-style-type: none"> <li>• Inspect the MAF sensor.</li> </ul> <p>(See <b>MASS AIR FLOW (MAF) SENSOR INSPECTION [LF].</b>)</p> <ul style="list-style-type: none"> <li>• Is there any malfunction?</li> </ul>	Yes	Replace the MAF/IAT sensor, then go to Step 9.
			(See <b>MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION [LF].</b> )
		No	Go to the next step.
6	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the PCM connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair the terminal, then go to Step 9.
		No	Go to the next step.
7	<b>INSPECT MAF SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Remove the PCM with the PCM connector connected.</li> <li>• Inspect for continuity between MAF/IAT sensor terminal C (wiring harness-side) and PCM terminal 1AK (wiring harness-side).</li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 9.
8	<b>INSPECT MAF SENSOR SIGNAL CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between MAF/IAT sensor terminal C (wiring harness-side) and body ground.</li> <li>• Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness, then go to the next step.
		No	Go to the next step.
9	<b>VERIFY TROUBLESHOOTING OF DTC P0102 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Clear the DTC from the memory using the M-MDS.</li> </ul>	Yes	Replace the PCM, then go to the next step.
			(See <b>PCM REMOVAL/INSTALLATION [LF].</b> )
		No	Go to the next step.

	<ul style="list-style-type: none"><li>• Start the engine.</li><li>• Is the same DTC present?</li></ul>		
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the “AFTER REPAIR PROCEDURE”. (See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</li><li>• Are any DTC present?</li></ul>	Yes	Go to the applicable DTC troubleshooting. (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.

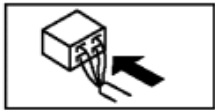
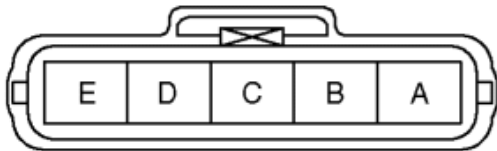
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DTC P0103 [LF]

DTC P0103	MAF sensor circuit high input
DETECTION CONDITION	<ul style="list-style-type: none"><li>The PCM monitors the input voltage from the MAF sensor when the engine running. If the input voltage is <b>above 4.9 V</b>, the PCM determines that the MAF circuit has a malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>This is a continuous monitor (CCM).</li><li>The MIL illuminates if the PCM detects the above malfunction condition during first drive cycle.</li><li>PENDING CODE is available if the PCM detects the above malfunction condition.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>MAF sensor malfunction</li><li>Connector or terminal malfunction</li><li>Short to power supply in wiring harness between MAF/IAT sensor terminal C and PCM terminal 1AK</li><li>Open circuit in wiring harness between MAF/IAT sensor terminal B and PCM terminal 1P</li><li>PCM malfunction</li></ul>

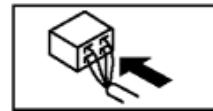


MAF/IAT SENSOR  
WIRING HARNESS-SIDE CONNECTOR



PCM  
WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step. No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> No Go to the next step.
3	<b>INSPECT MAF/IAT SENSOR CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> </ul>	Yes Repair or replace the terminals, then go to Step 8.

	<ul style="list-style-type: none"> <li>• Disconnect the MAF/IAT sensor connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	No	Go to the next step.
4	<b>INSPECT MAF SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position. (Engine off)</li> <li>• Measure the voltage between MAF/IAT sensor terminal C (wiring harness-side) and body ground.</li> <li>• Is the voltage <b>B+</b>?</li> </ul>	Yes	Repair or replace the wiring harness, then go to Step 8.
		No	Go to the next step.
5	<b>INSPECT MAF SENSOR</b> <ul style="list-style-type: none"> <li>• Inspect the MAF sensor. (See <a href="#">MASS AIR FLOW (MAF) SENSOR INSPECTION [LF].</a>)</li> <li>• Is there any malfunction?</li> </ul>	Yes	Replace the MAF/IAT sensor, then go to Step 8. (See <a href="#">MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION [LF].</a> )
		No	Go to the next step.
6	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the PCM connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair the terminal, then go to Step 8.
		No	Go to the next step.
7	<b>INSPECT MAF SENSOR GROUND FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Remove the PCM with the PCM connector connected.</li> <li>• Inspect for continuity between MAF/IAT sensor terminal B (wiring harness-side) and body ground.</li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to the next step.
8	<b>VERIFY TROUBLESHOOTING OF DTC P0103 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all the disconnected connectors.</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Start the engine.</li> <li>• Is the same DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step. (See <a href="#">PCM REMOVAL/INSTALLATION [LF].</a> )
		No	Go to the next step.
9	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform the "AFTER REPAIR PROCEDURE". (See <a href="#">AFTER REPAIR PROCEDURE [LF].</a>)</li> </ul>	Yes	Go to the applicable DTC troubleshooting. (See <a href="#">DTC TABLE [LF].</a> )

	• Are any DTCs present?	No	Troubleshooting completed.
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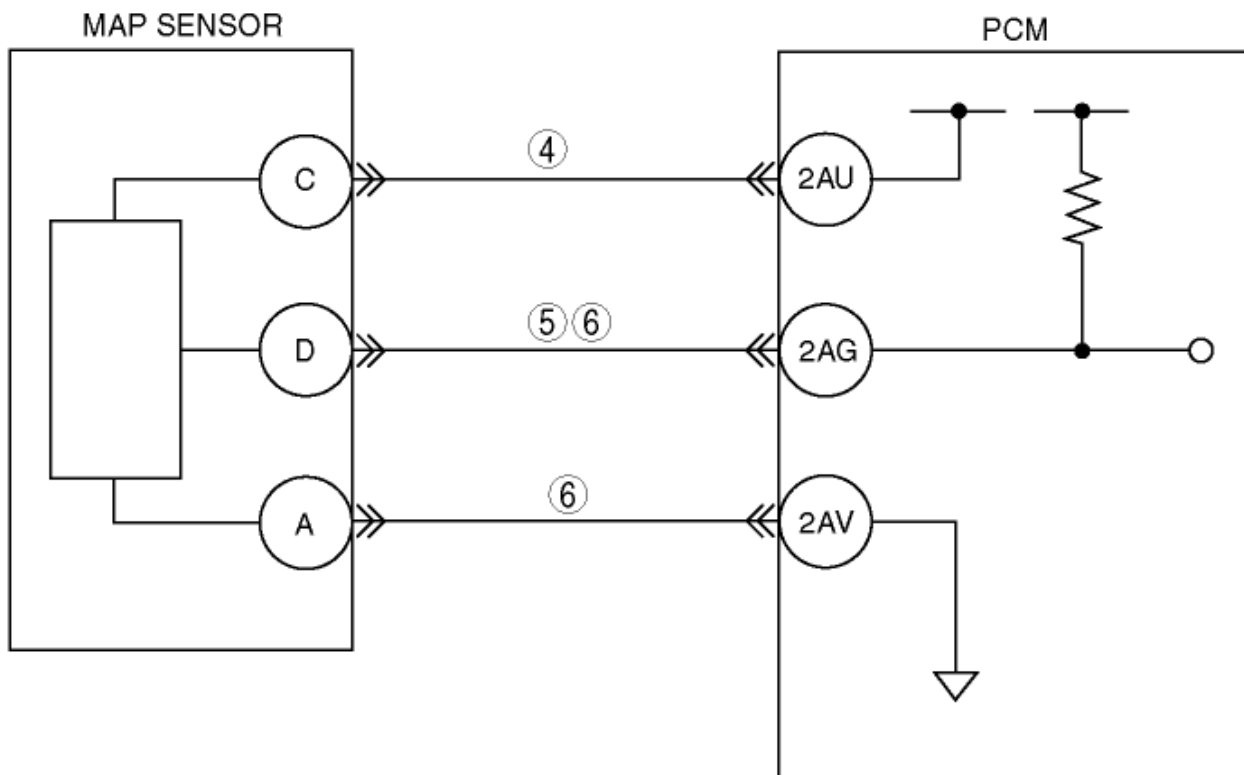
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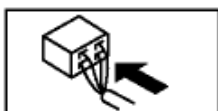
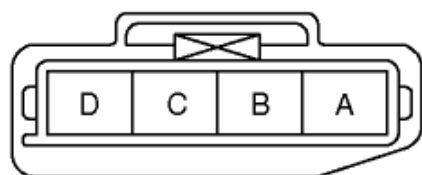
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DTC P0107 [LF]

DTC P0107	MAP sensor circuit low input
DETECTION CONDITION	<div><ul style="list-style-type: none"><li>The PCM monitors the input voltage from the MAP sensor when intake air temperature is <b>above <math>-10\text{ }^{\circ}\text{C}</math> {14 }^{\circ}\text{F}</b>. If the input voltage is <b>below 0.1 V</b>, the PCM determines that the MAP sensor circuit has a malfunction.</li></ul><div>MONITORING CONDITIONS<ul style="list-style-type: none"><li>Calculated load: <b>13—32 %</b></li></ul></div><div>Diagnostic support note<ul style="list-style-type: none"><li>This is a continuous monitor (CCM).</li><li>The MIL illuminates if the PCM detects the above malfunction condition during first drive cycle.</li><li>PENDING CODE is available if the PCM detects the above malfunction condition.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul></div></div>
POSSIBLE CAUSE	<div><ul style="list-style-type: none"><li>MAP sensor malfunction</li><li>Connector or terminal malfunction</li><li>Short to ground in wiring harness between MAP sensor terminal D and PCM terminal 2AG</li><li>MAP sensor signal circuit and MAP sensor ground circuit are shorted each other</li><li>Open circuit in wiring harness between MAP sensor terminal C and PCM terminal 2AU</li><li>PCM malfunction</li></ul></div>

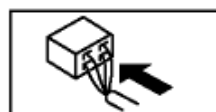


**MAP SENSOR  
WIRING HARNESS-SIDE CONNECTOR**



**PCM  
WIRING HARNESS-SIDE CONNECTOR**

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair</li> </ul>	Yes Perform repair or diagnosis according to the available repair information.
		<ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>



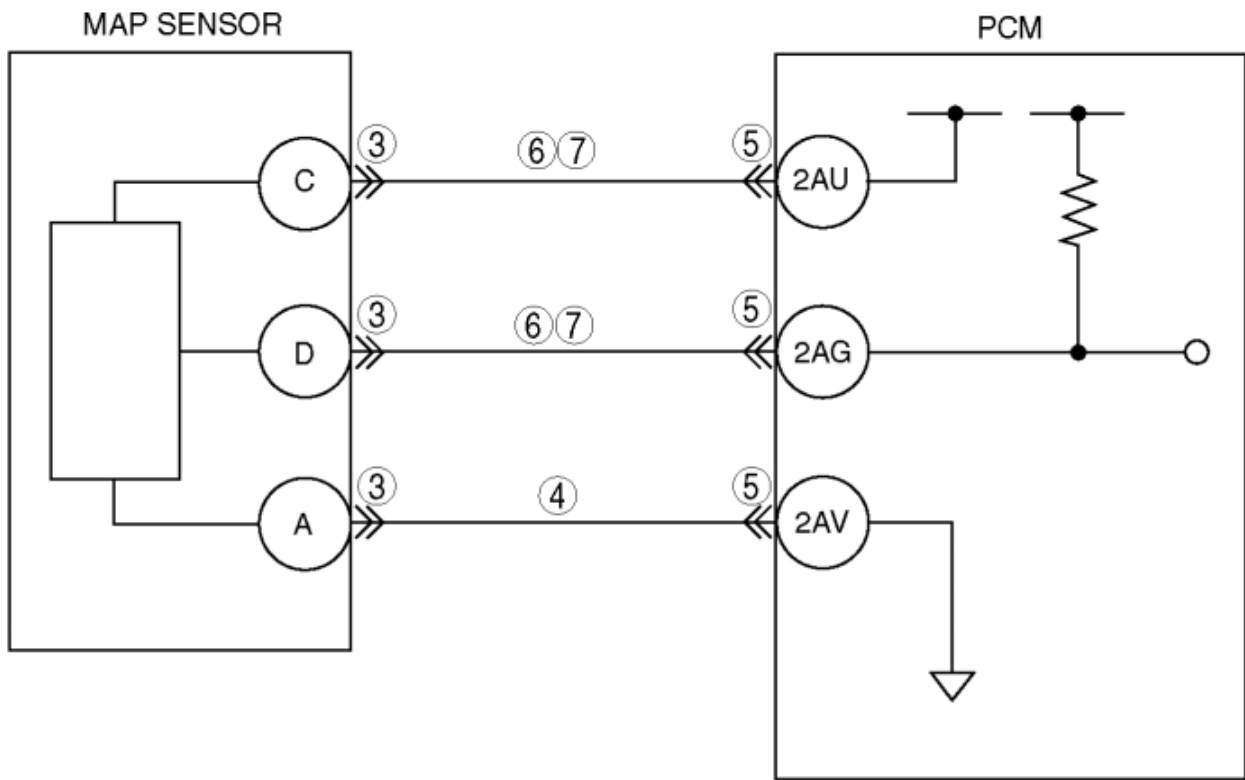
	information available?	No	Go to the next step.
3	<b>VERIFY MAP PID WHEN MAP SENSOR CONNECTOR IS DISCONNECTED</b> <ul style="list-style-type: none"> <li>• Connect the M-MDS to DLC-2.</li> <li>• Access MAP PID.</li> <li>• Disconnect the MAP sensor connector.</li> <li>• Is the voltage <b>above 4.9 V</b>?</li> </ul>	Yes	Go to the next step.
		No	Go to Step 5.
4	<b>INSPECT POWER SUPPLY CIRCUIT VOLTAGE AT MAP SENSOR CONNECTOR</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position (Engine off).</li> <li>• Measure the voltage between MAP sensor terminal C (wiring harness-side) and body ground.</li> <li>• Is the voltage <b>within 4.5— 5.5 V</b>?</li> </ul>	Yes	Inspect for poor connection at MAP sensor terminal C (wiring harness-side). <ul style="list-style-type: none"> <li>• Repair or replace the terminal if necessary.</li> <li>• If there is no malfunction, replace the MAP sensor.</li> </ul> (See <b>MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR REMOVAL/INSTALLATION [LF]</b> .)  Then go to Step 7.
		No	Inspect for open circuit in the wiring harness between PCM terminal 2AU (wiring harness-side) and MAP sensor terminal C (wiring harness-side).  Repair or replace the suspected wiring harness, then go to Step 7.
5	<b>INSPECT MAP SENSOR SIGNAL CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the PCM connector.</li> <li>• Inspect for continuity between MAP sensor terminal D (wiring harness-side) and body ground.</li> <li>• Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness, then go to Step 7.
		No	Go to the next step.
6	<b>INSPECT MAP SENSOR SIGNAL AND GROUND CIRCUIT FOR SHORT EACH OTHER</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between MAP sensor terminals D and A (wiring harness-side).</li> <li>• Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness, then go to the next step.
		No	Go to the next step.
7	<b>VERIFY TROUBLESHOOTING OF DTC P0107 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Turn the ignition switch to the ON position. (Engine off)</li> <li>• Clear the DTC from the</li> </ul>	Yes	Replace the PCM, then go to the next step.  (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)
		No	Go to the next step.

	memory using the M-MDS. <ul style="list-style-type: none"><li>• Start the engine.</li><li>• Is the same DTC present?</li></ul>		
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "AFTER REPAIR PROCEDURE".</li></ul> (See <b>AFTER REPAIR PROCEDURE [LF]</b> .)	Yes	Go to the applicable DTC troubleshooting. (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.
	<ul style="list-style-type: none"><li>• Are any DTC present?</li></ul>		

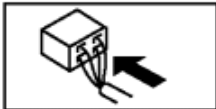
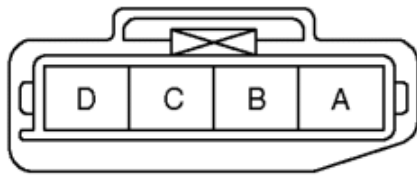
2008 - MX-5 - Engine

DTC P0108 [LF]

DTC P0108	MAP sensor circuit high input
DETECTION CONDITION	<div><ul style="list-style-type: none"><li>The PCM monitors the input voltage from the MAP sensor when intake air temperature is <b>above <math>-10\text{ }^{\circ}\text{C}</math> { <math>14\text{ }^{\circ}\text{F}</math> }</b>. If input the voltage is <b>above 4.92 V</b>, the PCM determines that the MAP sensor circuit has a malfunction.</li></ul></div> <div>MONITORING CONDITIONS</div> <div><ul style="list-style-type: none"><li>Calculated load: <b>13—32 %</b></li></ul></div> <div>Diagnostic support note</div> <div><ul style="list-style-type: none"><li>This is a continuous monitor (CCM).</li><li>The MIL illuminates if the PCM detects the above malfunction condition during first drive cycle.</li><li>PENDING CODE is available if the PCM detects the above malfunction condition.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul></div>
POSSIBLE CAUSE	<div><ul style="list-style-type: none"><li>MAP sensor malfunction</li><li>Connector or terminal malfunction</li><li>Open circuit in wiring harness between MAP sensor terminal A and PCM terminal 2AV</li><li>Open circuit in wiring harness between MAP sensor terminal D and PCM terminal 2AG</li><li>MAP sensor signal circuit shorts to constant voltage supply circuit</li><li>PCM malfunction</li></ul></div>

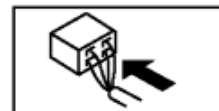


MAP SENSOR  
WIRING HARNESS-SIDE CONNECTOR



PCM  
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b>	Yes Perform repair or diagnosis according to the available repair information.
	<ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	<ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> No Go to the next step.

3	<b>INSPECT MAP SENSOR CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Disconnect the MAP sensor connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	<b>VERIFY MAP SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between the MAP sensor terminal A (wiring harness-side) and body ground.</li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Inspect for open circuit in the wiring harness between PCM terminal 2AV (wiring harness-side) and MAP sensor terminal A (wiring harness-side).  Repair or replace suspected harness, then go to Step 8.
5	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Disconnect the PCM connector.</li> <li>• Inspect for poor connection at terminals (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair the terminal, then go to Step 8.
		No	Go to the next step.
6	<b>VERIFY MAP SENSOR SIGNAL CIRCUIT FOR SHORT TO CONSTANT VOLTAGE CIRCUIT</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between MAP sensor terminal D and C (wiring harness-side).</li> <li>• Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness, then go to Step 8.
		No	Go to the next step.
7	<b>VERIFY MAP SENSOR CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between the following:               <ul style="list-style-type: none"> <li>▪ MAP sensor terminal D (wiring harness-side) and PCM terminal 2AG (wiring harness-side)</li> <li>▪ MAP sensor terminal C (wiring harness-side) and PCM terminal 2AU (wiring harness-side)</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to the next step.
8	<b>VERIFY TROUBLESHOOTING OF DTC P0108 COMPLETED</b>	Yes	Replace the PCM, then go to the next step.

	<ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Turn the ignition switch to the ON position (Engine off).</li><li>• Clear the DTC from the memory using the M-MDS.</li><li>• Start the engine.</li><li>• Is the same DTC present?</li></ul>		(See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
9	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "AFTER REPAIR PROCEDURE".</li></ul> (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a> .)	Yes	Go to the applicable DTC troubleshooting. (See <a href="#">DTC TABLE [LF]</a> .)
	<ul style="list-style-type: none"><li>• Are any DTC present?</li></ul>	No	Troubleshooting completed.

## 2008 - MX-5 - Engine

### DTC P0111 [LF]

DTC P0111	IAT sensor circuit range/performance problem
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>If intake air temperature is higher than engine coolant temperature by <b>18 °C {32.4 °F} for 1.2 s</b> with ignition switch on*, the PCM determines that there is a intake air temperature sensor circuit range/performance problem.</li> <li>*: Ignition switch on when <b>6 h</b> or more has passed since the previous ignition switch off</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>IAT sensor malfunction</li> <li>Connector or terminal malfunction</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b>	Yes Perform repair or diagnosis according to the available repair information.

	<p>Verify related Service Bulletins and/or on-line repair information availability.</p> <ul style="list-style-type: none"> <li>Is any related repair information available?</li> </ul>		<ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<p><b>INSPECT MAF/IAT SENSOR CONNECTOR FOR POOR CONNECTION</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the MAF/IAT sensor connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 6.
		No	Go to the next step.
4	<p><b>INSPECT IAT SENSOR</b></p> <ul style="list-style-type: none"> <li>Inspect the IAT sensor. (See <a href="#">INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION [LF]</a>.)</li> <li>Is the IAT sensor normal?</li> </ul>	Yes	<p>Replace the MAF/IAT sensor, then go to Step 6.</p> <p>(See <a href="#">MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION [LF]</a>.)</p>
		No	Go to the next step.
5	<p><b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b></p> <ul style="list-style-type: none"> <li>Disconnect the PCM connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
6	<p><b>VERIFY TROUBLESHOOTING OF DTC P0111 COMPLETED</b></p> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Start the engine and run the engine under FREEZE FRAME DATA condition.</li> <li>Is the PENDING CODE for this DTC present?</li> </ul>	Yes	<p>Replace the PCM, then go to the next step.</p> <p>(See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a>.)</p>
		No	Go to the next step.
7	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"> <li>Perform the "AFTER REPAIR</li> </ul>	Yes	<p>Go to the applicable DTC troubleshooting.</p> <p>(See <a href="#">DTC TABLE [LF]</a>.)</p>

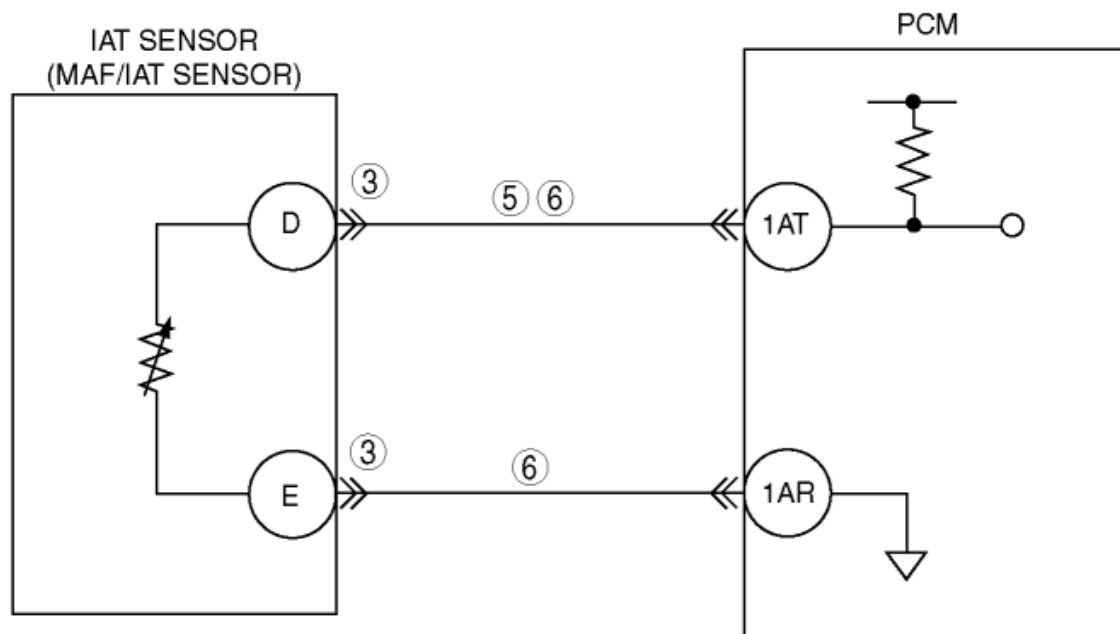


	PROCEDURE".		
	(See <b>AFTER REPAIR PROCEDURE [LF]</b> .)		No Troubleshooting completed.
	<ul style="list-style-type: none"><li>• Are any DTC present?</li></ul>		

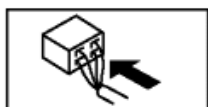
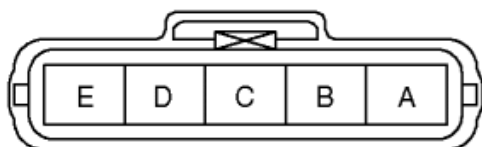
2008 - MX-5 - Engine

DTC P0112 [LF]

DTC P0112	IAT sensor circuit low input
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors the IAT sensor signal. If the PCM detects that the IAT sensor voltage is <b>below 0.16 V</b>, the PCM determines that the IAT sensor circuit has a malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (CCM).</li><li>• The MIL illuminates if the PCM detects the above malfunction condition during first drive cycle.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• IAT sensor malfunction</li><li>• Connector or terminal malfunction</li><li>• Short to ground in wiring harness between MAF/IAT sensor terminal D and PCM terminal 1AT</li><li>• IAT sensor signal circuit and IAT sensor ground circuit are shorted each other</li><li>• PCM malfunction</li></ul>

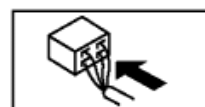


MAF/IAT SENSOR  
WIRING HARNESS-SIDE CONNECTOR



PCM  
WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



## Diagnostic procedure

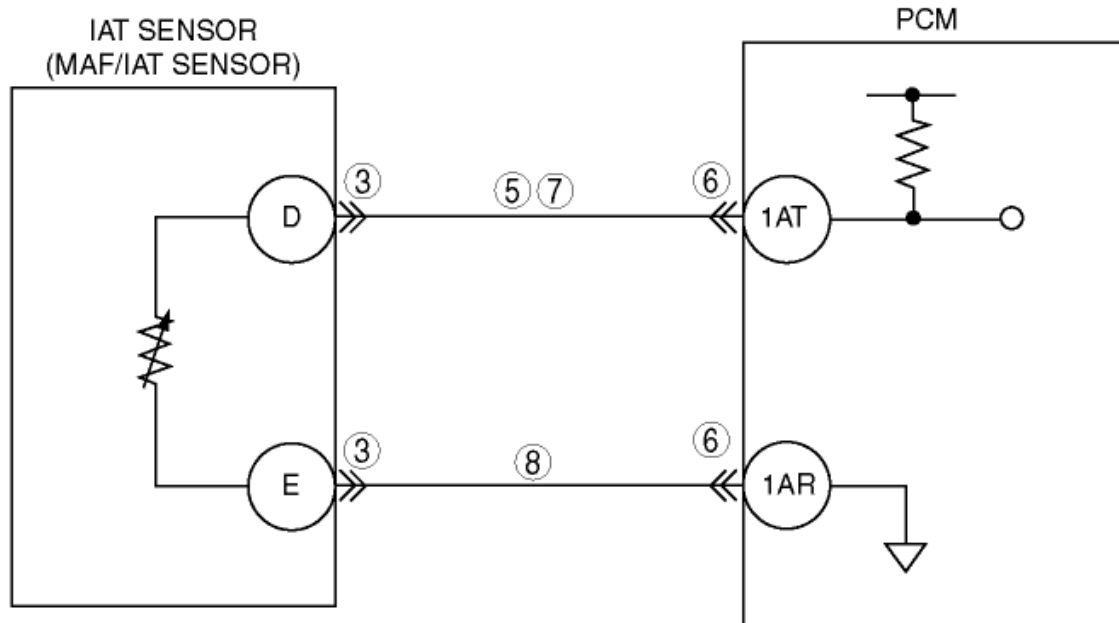
STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.  No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> No Go to the next step.
3	<b>INSPECT IAT SENSOR TERMINAL</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the MAF/IAT sensor connector.</li> <li>Inspect for bent terminal of MAF/IAT sensor terminals D and E (part-side).</li> </ul>	Yes Repair or replace the terminal, then go to Step 7.  No Go to the next step.

	<ul style="list-style-type: none"> <li>Is there any malfunction?</li> </ul>		
4	<b>CLASSIFY IAT SENSOR MALFUNCTION OR WIRING HARNESS MALFUNCTION</b> <ul style="list-style-type: none"> <li>Connect the M-MDS to DLC-2.</li> <li>Access IAT PID.</li> <li>Verify IAT value when disconnecting the MAF/IAT sensor connector.</li> <li>Does IAT value change?</li> </ul>	Yes Replace the MAF/IAT sensor, then go to Step 7.  (See <a href="#">MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION [LF]</a> .)	
		No Go to the next step.	
5	<b>INSPECT IAT SENSOR SIGNAL CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the PCM connector.</li> <li>Inspect for continuity between MAF/IAT sensor terminal D (wiring harness-side) and body ground.</li> <li>Is there continuity?</li> </ul>	Yes Repair or replace the wiring harness for a short to ground, then go to Step 7.	
		No Go to the next step.	
6	<b>INSPECT IAT SENSOR SIGNAL AND GROUND CIRCUITS FOR SHORT EACH OTHER</b> <ul style="list-style-type: none"> <li>Inspect for continuity between MAF/IAT sensor terminals D and E (wiring harness-side).</li> <li>Is there continuity?</li> </ul>	Yes Repair or replace the wiring harness for a short, then go to Step 7.	
		No Go to the next step.	
7	<b>VERIFY TROUBLESHOOTING OF DTC P0112 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Start the engine.</li> <li>Is same DTC present?</li> </ul>	Yes Replace the PCM, then go to the next step.  (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)	
		No Go to the next step.	
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the "AFTER REPAIR PROCEDURE". (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</li> <li>Are any DTC present?</li> </ul>	Yes Go to the applicable DTC troubleshooting.  (See <a href="#">DTC TABLE [LF]</a> .)	
		No Troubleshooting completed.	

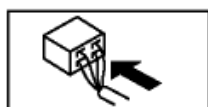
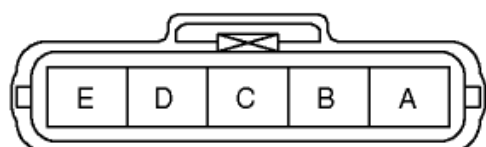
2008 - MX-5 - Engine

DTC P0113 [LF]

DTC P0113	IAT sensor circuit high input
DETECTION CONDITION	<ul style="list-style-type: none"><li>The PCM monitors the IAT sensor signal. If the PCM detects that the IAT sensor voltage is <b>above 4.84 V</b>, the PCM determines that IAT sensor circuit has a malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>This is a continuous monitor (CCM).</li><li>The MIL illuminates if the PCM detects the above malfunction condition during first drive cycle.</li><li>PENDING CODE is available if the PCM detects the above malfunction condition.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>IAT sensor malfunction</li><li>Connector or terminal malfunction</li><li>Open circuit in wiring harness between MAF/IAT sensor terminal D and PCM terminal 1AT</li><li>Short to power supply in wiring harness between MAF/IAT sensor terminal D and PCM terminal 1AT</li><li>Open circuit in wiring harness between MAF/IAT sensor terminal E and PCM terminal 1AR</li><li>PCM malfunction</li></ul>

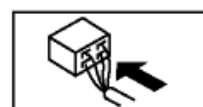


MAF/IAT SENSOR  
WIRING HARNESS-SIDE CONNECTOR



PCM  
WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.  No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> No Go to the next step.
3	<b>INSPECT IAT SENSOR CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the MAF/IAT sensor connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> </ul>	Yes Repair or replace the replace the wiring terminal, then go to Step 9.  No Go to the next step.

	<ul style="list-style-type: none"> <li>Is there any malfunction?</li> </ul>		
4	<b>CLASSIFY IAT SENSOR MALFUNCTION OR WIRING HARNESS MALFUNCTION</b> <ul style="list-style-type: none"> <li>Connect the M-MDS to DLC-2.</li> <li>Access IAT PID.</li> <li>Connect a jumper wire between MAF/IAT sensor terminals D and E.</li> <li>Verify IAT value</li> <li>Is the voltage <b>below 4.84 V</b>?</li> </ul>	Yes Replace the MAF/IAT sensor, then go to Step 9.  (See <a href="#">MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION [LF]</a> .)	
		No Go to the next step.	
5	<b>INSPECT IAT SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Measure the voltage between MAF/IAT sensor terminal D (wiring harness-side) and body ground.</li> <li>Is the voltage <b>B+</b>?</li> </ul>	Yes Repair or replace the wiring harness for short to power supply, then go to Step 9.	
		No Go to the next step.	
6	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the PCM connector.</li> <li>Inspect PCM terminals 1AT and 1AR (wiring harness-side) for tightness using feeler tool.</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace the terminal, then go to Step 9.	
		No Go to the next step.	
7	<b>INSPECT IAT SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for continuity between MAF/IAT sensor terminal D (wiring harness-side) and PCM terminal 1AT.</li> <li>Is there continuity?</li> </ul>	Yes Go to the next step.	
		No Repair or replace the wiring harness for open circuit, then go to Step 9.	
8	<b>INSPECT IAT SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for continuity between MAF/IAT sensor terminal E (wiring harness-side) and PCM terminal 1AR.</li> <li>Is there continuity?</li> </ul>	Yes Go to the next step.	
		No Repair or replace the wiring harness for open circuit, then go to the next step.	
9	<b>VERIFY TROUBLESHOOTING OF DTC P0113 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Start the engine.</li> <li>Is the same DTC present?</li> </ul>	Yes Replace the PCM, then go to the next step.  (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)	
		No Go to the next step.	
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the "AFTER REPAIR PROCEDURE".</li> </ul>	Yes Go to the applicable DTC troubleshooting.  (See <a href="#">DTC TABLE [LF]</a> .)	

	(See <b>AFTER REPAIR PROCEDURE [LF]</b> .)	
	<ul style="list-style-type: none"><li>• Are any DTC present?</li></ul>	No Troubleshooting completed.

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## 2008 - MX-5 - Engine

### DTC P0116 [LF]

DTC P0116	Engine coolant temperature circuit range/performance
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors the maximum value and minimum value of engine coolant temperature when the engine is started and <b>5 min</b> have been passed after leaving the vehicle <b>6 h or more</b>. If difference between maximum and minimum values of engine coolant temperature is <b>below 6 °C {10.8 °F}</b> the PCM determines that there is an ECT circuit range/performance problem.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor. (Engine cooling system)</li> <li>The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>ECT sensor malfunction</li> <li>Connector or terminal malfunction</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Engine cooling system related) been recorded?</li> </ul>	No Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b>	Yes Perform repair or diagnosis according to the available repair information.

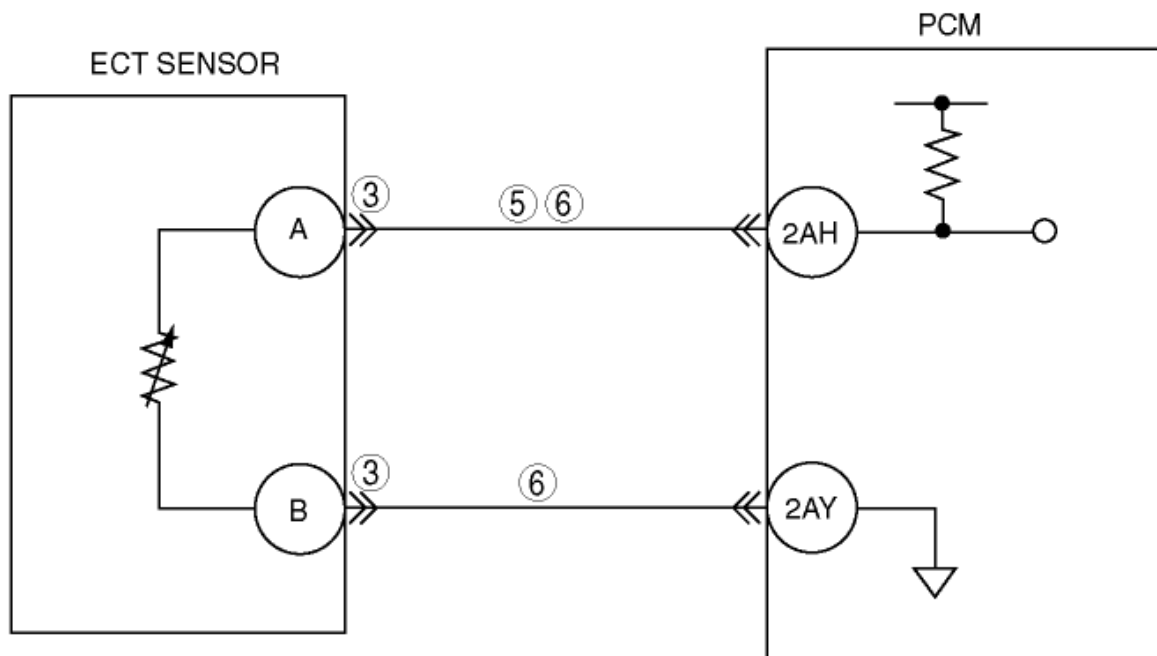
	<ul style="list-style-type: none"> <li>• Verify related Service Bulletins and/or on-line repair information availability.</li> <li>• Is any related repair information available?</li> </ul>		<ul style="list-style-type: none"> <li>• If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<b>INDETIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> <ul style="list-style-type: none"> <li>• Is DTC P0116 on FREEZE FRAME DATA?</li> </ul>	Yes	Go to the next step.
		No	Go to troubleshooting for DTC on FREEZE FRAME DATA.  (See <b>DTC TABLE [LF]</b> .)
4	<b>INSPECT ECT SENSOR CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect ECT sensor connector.</li> <li>• Inspect for poor connection (such as damaged/ pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
5	<b>INSPECT ECT SENSOR</b> <ul style="list-style-type: none"> <li>• Inspect the ECT sensor.  (See <b>ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [LF]</b>.)</li> <li>• Is there any malfunction?</li> </ul>	Yes	Replace the ECT sensor, then go to Step 8.  (See <b>ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [LF]</b> .)
		No	Go to the next step.
6	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the PCM connector.</li> <li>• Inspect for poor connection (such as damaged/ pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	<b>COMPARE ECT PID VALUE</b> <ul style="list-style-type: none"> <li>• Prepare a new ECT sensor.</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Connect the ECT sensor connector to the new ECT sensor without installing to the engine.</li> </ul>	Yes	Go to the next step.
		No	Inspect the thermostat. <ul style="list-style-type: none"> <li>• If the thermostat is normal, go to the next step.</li> <li>• If the thermostat is not</li> </ul>

	<ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position and record the ECT PID value.</li> <li>• Replace the malfunction ECT sensor with new one.</li> </ul> <p>(See <b>ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>• Start the engine and wait for 5 min.</li> <li>• Is the difference between ECT PID values <b>more than 6 °C {10.8 °F}</b></li> </ul>		normal, then go to the next step.
8	<b>VERIFY TROUBLESHOOTING OF DTC P0116 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Clear DTC from PCM memory using M-MDS.</li> <li>• Start the engine and warm it up to completely.</li> <li>• Is the PENDING CODE same DTC present?</li> </ul>	Yes	Replace PCM, then go to next step. (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)
		No	Go to next step.
9	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform "After Repair Procedure".</li> </ul> <p>(See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</p> <ul style="list-style-type: none"> <li>• Is there any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)
		No	Troubleshooting completed.

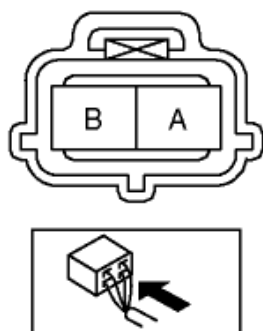
2008 - MX-5 - Engine

DTC P0117 [LF]

DTC P0117	ECT sensor circuit low input
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors the ECT sensor signal at PCM terminal 2AH. If the PCM detects the ECT sensor voltage <b>below 0.2 V</b>, the PCM determines that the ECT sensor circuit has malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (Engine cooling system).</li><li>• The MIL illuminates if the PCM detects the above malfunction condition during first drive cycle.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• ECT sensor malfunction</li><li>• Connect or terminal malfunction</li><li>• Short to ground in wiring harness between ECT sensor terminal A and PCM terminal 2AH</li><li>• Short each wiring harness ECT sensor signal circuit and ECT sensor ground circuit</li><li>• PCM malfunction</li></ul>

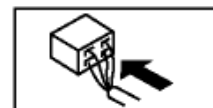


ECT SENSOR  
WIRING HARNESS-SIDE CONNECTOR



PCM  
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



## Diagnostic procedure

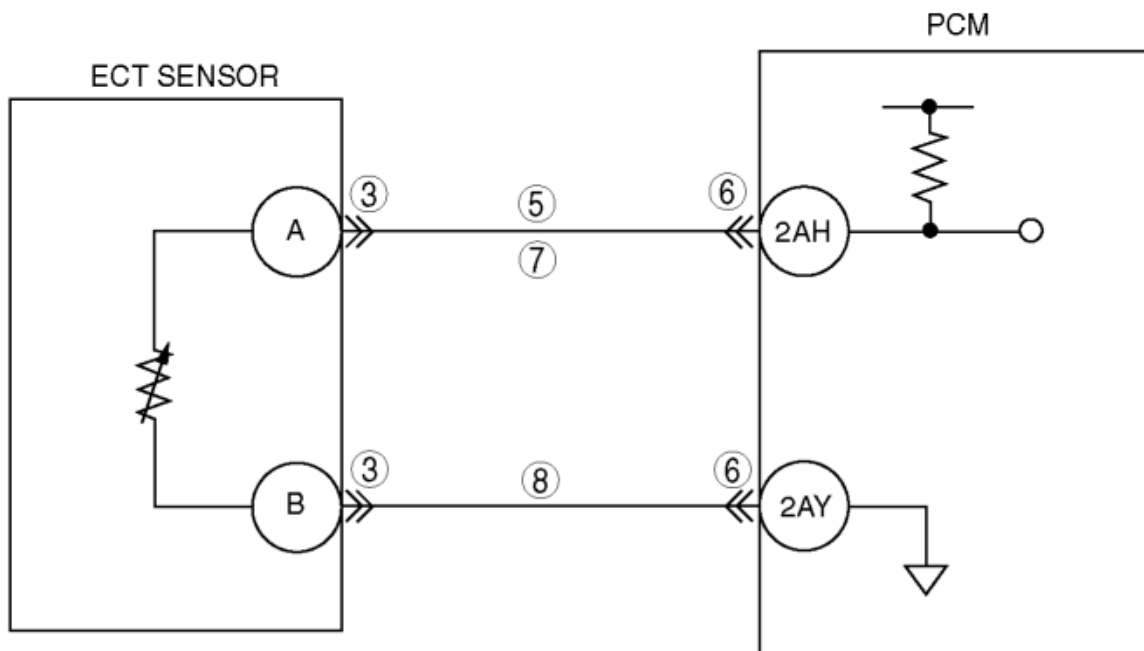
STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Engine cooling system related) been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>INSPECT TERMINAL BENT</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the ECT sensor connector.</li> </ul>	Yes Repair or replace the terminal, then go to Step 7.
		No Go to the next step.

	<ul style="list-style-type: none"> <li>Inspect for bent of ECT sensor terminals A and B (part-side).</li> <li>Is there any malfunction?</li> </ul>		
4	<b>CLASSIFY ECT SENSOR MALFUNCTION OR WIRING HARNESS MALFUNCTION</b> <ul style="list-style-type: none"> <li>Connect the M-MDS to DLC-2.</li> <li>Access ECT PID.</li> <li>Verify ECT value when disconnecting ECT sensor connector.</li> <li>Does the ECT value change?</li> </ul>	Yes	Replace the ECT sensor, then go to Step 7. (See <a href="#">ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
5	<b>INSPECT ECT SENSOR SIGNAL CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Inspect for continuity between ECT sensor terminal A (wiring harness-side) and body ground.</li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness for short to ground, then go to Step 7.
		No	Go to the next step.
6	<b>INSPECT ECT SENSOR CIRCUIT FOR SHORT WIRING HARNESES</b> <ul style="list-style-type: none"> <li>Inspect for continuity between ECT sensor terminal A and B (wiring harness-side).</li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness for short, then go to the next step.
		No	Go to the next step.
7	<b>VERIFY TROUBLESHOOTING OF DTC P0117 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Start the engine, or perform the KOEO self-test with M-MDS. (See <a href="#">KOEO/KOER SELF TEST [LF]</a>.)</li> <li>Is the same DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step. (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the "AFTER REPAIR PROCEDURE". (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</li> <li>Are any DTC present?</li> </ul>	Yes	Go to the applicable DTC troubleshooting. (See <a href="#">DTC TABLE [LF]</a> .)
		No	Troubleshooting completed.

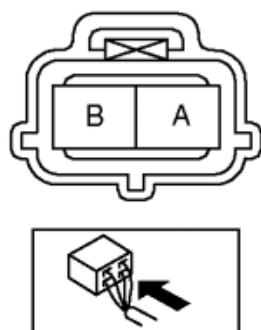
2008 - MX-5 - Engine

DTC P0118 [LF]

DTC P0118	ECT sensor circuit high input
DETECTION CONDITION	<ul style="list-style-type: none"><li>The PCM monitors the ECT sensor signal at PCM terminal 2AH. If the PCM detects the ECT sensor voltage is <b>above 4.58 V</b>, the PCM determines that the ECT sensor circuit has malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>This is a continuous monitor (Engine cooling system).</li><li>The MIL illuminates if the PCM detects the above malfunction condition during first drive cycle.</li><li>PENDING CODE is available if the PCM detects the above malfunction condition.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>ECT sensor malfunction</li><li>Connect or terminal malfunction</li><li>Open circuit in wiring harness between ECT sensor terminal A and PCM terminal 2AH</li><li>Short to power supply in wiring harness between ECT sensor terminal A and PCM terminal 2AH</li><li>Open circuit in wiring harness between ECT sensor terminal B and PCM terminal 2AY</li><li>PCM malfunction</li></ul>

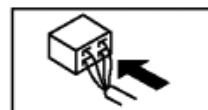


ECT SENSOR  
WIRING HARNESS-SIDE CONNECTOR



PCM  
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Engine cooling system related) been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>INSPECT POOR CONNECTION OF ECT SENSOR CONNECTOR</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> </ul>	Yes Repair or replace the terminal, then go to Step 9.
		No Go to the next step.



	<ul style="list-style-type: none"> <li>• Disconnect ECT sensor connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>		
4	<b>CLASSIFY ECT SENSOR MALFUNCTION OR WIRING HARNESS MALFUNCTION</b> <ul style="list-style-type: none"> <li>• Connect the M-MDS to the DLC-2.</li> <li>• Access ECT PID.</li> <li>• Connect a jumper wire between ECT sensor terminals A and B (wiring harness-side).</li> <li>• Verify the ECT value.</li> <li>• Is the voltage <b>4.58 V or below?</b></li> </ul>	Yes Replace the ECT sensor, then go to Step 9.  (See <a href="#">ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [LF].</a> )	
		No Go to the next step.	
5	<b>INSPECT ECT SENSOR SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position (Engine off).</li> <li>• Measure the voltage between ECT sensor terminal A (wiring harness-side) and body ground.</li> <li>• Is the voltage <b>B+</b>?</li> </ul>	Yes Repair or replace the wiring harness for short to power supply, then go to Step 9.	
		No Go to the next step.	
6	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Disconnect the PCM connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes Repair or replace the terminal, then go to Step 9.	
		No Go to the next step.	
7	<b>INSPECT ECT SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Inspect the continuity between ECT sensor terminal A (wiring harness-side) and PCM terminal 2AH.</li> <li>• Is there continuity?</li> </ul>	Yes Go to the next step.	
		No Repair or replace the wiring harness for open circuit, then go to Step 9.	
8	<b>INSPECT ECT SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between ECT sensor terminal B (wiring harness-side) and PCM terminal 2AY.</li> <li>• Is there continuity?</li> </ul>	Yes Go to the next step.	
		No Repair or replace the wiring harness for open circuit, then go to the next step.	
9	<b>VERIFY TROUBLESHOOTING OF DTC P0118 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Start the engine, or perform the KOEO self-test with M-MDS.</li> </ul>	Yes Replace the PCM, then go to the next step.  (See <a href="#">PCM REMOVAL/INSTALLATION [LF].</a> )	
		No Go to the next step.	

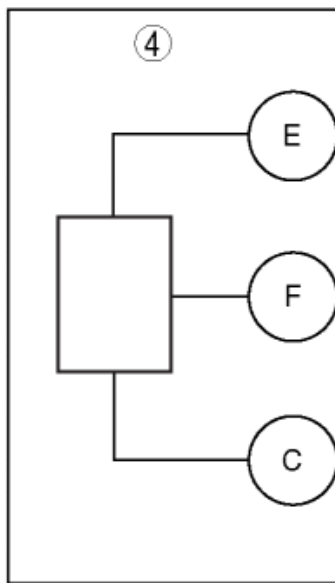
	(See <a href="#">KOE0/KOER SELF TEST [LF]</a> .)		
	<ul style="list-style-type: none"><li>Is the same DTC present?</li></ul>		
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>Perform the "AFTER REPAIR PROCEDURE".</li></ul> (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a> .)	Yes	Go to the applicable DTC troubleshooting. (See <a href="#">DTC TABLE [LF]</a> .)
		No	Troubleshooting completed.

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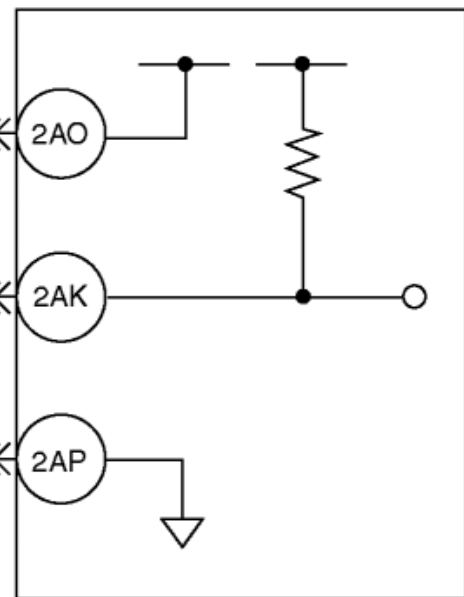
DTC P0122 [LF]

DTC P0122	TP sensor No.1 circuit low input
DETECTION CONDITION	<ul style="list-style-type: none"><li>If the PCM detects that the TP sensor No.1 voltage is <b>below 0.1 V</b> while the engine is running, the PCM determines that the TP sensor No.1 circuit has a malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>This is a continuous monitor (CCM).</li><li>The MIL illuminates if the PCM detects the above malfunction conditions during first drive cycles.</li><li>PENDING CODE is available if the PCM detects the above malfunction condition.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>TP sensor No.1 malfunction</li><li>Connector or terminal malfunction</li><li>Short to ground in wiring harness between throttle body terminal F and PCM terminal 2AK</li><li>Open circuit in wiring harness between throttle body terminal F and PCM terminal 2AK</li><li>Open circuit in wiring harness between throttle body terminal E and PCM terminal 2AO</li><li>PCM malfunction</li></ul>

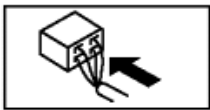
TP SENSOR NO.1  
(THROTTLE BODY)



PCM

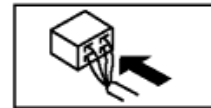


THROTTLE BODY  
WIRING HARNESS-SIDE CONNECTOR



PCM  
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>CLASSIFY TP SENSOR NO.1 OR WIRING HARNESS MALFUNCTION</b> <ul style="list-style-type: none"> <li>Connect the M-MDS.</li> <li>Access TP1 PID.</li> </ul>	Yes Go to the next step.
		No Go to Step 5.

	<ul style="list-style-type: none"> <li>• Disconnect throttle body connector.</li> <li>• Connect a jumper wire between throttle body terminals E and F (wiring harness-side).</li> <li>• Is the voltage <b>above 4.9 V</b>?</li> </ul>		
4	<b>INSPECT TP SENSOR NO.1</b> <ul style="list-style-type: none"> <li>• Inspect the TP sensor No.1.</li> </ul> <p>(See <b>THROTTLE POSITION (TP) SENSOR INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>• Is TP sensor No.1 okay?</li> </ul>	Yes Inspect throttle body terminal E for poor connection. Repair or replace if necessary, then go to Step 8.	
		No Replace the throttle body, then go to Step 8. (See <b>INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [LF]</b> .)	
5	<b>INSPECT POWER SUPPLY CIRCUIT VOLTAGE AT THROTTLE BODY CONNECTOR</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position (Engine off).</li> <li>• Measure the voltage at throttle body terminal E (wiring harness-side).</li> <li>• Is the voltage <b>within 4.5— 5.5 V</b>?</li> </ul>	Yes Go to the next step.	
		No Repair or replace for an open circuit between throttle body terminal E (wiring harness-side) and PCM terminal 2AO (wiring harness-side).  Then go to Step 8.	
6	<b>VERIFY TP SENSOR NO.1 SIGNAL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Inspect for continuity between throttle body terminal F (wiring harness-side) and PCM terminal 2AK (wiring harness-side).</li> <li>• Is there continuity?</li> </ul>	Yes Go to the next step.	
		No Repair or replace the wiring harness, then go to Step 8.	
7	<b>VERIFY TP SENSOR NO.1 SIGNAL CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between throttle body terminal F (wiring harness-side) and body ground.</li> <li>• Is there continuity?</li> </ul>	Yes Repair or replace the wiring harness, then go to the next step.	
		No Go to the next step.	
8	<b>VERIFY TROUBLESHOOTING OF DTC P0122 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Turn the ignition switch to the ON position (Engine off).</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Start the engine and warm it up completely.</li> <li>• Is the same DTC present?</li> </ul>	Yes Replace the PCM, then go to the next step. (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)	
		No Go to the next step.	
9	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform the "AFTER REPAIR PROCEDURE".</li> </ul> <p>(See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</p>	Yes Go to the applicable DTC inspection. (See <b>DTC TABLE [LF]</b> .)	

	• Is any DTC present?	No	Troubleshooting completed.
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[Back to Top](#)

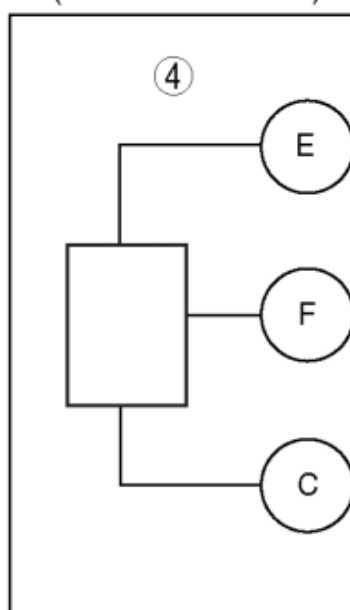
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2008 - MX-5 - Engine

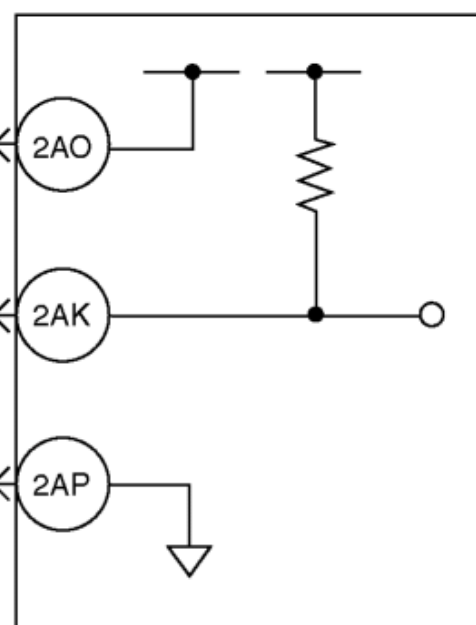
DTC P0123 [LF]

DTC P0123	TP sensor No.1 circuit high input
DETECTION CONDITION	<ul style="list-style-type: none"><li>If the PCM detects the TP sensor No.1 voltage is to be <b>above 4.9 V</b> after ignition switch to the ON position, PCM determines that TP sensor No.1 circuit has a malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>This is a continuous monitor (CCM).</li><li>The MIL illuminates if the PCM detects the above malfunction condition during first drive cycles.</li><li>PENDING CODE is available if the PCM detects the above malfunction condition.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>TP sensor No.1 malfunction</li><li>Connector or terminal malfunction</li><li>Open circuit in wiring harness between throttle body terminal C and PCM terminal 2AP</li><li>Open circuit in wiring harness between throttle body terminal F and PCM terminal 2AK</li><li>Short to constant voltage supply circuit in wiring harness between throttle body terminal F and PCM terminal 2AK</li><li>PCM malfunction</li></ul>

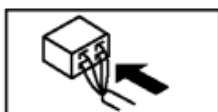
TP SENSOR NO.1  
(THROTTLE BODY)



PCM

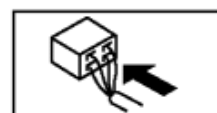


THROTTLE BODY  
WIRING HARNESS-SIDE CONNECTOR



PCM  
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b>	Yes Perform repair or diagnosis according to the available repair information.
	<ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	<ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> No Go to the next step.
	<b>INSPECT THROTTLE BODY CONNECTION FOR</b>	



3	<b>POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Disconnect the throttle body connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
4	<b>INSPECT TP SENSOR NO.1</b> <ul style="list-style-type: none"> <li>• Inspect the TP sensor No.1. (See <b>THROTTLE POSITION (TP) SENSOR INSPECTION [LF]</b>)</li> <li>• Is the TP sensor No.1 okay?</li> </ul>	Yes	Go to the next step.
		No	Replace the throttle body, then go to Step 9. (See <b>INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [LF]</b> .)
5	<b>INSPECT TP SENSOR NO.1 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position (Engine off).</li> <li>• Measure the voltage between throttle body terminal F (wiring harness-side) and body ground.</li> <li>• Is the voltage <b>above 4.9 V</b>?</li> </ul>	Yes	Repair or replace for a short to power supply. Then, go to Step 9.
		No	Go to the next step.
6	<b>VERIFY TP SENSOR NO.1 SIGNAL CIRCUIT FOR SHORT TO CONSTANT VOLTAGE CIRCUIT</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between throttle body terminals E and F (wiring harness-side).</li> <li>• Is there continuity?</li> </ul>	Yes	Repair or replace suspected wiring harness, then go to Step 9.
		No	Go to the next step.
7	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Disconnect the PCM connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair the terminal, then go to Step 9.
		No	Go to the next step.
8	<b>VERIFY TP SENSOR NO.1 GROUND CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between throttle body terminal C (wiring harness-side) and PCM terminal 2AP (wiring harness-side).</li> <li>• Is there continuity?</li> </ul>	Yes	Repair or replace for an open circuit between TP sensor No.1 terminal C (wiring harness-side) and PCM terminal 2AP (wiring harness-side). Then, go to the step.
		No	Go to the next step.
9	<b>VERIFY TROUBLESHOOTING OF DTC P0123 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> </ul>	Yes	Replace the PCM, then go to the next step. (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)

	<ul style="list-style-type: none"><li>• Turn the ignition switch to the ON position (Engine off).</li><li>• Clear the DTC from the PCM memory using the M-MDS.</li><li>• Start the engine and warm it up completely.</li><li>• Is the same DTC present?</li></ul>	No	Go to the next step.
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "AFTER REPAIR PROCEDURE".</li></ul> (See <b>AFTER REPAIR PROCEDURE [LF]</b> .)	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.
	<ul style="list-style-type: none"><li>• Is any DTC present?</li></ul>		

## 2008 - MX-5 - Engine

### DTC P0125 [LF]

DTC P0125	Excessive time to enter closed loop fuel control
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors the ECT sensor signal at PCM terminal 2AH after engine is started while the engine is cold. If the engine coolant temperature does not reach the expected temperature for specified period, the PCM determines that it has taken an excessive amount of time for the engine coolant temperature to reach the temperature necessary to start closed-loop fuel control.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (Engine cooling system).</li> <li>The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>ECT sensor malfunction</li> <li>Cooling system malfunction</li> <li>Poor connection of connectors</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Engine cooling system related) been recorded?</li> </ul>	No Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.

2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<b>VERIFY CURRENT INPUT SIGNAL STATUS: IS CONCERN INTERMITTENT OR CONSTANT</b> <ul style="list-style-type: none"> <li>Start the engine.</li> <li>Warm up the engine completely.</li> <li>Access ECT PID using the M-MDS.</li> <li>Is ECT PID <b>above 60 °C {140 °F}</b>?</li> </ul>	Yes	Intermittent concern exists. Go to INTERMITTENT CONCERNS TROUBLESHOOTING procedure.  (See <b>INTERMITTENT CONCERN TROUBLESHOOTING [LF]</b> .)
		No	Go to the next step.
4	<b>INSPECT POOR CONNECTION OF ECT SENSOR CONNECTOR</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the ECT sensor connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
5	<b>INSPECT ECT SENSOR</b> <ul style="list-style-type: none"> <li>Inspect the ECT sensor.</li> </ul> (See <b>ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [LF]</b> .) <ul style="list-style-type: none"> <li>Is it normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the ECT sensor, then go to Step 7.  (See <b>ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [LF]</b> .)
6	<b>INSPECT POOR CONNECTION OF PCM CONNECTOR</b> <ul style="list-style-type: none"> <li>Disconnect the PCM connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	<b>VERIFY TROUBLESHOOTING OF DTC P0125 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all</li> </ul>	Yes	Replace the PCM, then go to the next step.  (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)

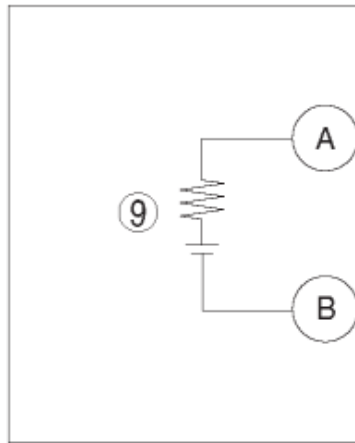
	<p>disconnected connectors.</p> <ul style="list-style-type: none"><li>• Clear the DTC from the PCM memory using the M-MDS.</li><li>• Turn the ignition switch to the ON position (Engine off).</li><li>• Access ECT PID using the M-MDS.</li><li>• Wait until ECT PID <b>below 8 °C {46 °F}</b>.</li><li>• Start the engine and warm it up completely.</li><li>• Is the PENDING CODE for this DTC present?</li></ul>		No Go to the next step.
8	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"><li>• Perform the “AFTER REPAIR PROCEDURE”.</li></ul> <p>(See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</p> <ul style="list-style-type: none"><li>• Are any DTC present?</li></ul>	Yes	Go to the applicable DTC troubleshooting. (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.

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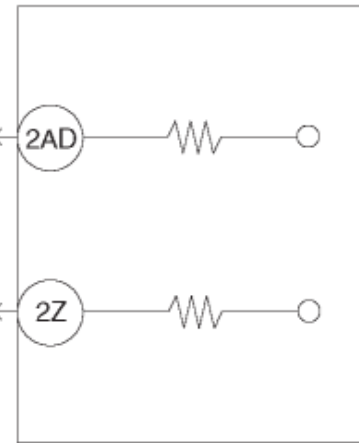
DTC P0131 [LF]

DTC P0131	Front HO2S circuit low input
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors the input voltage from the front HO2S and the front HO2S output current when the engine is running. If the input voltage is <b>less than 1.8 V</b> or the output current is <b>less than –5 mA</b>, the PCM determines that the front HO2S circuit voltage is low.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (HO2S).</li><li>• The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Front HO2S malfunction</li><li>• Connector or terminal malfunction</li><li>• Open circuit in wiring harness between front HO2S terminal A and PCM terminal 2AD</li><li>• Short to ground in wiring harness between front HO2S terminal A and PCM terminal 2AD</li><li>• Open circuit in wiring harness between front HO2S terminal B and PCM terminal 2Z</li><li>• Short to ground in wiring harness between front HO2S terminal B and PCM terminal 2Z</li><li>• PCM malfunction</li></ul>

## FRONT HO2S

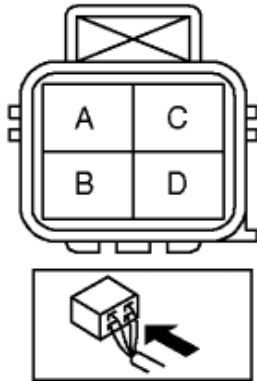


## PCM



## FRONT HO2S

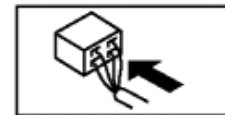
### WIRING HARNESS-SIDE CONNECTOR



## PCM

### WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?</li> </ul>	Yes Go to the next step.  No Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> No Go to the next step.
3	<b>VERIFY RELATED PENDING OR STORED DTC</b> <ul style="list-style-type: none"> <li>Turn the Ignition switch off, then to the ON position (Engine off).</li> <li>Verify the pending code or stored DTCs</li> </ul>	Yes Go to the appropriate DTC troubleshooting procedures. (See <a href="#">DTC TABLE [LF]</a> .)  No Go to the next step.

	using the M-MDS. • Is other DTC present?	No	Go to the next step.
4	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> • Is DTC P0131 on FREEZE FRAME DATA?	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See <a href="#">DTC TABLE [LF]</a> .)
5	<b>INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION</b> • Turn the ignition switch off. • Disconnect the front HO2S connector. • Inspect for poor connection (such as damaged/pulled-out pins, corrosion). • Is there any malfunction?	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.
6	<b>INSPECT FRONT HO2S CIRCUIT FOR SHORT TO GROUND</b> • Turn the Ignition switch off. • Inspect for continuity between the following terminals and body ground: <ul style="list-style-type: none"> <li>▪ Front HO2S terminal A (wiring harness-side) and body ground</li> <li>▪ Front HO2S terminal B (wiring harness-side) and body ground</li> </ul> • Is there continuity?	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 10.
		No	Go to the next step.
7	<b>INSPECT FRONT HO2S CIRCUIT FOR OPEN CIRCUIT</b> • Turn the ignition switch off. • Inspect for continuity between the following circuits: <ul style="list-style-type: none"> <li>▪ Front HO2S terminal A (wiring harness-side) and PCM terminal 2AD (wiring harness-side)</li> <li>▪ Front HO2S terminal B (wiring harness-side) and PCM terminal 2Z (wiring harness-side)</li> </ul> • Is there continuity?	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible open circuit, then go to Step 10.
8	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> • Turn the ignition switch off. • Disconnect the PCM connector. • Inspect for poor connection (such as	Yes	Repair or replace the terminal, then go to Step 10.
		No	Go to the next step.



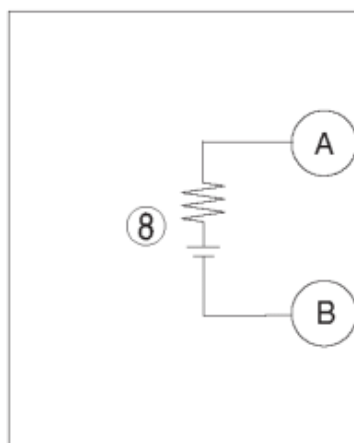
	<p>damaged/pulled-out pins, corrosion).</p> <ul style="list-style-type: none"> <li>Is there any malfunction?</li> </ul>		
9	<p><b>INSPECT FRONT HO2S</b></p> <ul style="list-style-type: none"> <li>Inspect the front HO2S.</li> </ul> <p>(See <a href="#">FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF]</a>.)</p> <ul style="list-style-type: none"> <li>Is there any malfunction?</li> </ul>	<p>Yes Replace the front HO2S, then go to the next step.</p> <p>(See <a href="#">FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]</a>.)</p>	
		<p>No Go to the next step.</p>	
10	<p><b>VERIFY TROUBLESHOOTING OF DTC P0131 COMPLETED</b></p> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Perform the KOEO self-test (using M-MDS) or the HO2S heater, HO2S, and TWC Repair Verification Drive Mode (not using M-MDS).</li> </ul> <p>(See <a href="#">KOEO/KOER SELF TEST [LF]</a>.)</p> <p>(See <a href="#">OBD-II DRIVE MODE [LF]</a>.)</p> <ul style="list-style-type: none"> <li>Is the PENDING CODE for this DTC present?</li> </ul>	<p>Yes Replace the PCM, then go to the next step.</p> <p>(See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a>.)</p>	
		<p>No Go to the next step.</p>	
11	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"> <li>Perform the "AFTER REPAIR PROCEDURE".</li> </ul> <p>(See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</p> <ul style="list-style-type: none"> <li>Are any DTCs present?</li> </ul>	<p>Yes Go to the applicable DTC inspection.</p> <p>(See <a href="#">DTC TABLE [LF]</a>.)</p>	
		<p>No DTC troubleshooting completed.</p>	

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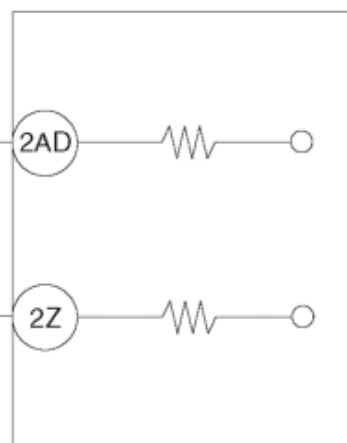
DTC P0132 [LF]

DTC P0132	Front HO2S circuit high input
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors the input voltage from the front HO2S and the front HO2S output current when the engine is running. If the input voltage is <b>more than 3.8 V</b> or the output current is <b>more than 5 mA</b>, the PCM determines that the front HO2S circuit voltage is high.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (HO2S).</li><li>• The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Front HO2S malfunction</li><li>• Connector or terminal malfunction</li><li>• Short to power supply in wiring harness between front HO2S terminal A and PCM terminal 2AD</li><li>• Short to power supply in wiring harness between front HO2S terminal B and PCM terminal 2Z</li><li>• PCM malfunction</li></ul>

## FRONT HO2S

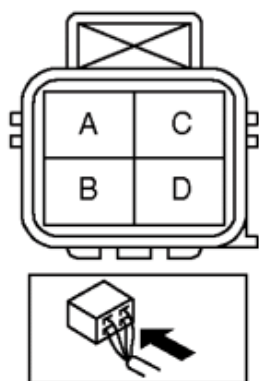


## PCM



## FRONT HO2S

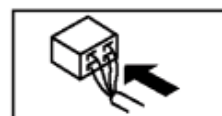
### WIRING HARNESS-SIDE CONNECTOR



## PCM

### WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?</li> </ul>	Yes Go to the next step.  No Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> No Go to the next step.
3	<b>VERIFY RELATED PENDING OR STORED DTC</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off, then to the ON position (Engine off).</li> <li>Verify the pending code or stored DTCs using the M-MDS.</li> </ul>	Yes Go to the appropriate DTC troubleshooting procedures.  (See <a href="#">DTC TABLE [LF]</a> .)

	<ul style="list-style-type: none"> <li>Is other DTC present?</li> </ul>	No	Go to the next step.
4	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> <ul style="list-style-type: none"> <li>Is DTC P0132 on FREEZE FRAME DATA?</li> </ul>	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See <b>DTC TABLE [LF]</b> .)
5	<b>INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the front HO2S connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
6	<b>INSPECT FRONT HO2S CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Measure the voltage between the following terminals and body ground: <ul style="list-style-type: none"> <li>Front HO2S terminal A (wiring harness-side) and body ground</li> <li>Front HO2S terminal B (wiring harness-side) and body ground</li> </ul> </li> <li>Is the voltage <b>B+</b>?</li> </ul>	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 9.
		No	Go to the next step.
7	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the PCM connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 9.
		No	Go to the next step.
8	<b>INSPECT FRONT HO2S</b> <ul style="list-style-type: none"> <li>Inspect the front HO2S. (See <b>FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF]</b>.)</li> <li>Is there any malfunction?</li> </ul>	Yes	Replace the front HO2S, then go to the next step.  (See <b>FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]</b> .)
		No	Go to the next step.
9	<b>VERIFY TROUBLESHOOTING OF DTC P0132 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> </ul>	Yes	Replace the PCM, then go to the next step.  (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)

	<ul style="list-style-type: none"><li>• Clear the DTC from the PCM memory using the M-MDS.</li><li>• Perform the KOEO self-test (using M-MDS) or the HO2S heater, HO2S, and TWC Repair Verification Drive Mode (not using M-MDS).</li></ul> <p>(See <a href="#">KOEO/KOER SELF TEST [LF]</a>.)</p> <p>(See <a href="#">OBD-II DRIVE MODE [LF]</a>.)</p> <ul style="list-style-type: none"><li>• Is the PENDING CODE for this DTC present?</li></ul>	No	Go to the next step.
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the “AFTER REPAIR PROCEDURE”. (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</li><li>• Are any DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .)
		No	DTC troubleshooting completed.

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DTC P0133 [LF]

DTC P0133	Front HO2S circuit problem
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors the peak differential value of oxygen sensor signal after A/F fluctuation being provided when the following conditions are met. If the peak differential value is lower than the threshold value.</li><li>• The PCM determines that front HO2S circuit is slow.</li></ul> <p><b>MONITORING CONDITIONS</b></p> <ul style="list-style-type: none"><li>▪ HO2S heater, HO2S, and TWC Repair Verification Drive Mode</li><li>▪ Following conditions are met:<ul style="list-style-type: none"><li>• Front HO2S heater monitor is completed.</li><li>• Fuel system loop status is closed loop fuel control.</li></ul></li><li>▪ Engine speed: <b>1,750—3,500 rpm</b>.</li><li>▪ Charging efficiency: <b>25—63 %</b> (at engine speed: <b>2,500 rpm</b>).</li><li>▪ Engine coolant temperature <b>above 70 °C {158 °F}</b></li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is an intermittent monitor. (HO2S)</li><li>• The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>• DIAGNOSTIC MONITORING TEST RESULTS is available.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
	<ul style="list-style-type: none"><li>• Front HO2S deterioration</li><li>• Front HO2S malfunction</li></ul>

<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Front HO2S looseness</li> <li>• Pressure regulator (built-in fuel pump unit) malfunction</li> <li>• Fuel pump malfunction</li> <li>• Clogged or restricted fuel filter (built-in fuel pump unit)</li> <li>• Fuel leakage in fuel line between fuel distribution pipe and fuel pump</li> <li>• Exhaust system leakage</li> <li>• Purge solenoid valve malfunction</li> <li>• Improper connection purge solenoid hose</li> <li>• Insufficient compression</li> <li>• Engine malfunction (Engine coolant leakage)</li> </ul>
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### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>• Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?</li> </ul>	No Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>• If the vehicle is not repaired, go to the next step.</li> </ul>
	<ul style="list-style-type: none"> <li>• Verify related Service Bulletins and/or on-line repair information availability.</li> <li>• Is any related repair information available?</li> </ul>	No Go to the next step.
3	<b>VERIFY RELATED PENDING AND STORED DTC</b>	Yes Go to DTC P0443 troubleshooting procedures, then go to Step 13.
	<ul style="list-style-type: none"> <li>• Turn the ignition switch off, then to the ON position (Engine off).</li> <li>• Verify the pending or stored DTCs using the M-MDS.</li> <li>• Is DTC P0443 also present?</li> </ul>	No Go to the next step.
4	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>• Is DTC P0133 on FREEZE FRAME DATA?</li> </ul>	No Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.

		(See <b>DTC TABLE [LF]</b> .)
5	<b>INSPECT INSTALLATION OF FRONT HO2S</b> <ul style="list-style-type: none"> <li>Inspect if the front HO2S is loosely installed.</li> <li>Is the front HO2S installed securely?</li> </ul>	Yes Go to the next step.  No Retighten the front HO2S, then go to Step 10.  (See <b>REAR HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]</b> .)
6	<b>INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM</b> <ul style="list-style-type: none"> <li>Visually inspect if there is any gas leakage between the exhaust manifold and front HO2S.</li> <li>Is there gas leakage?</li> </ul>	Yes Repair or replace any malfunctioning exhaust part, then go to Step 10.  No Go to the next step.
7	<b>INSPECT FRONT HO2S</b> <ul style="list-style-type: none"> <li>Inspect the front HO2S. (See <b>FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF]</b>.)</li> <li>Is there any malfunction?</li> </ul>	Yes Replace the front HO2S, then go to Step 10.  (See <b>FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]</b> .)  No Go to the next step.
8	<b>INSPECT FUEL LINE PRESSURE</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Inspect the fuel line pressure while the engine running. (See <b>FUEL LINE PRESSURE INSPECTION [LF]</b>.)</li> <li>Is the fuel line pressure normal?</li> </ul>	Yes Go to the next step.  No Repair or replace any malfunctioning exhaust part, then go to Step 10.
9	<b>INSPECT SEALING OF ENGINE COOLANT PASSAGE</b> <ul style="list-style-type: none"> <li>Perform the "ENGINE COOLANT LEAKAGE INSPECTION"</li> <li>(See <b>ENGINE COOLANT LEAKAGE INSPECTION [LF]</b>.)</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace malfunctioning part according to the inspection result. Then go to the next step.  No Go to the next step.
10	<b>VERIFY TROUBLESHOOTING OF DTC P0133 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the PCM memory using the M-MDS or equivalent.</li> </ul>	Yes Replace the PCM, then go to the next step.  (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)  No Go to the next step.



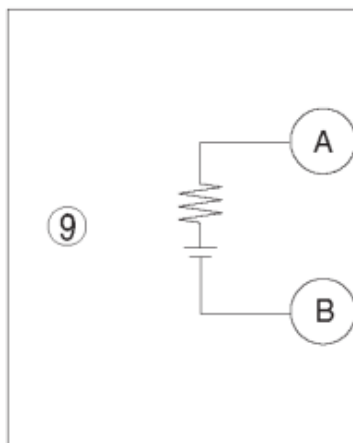
	<ul style="list-style-type: none"><li>• Perform the “PCM Adaptive Memory Produce Drive Mode” and “HO2S heater, HO2S, and TWC Repair Verification Drive Mode”.</li></ul> <p>(See <b>OBD-II DRIVE MODE [LF]</b>.)</p> <ul style="list-style-type: none"><li>• Is the PENDING CODE for this DTC present?</li></ul>		
11	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the “AFTER REPAIR PROCEDURE”.</li></ul> <p>(See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</p> <ul style="list-style-type: none"><li>• Are any DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection.  (See <b>DTC TABLE [LF]</b> .)
		No	DTC troubleshooting completed.

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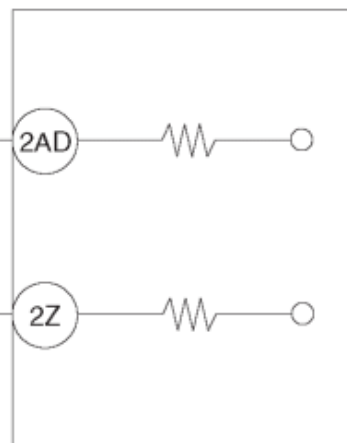
DTC P0134 [LF]

DTC P0134	Front HO2S no activity detected
DETECTION CONDITION	<div><ul style="list-style-type: none"><li>The PCM monitors the front HO2S element impedance when the following conditions are met. If the front HO2S element impedance is <b>80 ohms</b> or more, the PCM determines that front HO2S is not activated.</li></ul></div> <div><b>MONITORING CONDITIONS</b><ul style="list-style-type: none"><li>HO2S, HO2S heater and TWC Repair Verification Drive Mode</li><li>Following conditions are met<ul style="list-style-type: none"><li>Time from engine start is <b>above 30 s</b> (ECT when engine start is <b>20 °C {68 °F}</b>).</li></ul></li></ul></div> <div><b>Diagnostic support note</b><ul style="list-style-type: none"><li>This is an intermittent monitor (HO2S).</li><li>The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul></div>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Front HO2S deterioration</li><li>Front HO2S heater malfunction</li><li>Open circuit or short to ground in wiring harness between front HO2S terminal A and PCM terminal 2AD</li></ul>

## FRONT HO2S

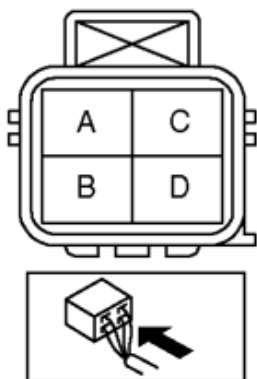


## PCM



## FRONT HO2S

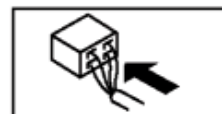
### WIRING HARNESS-SIDE CONNECTOR



## PCM

### WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>VERIFY RELATED PENDING AND STORED DTC</b> <b>NOTE:</b> <ul style="list-style-type: none"> <li>If fuel monitor DTC, DTC P0132 is retrieved, ignore it until P0134 is fixed.</li> </ul>	Yes Go to the appropriate DTC troubleshooting procedures.
		No Go to the next step.

	<ul style="list-style-type: none"> <li>• Turn the ignition switch off, then to the ON position. (Engine off)</li> <li>• Verify pending and stored DTCs using the M-MDS.</li> <li>• Is other DTC present?</li> </ul>		
4	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> <ul style="list-style-type: none"> <li>• Is DTC P0134 on FREEZE FRAME DATA?</li> </ul>	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.  (See <a href="#">DTC TABLE [LF]</a> .)
5	<b>INSPECT INSTALLATION OF FRONT HO2S</b> <ul style="list-style-type: none"> <li>• Inspect if the front HO2S is loosely installed.</li> <li>• Is the sensor installed securely?</li> </ul>	Yes	Go to the next step.
		No	Install sensor securely, then go to Step 10.
6	<b>INSPECT FRONT HO2S SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY CIRCUIT</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to OFF.</li> <li>• Disconnect the front HO2S connector.</li> <li>• Measure the voltage between front HO2S terminal A (wiring harness-side) and GND.</li> <li>• Is the voltage <b>above 3.22 V</b>?</li> </ul>	Yes	Repair or replace for short to power supply circuit, then go to Step 10.
		No	Go to the next step.
7	<b>INSPECT FRONT HO2S SIGNAL CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"> <li>• Disconnect the PCM connector.</li> <li>• Inspect for continuity between PCM terminal 2AD (wiring harness-side) and front HO2S terminal A (wiring harness-side).</li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace for open circuit, then go to Step 10.
8	<b>INSPECT FRONT HO2S HEATER</b> <ul style="list-style-type: none"> <li>• Inspect the front HO2S heater.</li> </ul> (See <a href="#">FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF]</a> .) <ul style="list-style-type: none"> <li>• Is the front HO2S heater normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the front HO2S, then go to Step 10.  (See <a href="#">FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]</a> .)
9	<b>INSPECT FRONT HO2S</b> <ul style="list-style-type: none"> <li>• Inspect the front HO2S.</li> </ul> (See <a href="#">FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]</a> .) <ul style="list-style-type: none"> <li>• Is there any malfunction?</li> </ul>	Yes	Go to the next step.
		No	Replace the front HO2S, then go to the next step.  (See <a href="#">FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]</a> .)
10	<b>VERIFY TROUBLESHOOTING OF DTC P0134 COMPLETED</b>	Yes	Replace the PCM, then go to the next step.

	<ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Turn the ignition switch to the ON position. (Engine off)</li><li>• Clear the DTC from memory using the M-MDS.</li><li>• Perform the KOER self-test (using M-MDS) or the HO2S heater, HO2S, and TWC Repair Verification Drive Mode (not using M-MDS).</li></ul> <p>(See <a href="#">KOE0/KOER SELF TEST [LF]</a>.)</p> <p>(See <a href="#">OBD-II DRIVE MODE [LF]</a>.)</p> <ul style="list-style-type: none"><li>• Is the PENDING CODE for this DTC present?</li></ul>	(See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)	
		No	Go to the next step.
11	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "AFTER REPAIR PROCEDURE". (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</li><li>• Are any DTC present?</li></ul>	Yes	Go to the applicable DTC troubleshooting. (See <a href="#">DTC TABLE [LF]</a> .)
		No	Troubleshooting completed.

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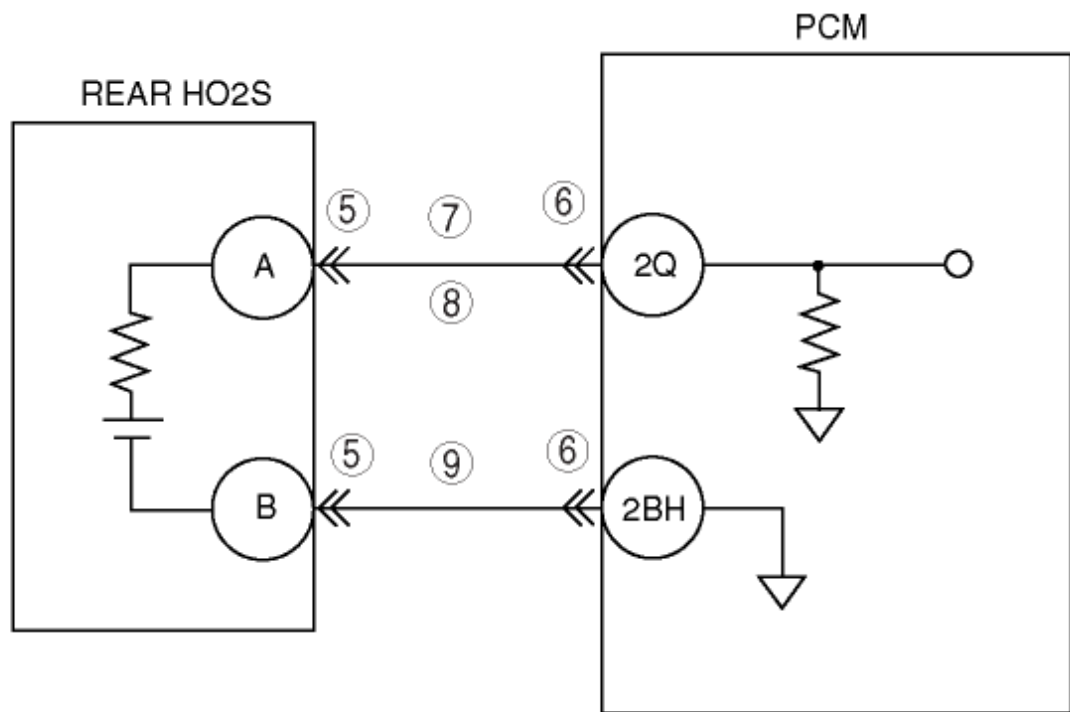
DTC P0137 [LF]

DTC P0137	Rear HO2S circuit low input
DETECTION CONDITION	<div><ul style="list-style-type: none"><li>• The PCM monitors input voltage from rear HO2S. If the input voltage from the rear HO2S is below <b>0.1 V</b> for <b>35.2 s</b> the PCM determines that circuit input is low.</li></ul><p><b>MONITORING CONDITIONS</b></p><ul style="list-style-type: none"><li>▪ HO2S, HO2S heater and TWC repair verification drive mode</li><li>▪ Following conditions are met.<ul style="list-style-type: none"><li>• Engine speed is <b>above 1,500 rpm</b>.</li><li>• Engine coolant temperature is <b>above 70 °C {158 °F}</b>.</li><li>• Fuel injector control in rear HO2S closed loop control.</li></ul></li></ul><ul style="list-style-type: none"><li>• The PCM monitors the input voltage from the rear HO2S when the following conditions are met. Under the following monitoring conditions, if the input voltage from the rear HO2S does not even <b>exceed 0.1 V</b> though the short term fuel trim is controlled up to <b>20.5 %</b> for <b>9.6 s</b>, the PCM determines that sensor circuit input is low.</li></ul><p><b>MONITORING CONDITIONS</b></p><ul style="list-style-type: none"><li>▪ HO2S, HO2S heater and TWC repair verification drive mode</li><li>▪ Following conditions are met for <b>above 20.8 s</b>.<ul style="list-style-type: none"><li>• Engine speed is <b>above 1,500 rpm</b>.</li><li>• Engine coolant temperature is <b>above 70 °C {158 °F}</b>.</li></ul></li></ul><p><b>Diagnostic support note</b></p><ul style="list-style-type: none"><li>• This is a continuous monitor (HO2S).</li><li>• The MIL illuminates if the PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li></ul></div>

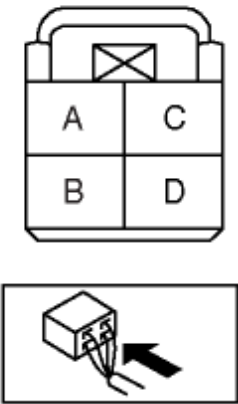
- FREEZE FRAME DATA is available.
- The DTC is stored in the PCM memory.

**POSSIBLE CAUSE**

- Rear HO2S malfunction
- Short to body ground circuit in wiring between rear HO2S terminal A and PCM terminal 2Q
- Open circuit in wiring between rear HO2S terminal A and PCM terminal 2Q
- Open circuit in wiring between rear HO2S terminal B and PCM terminal 2BH
- PCM malfunction

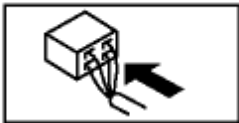


REAR HO2S  
WIRING HARNESS-SIDE CONNECTOR



PCM  
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



**Diagnostic procedure**

STEP	INSPECTION		ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?</li> </ul>	Yes	Go to next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<b>VERIFY RELATED PENDING OR STORED DTCS</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off, then to the ON position. (Engine off)</li> <li>Verify pending code or stored DTCs using M-MDS.</li> <li>Is other DTC present?</li> </ul>	Yes	Go to the appropriate DTC troubleshooting procedures. (See <b>DTC TABLE [LF]</b> .)
		No	Go to the next step.
4	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> <ul style="list-style-type: none"> <li>Is DTC P0137 on FREEZE FRAME DATA?</li> </ul>	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA. (See <b>DTC TABLE [LF]</b> .)
5	<b>INSPECT REAR HO2S CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect rear HO2S connector.</li> <li>Inspect for poor connection (such as damaged, pulled-out terminals, corrosion).</li> <li>Is there any malfunctions?</li> </ul>	Yes	Repair terminal, then go to Step 11.
		No	Go to the next step.
6	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Inspect for poor connection (such as damaged, pulled-out terminals, corrosion).</li> <li>Is there any malfunctions?</li> </ul>	Yes	Repair terminal, then go to Step 11.
		No	Go to the next step.



7	<b>INSPECT REAR HO2S SIGNAL CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"> <li>Inspect continuity between rear HO2S terminal A (harness-side) and PCM terminal 2Q (harness-side).</li> <li>Is there any continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace harness for open circuit, then go to Step 11.
8	<b>INSPECT REAR HO2S SIGNAL CIRCUIT FOR SHORT TO GROUND CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect continuity between rear HO2S terminal A (harness-side) and body ground.</li> <li>Is any voltage reading?</li> </ul>	Yes	Replace short to power supply circuit, then go to Step 11.
		No	Go to the next step.
9	<b>INSPECT REAR HO2S GROUND CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"> <li>Inspect continuity between rear HO2S terminal B (harness-side) and PCM terminal 2BH(harness-side).</li> <li>Is there any continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace harness for open circuit, then go to Step 11.
10	<b>INSPECT REAR HO2S</b> <ul style="list-style-type: none"> <li>Inspect the rear HO2S.</li> <li>(See <a href="#">REAR HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF]</a>.)</li> <li>Is HO2S normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the rear HO2S, then go to the next step.  (See <a href="#">REAR HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]</a> .)
11	<b>VERIFY TROUBLESHOOTING OF DTC P0137 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Turn the ignition switch off. (Engine OFF).</li> <li>Clear DTC from PCM memory using M-MDS.</li> <li>Perform the KOEO self-test with M-MDS, or "PCM Adaptive Memory Procedure Drive Mode" and "HO2S Heater, HO2S, and TWC Repair Verification Drive Mode".</li> <li>(See <a href="#">KOEO/KOER SELF TEST [LF]</a>.)</li> <li>(See <a href="#">OBD-II DRIVE MODE [LF]</a>.)</li> <li>Is PENDING CODE of same DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step.  (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
12	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the "After Repair Procedure".</li> <li>(See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</li> </ul>	Yes	Go to the applicable DTC inspection.  (See <a href="#">DTC TABLE [LF]</a> .)

	• Is there any DTC present?	No	Troubleshooting completed.
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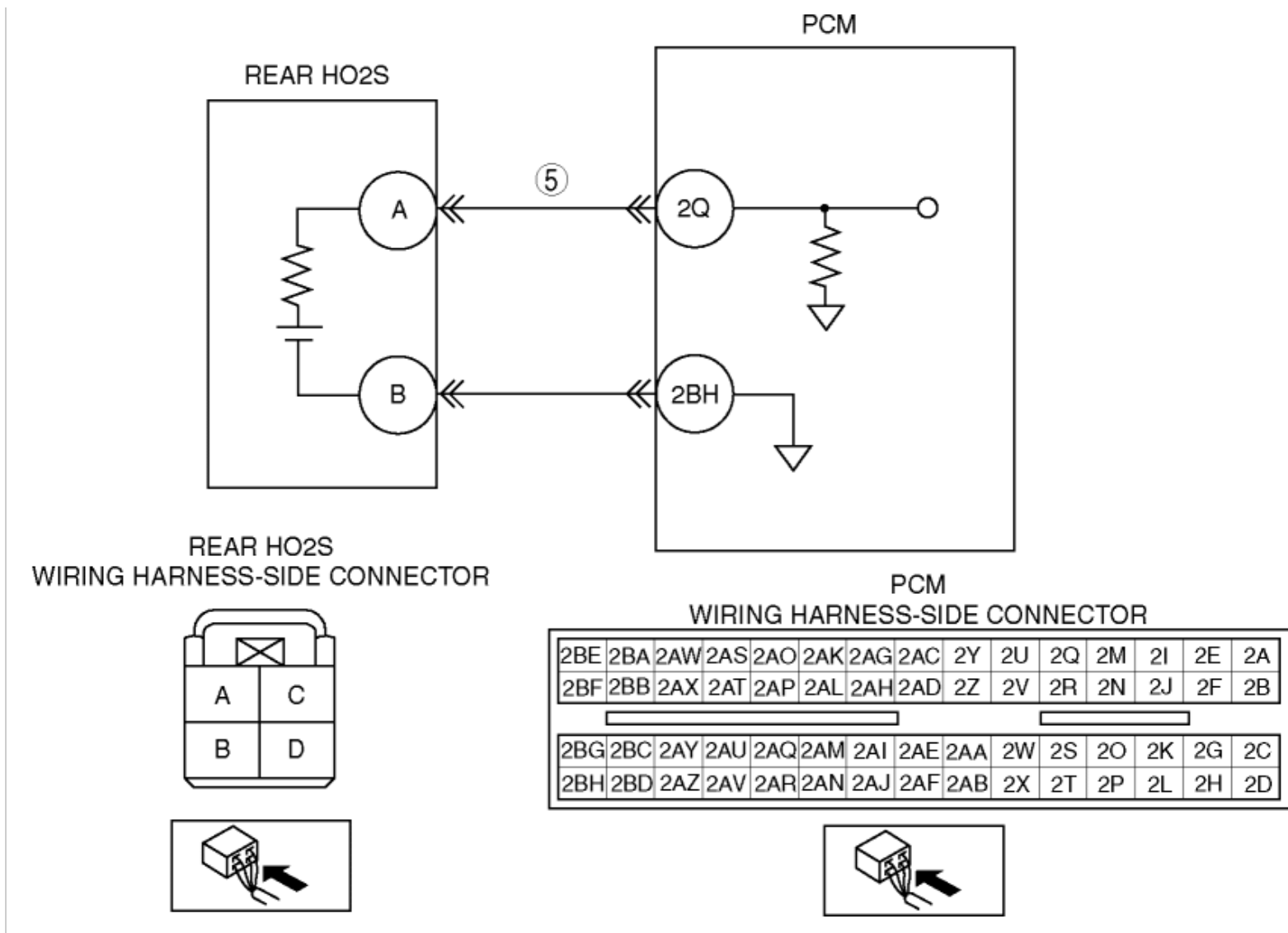
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DTC P0138 [LF]

DTC P0138	Rear HO2S circuit high input
DETECTION CONDITION	<ul style="list-style-type: none"><li>The PCM monitors input voltage from rear HO2S. If the input voltage from the rear HO2S sensor is <b>above 1.2 V</b> for <b>0.8 s</b>, the PCM determines that circuit input is high.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>This is a continuous monitor (HO2S).</li><li>The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Rear HO2S malfunction</li><li>Short to power supply in wiring harness between rear HO2S terminal A and PCM terminal 2Q</li><li>Rear HO2S or PCM terminal shorted</li><li>PCM malfunction</li></ul>



### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?</li> </ul>	Yes Go to the next step.  No Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> No Go to the next step.
3	<b>VERIFY RELATED PENDING OR STORED DTC</b>	Yes Go to the appropriate DTC troubleshooting

	<p>Turn the ignition switch off, then to the ON position. (Engine off)</p> <ul style="list-style-type: none"> <li>• Verify pending code or stored DTCs using M-MDS.</li> <li>• Is other DTC present?</li> </ul>	<p>procedures.</p> <p>(See <a href="#">DTC TABLE [LF]</a>.)</p>	
		No	Go to the next step.
4	<p><b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b></p> <ul style="list-style-type: none"> <li>• Is DTC P0138 on FREEZE FRAME DATA?</li> </ul>	Yes	Go to the next step.
		No	<p>Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.</p> <p>(See <a href="#">DTC TABLE [LF]</a>.)</p>
5	<p><b>INSPECT REAR HO2S SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY</b></p> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect rear HO2S connector.</li> <li>• Turn the ignition switch to the ON position. (Engine off)</li> <li>• Measure the voltage between rear HO2S terminal A (wiring harness-side) and body ground.</li> <li>• Is there any voltage?</li> </ul>	Yes	Replace short to power supply, then go to Step 7.
		No	Go to the next step.
6	<p><b>INSPECT REAR HO2S</b></p> <ul style="list-style-type: none"> <li>• Inspect the rear HO2S</li> </ul> <p>(See <a href="#">REAR HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF]</a>.)</p> <ul style="list-style-type: none"> <li>• Is HO2S normal?</li> </ul>	Yes	Go to the next step.
		No	<p>Replace sensor, then go to the next step.</p> <p>(See <a href="#">REAR HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]</a>.)</p>
7	<p><b>VERIFY TROUBLESHOOTING OF DTC P0138 COMPLETED</b></p> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Turn the ignition switch to the ON position. (Engine off)</li> <li>• Clear the DTC from the memory using the M-MDS.</li> <li>• Run the KOEO self-test with M-MDS, or PCM adaptive memory procedure drive mode and HO2S heater, HO2S, and TWC repair verification drive mode.</li> </ul> <p>(See <a href="#">KOEO/KOER SELF TEST [LF]</a>.)</p> <p>(See <a href="#">OBD-II DRIVE MODE [LF]</a>.)</p> <ul style="list-style-type: none"> <li>• Is the PENDING CODE for this DTC present?</li> </ul>	Yes	<p>Replace the PCM, then go to the next step.</p> <p>(See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a>.)</p>
		No	Go to the next step.
8	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"> <li>• Perform the "AFTER REPAIR PROCEDURE".</li> </ul>	Yes	<p>Go to the applicable DTC troubleshooting.</p> <p>(See <a href="#">DTC TABLE [LF]</a>.)</p>

	(See <a href="#">AFTER REPAIR PROCEDURE [LF]</a> .)		
	• Are any DTC present?	No	Troubleshooting completed.

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DTC P0139 [LF]

DTC P0139	Rear HO2S circuit problem
DETECTION CONDITION	<div><ul style="list-style-type: none"><li>The PCM monitors the rich (<b>0.4 V</b>) to lean (<b>0.3 V</b>) response time of the rear HO2S. The PCM measures the response time when the following conditions are met. The PCM determines a rear HO2S response deterioration malfunction when the measured response time is more than the threshold value (<b>80 ms</b>) five consecutive times.</li></ul><div>MONITORING CONDITIONS</div><ul style="list-style-type: none"><li>PCM Adaptive Memory Production, HO2S heater, HO2S, and TWC Repair Verification Drive Mode</li><li>Following conditions are met:<ul style="list-style-type: none"><li>During deceleration fuel cut</li><li>Engine speed is <b>above 500 rpm</b>.</li><li>Engine coolant temperature is <b>above 70 °C {158 °F}</b>.</li><li>Rear HO2S output voltage is <b>above 0.4 V</b>.</li></ul></li></ul><ul style="list-style-type: none"><li>The PCM monitors for a time-out malfunction (when rear HO2S remains <b>above 0.3 V</b> for longer than a specified period of time during fuel cut control). The PCM measures the amount of time from when the following conditions are met until the rear HO2S output voltage drops <b>below 0.3 V</b>. The PCM determines a rear HO2S time-out malfunction when the detected time is more than the threshold value (<b>6 s</b>) three consecutive times.</li></ul><div>MONITORING CONDITIONS</div><ul style="list-style-type: none"><li>PCM Adaptive Memory Production, HO2S heater, HO2S, and TWC Repair Verification Drive Mode</li><li>Following conditions are met:<ul style="list-style-type: none"><li>During deceleration fuel cut</li><li>Engine speed is <b>above 500 rpm</b>.</li><li>Engine coolant temperature is <b>above 70 °C {158 °F}</b>.</li><li>Rear HO2S is activated (<b>more than 0.55 V</b>)</li></ul></li></ul></div>

	<p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>• This is an intermittent monitor. (HO2S)</li> <li>• The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li> <li>• DIAGNOSTIC MONITORING TEST RESULTS is available.</li> <li>• PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>• FREEZE FRAME DATA is available.</li> <li>• The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Rear HO2S deterioration</li> <li>• Rear HO2S malfunction</li> <li>• Looseness rear HO2S</li> <li>• Pressure regulator (built-in fuel pump unit) malfunction</li> <li>• Fuel pump malfunction</li> <li>• Fuel filter (built-in fuel pump unit) clogged or restricted</li> <li>• Fuel leakage on fuel line from fuel distribution pipe and fuel pump</li> <li>• Leakage exhaust system</li> <li>• Purge solenoid valve malfunction</li> <li>• Purge solenoid hoses improper connection</li> <li>• Insufficient compression</li> <li>• Engine malfunction (Leakage engine coolant)</li> </ul>

**Diagnostic procedure**

STEP	INSPECTION		ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b>	Yes	Go to the next step.
	<ul style="list-style-type: none"> <li>• Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?</li> </ul>	No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b>	Yes	Perform repair or diagnosis according to the available repair information.
	<ul style="list-style-type: none"> <li>• Verify related Service Bulletins and/or on-line repair information</li> </ul>		<ul style="list-style-type: none"> <li>• If the vehicle is not</li> </ul>



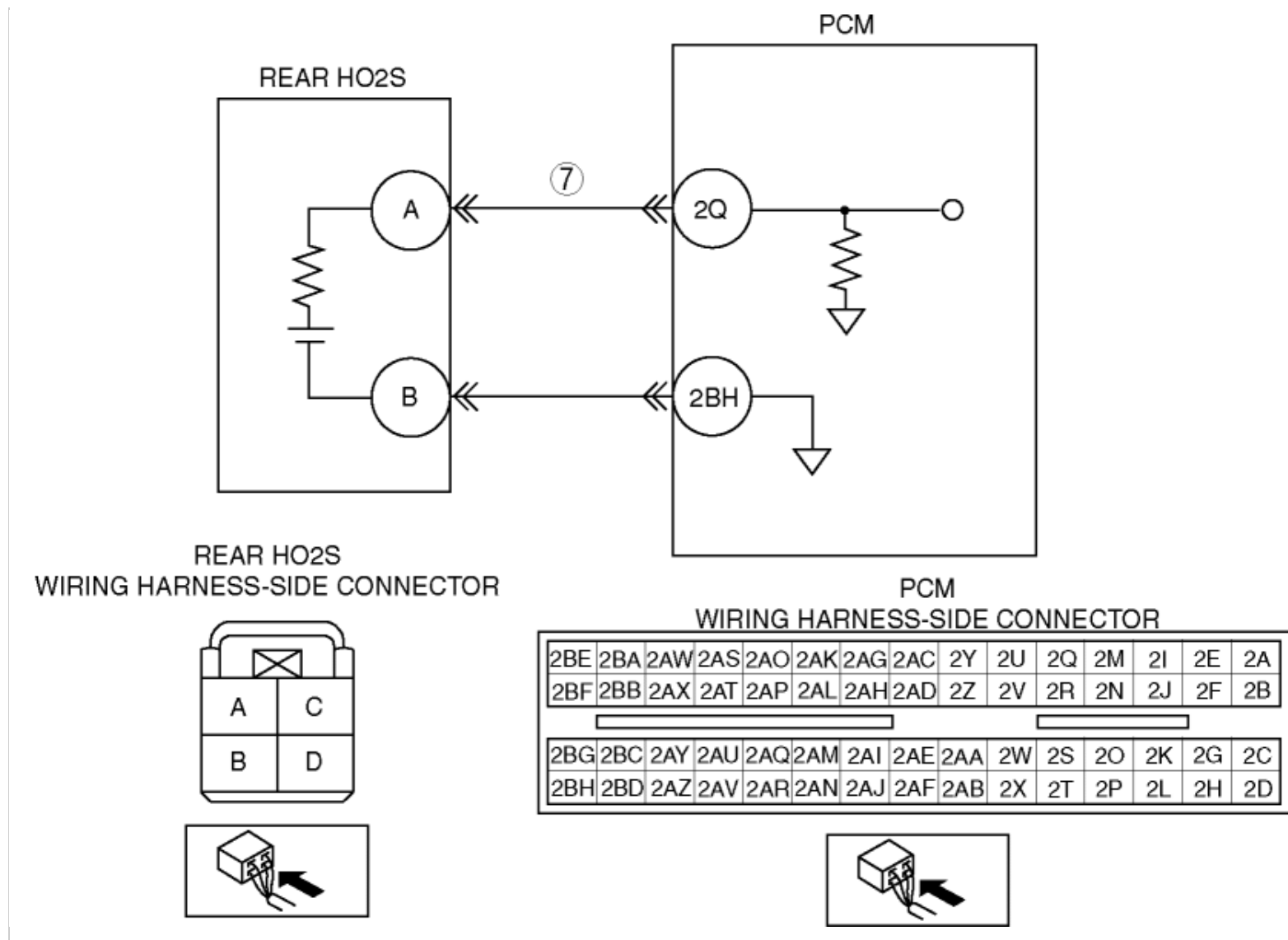
	<p>availability.</p> <ul style="list-style-type: none"> <li>Is any related repair information available?</li> </ul>		<p>repaired, go to the next step.</p>
		No	Go to the next step.
3	<p><b>VERIFY RELATED PENDING AND STORED DTC</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch off, then to the ON position (Engine off).</li> <li>Verify pending and /or stored DTCs using the M-MDS.</li> <li>Is DTC P0443 also present?</li> </ul>	Yes	Go to DTC P0443 troubleshooting procedures, then go to Step 13.
		No	Go to the next step.
4	<p><b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b></p> <ul style="list-style-type: none"> <li>Is DTC P0139 on FREEZE FRAME DATA?</li> </ul>	Yes	Go to the next step.
		No	<p>Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.</p> <p>(See <a href="#">DTC TABLE [LF]</a>.)</p>
5	<p><b>INSPECT INSTALLATION OF REAR HO2S</b></p> <ul style="list-style-type: none"> <li>Inspect if the rear HO2S is loosely installed.</li> <li>Is the front HO2S installed securely?</li> </ul>	Yes	Go to the next step.
		No	<p>Retighten the rear HO2S, then go to Step 10/</p> <p>(See <a href="#">REAR HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]</a>.)</p>
6	<p><b>INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM</b></p> <ul style="list-style-type: none"> <li>Visually inspect if there is any gas leakage between the exhaust manifold and rear HO2S.</li> <li>Is there gas leakage?</li> </ul>	Yes	Repair or replace any malfunctioning exhaust part, then go to Step 10.
		No	Go to the next step.
7	<p><b>INSPECT REAR HO2S</b></p> <ul style="list-style-type: none"> <li>Inspect the rear HO2S.</li> </ul> <p>(See <a href="#">REAR HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF]</a>.)</p> <ul style="list-style-type: none"> <li>Is there any malfunction?</li> </ul>	Yes	<p>Replace the rear HO2S, then go to Step 10.</p> <p>(See <a href="#">REAR HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]</a>.)</p>
		No	Go to the next step.
8	<p><b>INSPECT FUEL LINE PRESSURE</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Inspect the fuel line pressure while the engine running.</li> </ul> <p>(See <a href="#">FUEL LINE PRESSURE INSPECTION [LF]</a>.)</p>	Yes	Go to the next step.
		No	Repair or replace any malfunctioning exhaust part, then go to Step 10.

	<ul style="list-style-type: none"> <li>Is the fuel line pressure normal?</li> </ul>		
9	<b>INSPECT SEALING OF ENGINE COOLANT PASSAGE</b> <ul style="list-style-type: none"> <li>Perform the "ENGINE COOLANT LEAKAGE INSPECTION".</li> </ul> <p>(See <b>ENGINE COOLANT LEAKAGE INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace malfunctioning part according to the inspection result. Then go to the next step.
		No	Go to the next step.
10	<b>VERIFY TROUBLESHOOTING OF DTC P0139 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the PCM memory using the M-MDS or equivalent.</li> <li>Perform the "PCM Adaptive Memory Produce Drive Mode" and "HO2S heater, HO2S, and TWC Repair Verification Drive Mode".</li> </ul> <p>(See <b>OBD-II DRIVE MODE [LF]</b>.)</p> <ul style="list-style-type: none"> <li>Is the PENDING CODE for this DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step.  (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)
		No	Go to the next step.
11	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the "AFTER REPAIR PROCEDURE".</li> </ul> <p>(See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</p> <ul style="list-style-type: none"> <li>Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection.  (See <b>DTC TABLE [LF]</b> .)
		No	DTC troubleshooting completed.

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DTC P0140 [LF]

DTC P0140	Rear HO2S no activity detected
DETECTION CONDITION	<div><ul style="list-style-type: none"><li>The PCM monitors the input voltage from the rear HO2S when the following conditions are met. Under the following monitoring conditions, if the input voltage from the rear HO2S does not even <b>exceed 0.55 V</b> though the short term fuel trim is controlled up to <b>20.5 %</b> for <b>9.6 s</b>, the PCM determines that sensor circuit is not activated.</li></ul></div> <div><p><b>MONITORING CONDITIONS</b></p><ul style="list-style-type: none"><li>HO2S, HO2S heater and TWC repair verification drive mode</li><li>Following conditions are met for <b>above 20.8 s</b><ul style="list-style-type: none"><li>Engine speed is <b>above 1,500 rpm</b>.</li><li>Engine coolant temperature is <b>above 70 °C {158 °F}</b>.</li></ul></li><li>Rear HO2S voltage is <b>above 0.1 V</b></li></ul></div> <div><p><b>Diagnostic support note</b></p><ul style="list-style-type: none"><li>This is an intermittent monitor (HO2S).</li><li>The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul></div>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Rear HO2S deterioration</li><li>Rear HO2S heater malfunction</li><li>Leakage exhaust system</li><li>Open circuit or short to ground in wiring harness between rear HO2S terminal A and PCM terminal 2Q</li><li>Insufficient compression</li><li>Engine malfunction</li></ul>



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.

3	<b>VERIFY RELATED PENDING AND STORED DTC</b>  <b>NOTE:</b> <ul style="list-style-type: none"> <li>• If fuel monitor DTC, DTC P0132 is retrieved, ignore it until P0140 is fixed.</li> <li>• Turn the ignition switch off, then to the ON position. (Engine off)</li> <li>• Verify pending and stored DTCs using M-MDS.</li> <li>• Is other DTC present?</li> </ul>	Yes	Go to the appropriate DTC troubleshooting procedures.  (See <b>DTC TABLE [LF]</b> .)
		No	Go to the next step.
4	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> <ul style="list-style-type: none"> <li>• Is DTC P0140 on FREEZE FRAME DATA?</li> </ul>	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.  (See <b>DTC TABLE [LF]</b> .)
5	<b>INSPECT REAR HO2S</b> <ul style="list-style-type: none"> <li>• Inspect the rear HO2S  (See <b>REAR HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF]</b>.)</li> <li>• Is HO2S normal?</li> </ul>	Yes	Go to Step 8.
		No	Go to the next step.
6	<b>INSPECT INSTALLATION OF REAR HO2S</b> <ul style="list-style-type: none"> <li>• Check if rear HO2S is loosely installed.</li> <li>• Is sensor installed securely?</li> </ul>	Yes	Go to the next step.
		No	Install sensor securely, then go to Step 10.
7	<b>INSPECT GAS LEAKAGE FROM EXHAUST SYSTEM</b> <ul style="list-style-type: none"> <li>• Visually check if any gas leakage is found between exhaust pipe and rear HO2S.</li> <li>• Is there any gas leakage?</li> </ul>	Yes	Repair or replace any malfunctioning exhaust part, then go to Step 10.
		No	<ul style="list-style-type: none"> <li>• Inspect the following wiring harnesses for open or short to ground circuit, repair or replace wiring harness if necessary. <ul style="list-style-type: none"> <li>▪ Rear HO2S terminal A (wiring harness-side) to PCM terminal 2Q (wiring harness-side)</li> </ul> <ul style="list-style-type: none"> <li>• Repair or replace wiring harness if necessary.</li> </ul> </li> <li>• If all items above are normal, replace malfunctioning sensor.</li> </ul>

			Then go to Step 10.
8	<b>INSPECT SEALING OF ENGINE COOLANT PASSAGE</b>  <b>WARNING:</b> <ul style="list-style-type: none"> <li>• Removing the radiator cap when the radiator is hot is dangerous. Scalding coolant and steam may shoot out and cause serious injury.</li> <li>• When removing the radiator cap, wrap a thick cloth around and turn it slowly.</li> <li>• Remove radiator cap.</li> <li>• Perform procedure to bleed air from the engine coolant, then run the engine at idle.</li> <li>• Is there any small bubble, which makes the engine coolant white at filling opening?</li> </ul> <b>NOTE:</b> <ul style="list-style-type: none"> <li>• Large bubbles are normal since they are remaining air coming out from the engine coolant passage.</li> </ul>	Yes Air gets in from poor sealing on head gasket or other areas between combustion chamber and engine coolant passage.  Repair or replace the malfunctioning part, then go to Step 10.	No Go to the next step.
9	<b>INSPECT ENGINE COMPRESSION</b> <ul style="list-style-type: none"> <li>• Inspect engine compression.</li> </ul> (See <b>COMPRESSION INSPECTION [LF]</b> .) <ul style="list-style-type: none"> <li>• Is it normal?</li> </ul>	Yes Go to the next step.	No Perform engine overhaul for repairs, then go to the next step.
10	<b>VERIFY TROUBLESHOOTING OF DTC P0140 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Turn the ignition switch to the ON position. (Engine off)</li> <li>• Clear the DTC from the memory using the M-MDS.</li> <li>• Perform the KOER self-test (using M-MDS) or the HO2S</li> </ul>	Yes Replace the PCM, then go to the next step.  (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)	No Go to the next step.

	<p>heater, HO2S, and TWC Repair Verification Drive Mode (not using M-MDS).</p> <p>(See <a href="#">KOE0/KOER SELF TEST [LF]</a>.)</p> <p>(See <a href="#">OBD-II DRIVE MODE [LF]</a>.)</p> <ul style="list-style-type: none"><li>• Is the PENDING CODE for this DTC present?</li></ul>		
11	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"><li>• Perform the “AFTER REPAIR PROCEDURE”.</li></ul> <p>(See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</p> <ul style="list-style-type: none"><li>• Are any DTC present?</li></ul>	Yes	Go to the applicable DTC troubleshooting.  (See <a href="#">DTC TABLE [LF]</a> .)
		No	Troubleshooting completed.

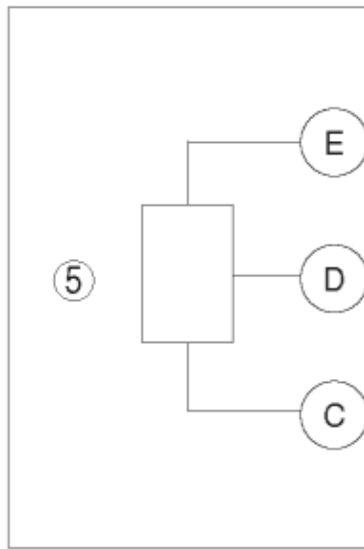
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DTC P0222 [LF]

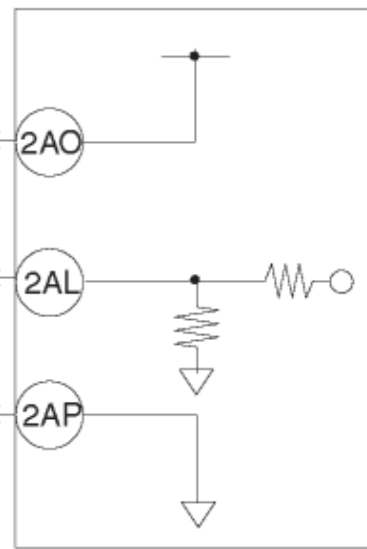
DTC P0222	TP sensor No.2 circuit low input
DETECTION CONDITION	<ul style="list-style-type: none"><li>• If PCM detects TP sensor No.2 voltage is to be <b>below 0.1 V</b> after the ignition switch to the ON position, the PCM determines that TP circuit has a malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (CCM).</li><li>• The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• TP sensor No.2 malfunction</li><li>• Connector or terminal malfunction</li><li>• Open circuit in wiring harness between throttle body terminal E and PCM terminal 2AO</li><li>• Short to ground in wiring harness between throttle body terminal E and PCM terminal 2AO</li><li>• Open circuit in wiring harness between throttle body terminal D and PCM terminal 2AL</li><li>• Short to ground in wiring harness between throttle body terminal D and PCM terminal 2AL</li><li>• PCM malfunction</li></ul>



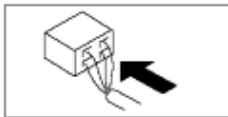
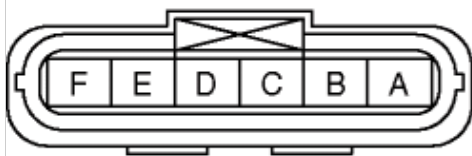
# TP SENSOR NO.2 (THROTTLE BODY)



# PCM

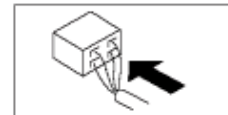


## THROTTLE BODY WIRING HARNESS-SIDE CONNECTOR



## PCM WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.

3	<b>INSPECT THROTTLE BODY CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the throttle body connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	<b>INSPECT TP SENSOR NO.2 CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Inspect for continuity between the following circuits: <ul style="list-style-type: none"> <li>▪ Throttle body terminal D (wiring harness-side) and body ground</li> <li>▪ Throttle body terminal E (wiring harness-side) and body ground</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 8.
		No	Go to the next step.
5	<b>INSPECT TP SENSOR NO.2</b> <ul style="list-style-type: none"> <li>• Inspect TP sensor No.2. (See <b>THROTTLE POSITION (TP) SENSOR INSPECTION [LF].</b>)</li> <li>• Is there any malfunction?</li> </ul>	Yes	Replace the throttle body, then go to Step 8.  (See <b>INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [LF].</b> )
		No	Go to the next step.
6	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the PCM connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	<b>INSPECT TP SENSOR NO.2 CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Inspect for continuity between the following terminals: <ul style="list-style-type: none"> <li>▪ Throttle body terminal E (wiring harness-side) and PCM terminal 2AO (wiring harness-side)</li> <li>▪ Throttle body terminal D</li> </ul> </li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible an open circuit, then go to the next step.

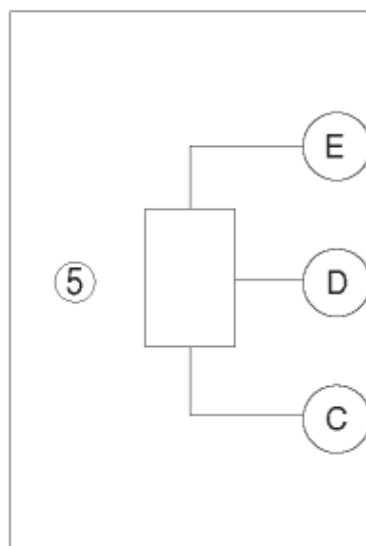
	<p>(wiring harness-side) and PCM terminal 2AL (wiring harness-side)</p> <ul style="list-style-type: none"> <li>• Is there continuity?</li> </ul>		
8	<p><b>VERIFY TROUBLESHOOTING OF DTC P0222 COMPLETED</b></p> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Start the engine.</li> <li>• Is the same DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step. (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
9	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"> <li>• Perform the "AFTER REPAIR PROCEDURE". (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</li> <li>• Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .)
		No	DTC troubleshooting completed.

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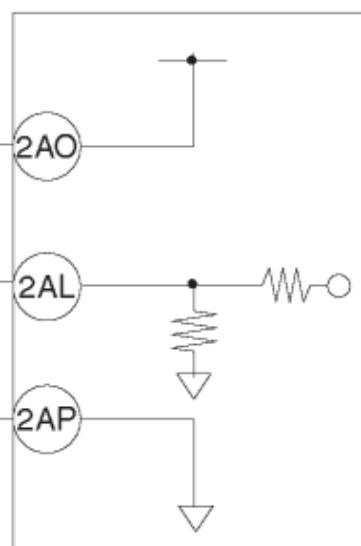
DTC P0223 [LF]

DTC P0223	TP sensor No.2 circuit high input
DETECTION CONDITION	<ul style="list-style-type: none"><li>• If the PCM detects the TP sensor No.2 voltage is to be <b>above 4.9 V</b> after the ignition switch to the ON position, the PCM determines that the TP circuit has a malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (CCM).</li><li>• The MIL illuminates if the PCM detects the above malfunction condition in the first drive cycle.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• TP sensor No.2 malfunction</li><li>• Connector or terminal malfunction</li><li>• Short to power supply in wiring harness between throttle body terminal D and PCM terminal 2AL</li><li>• Open circuit in wiring harness between throttle body terminal C and PCM terminal 2AP</li><li>• PCM malfunction</li></ul>

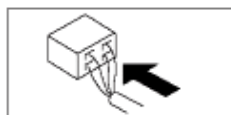
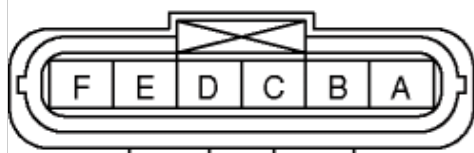
# TP SENSOR NO.2 (THROTTLE BODY)



# PCM

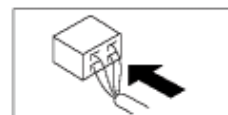


## THROTTLE BODY WIRING HARNESS-SIDE CONNECTOR



## PCM WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.  No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> No Go to the next step.
	<b>INSPECT THROTTLE BODY CONNECTOR FOR POOR</b>	

3	<b>CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the throttle body connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	<b>INSPECT TP SENSOR NO.2 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position (Engine off).</li> <li>• Measure the voltage between throttle body terminal D (wiring harness-side) and body ground.</li> <li>• Is the voltage <b>B+</b>?</li> </ul>	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 8.
		No	Go to the next step.
5	<b>INSPECT TP SENSOR NO.2</b> <ul style="list-style-type: none"> <li>• Inspect TP sensor No.2. (See <a href="#">THROTTLE POSITION (TP) SENSOR INSPECTION [LF].</a>)</li> <li>• Is there any malfunction?</li> </ul>	Yes	Replace the throttle body, then go to Step 8.  (See <a href="#">INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [LF].</a> )
		No	Go to the next step.
6	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the PCM connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	<b>INSPECT TP SENSOR NO.2 GROUND CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Inspect for continuity between throttle body terminal C (wiring harness-side) and PCM terminal 2AP (wiring harness-side).</li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible an open circuit, then go to the next step.
8	<b>VERIFY TROUBLESHOOTING OF DTC P0223 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Start the engine.</li> </ul>	Yes	Replace the PCM, then go to the next step.  (See <a href="#">PCM REMOVAL/INSTALLATION [LF].</a> )
		No	Go to the next step.

	Is the same DTC present?		
9	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>Perform the “AFTER REPAIR PROCEDURE”.</li></ul> (See <b>AFTER REPAIR PROCEDURE [LF]</b> .)	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	DTC troubleshooting completed.

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DTC P0300 [LF]

DTC P0300	Random misfire detected
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors CKP sensor input signal interval time. The PCM calculates change of interval time for each cylinder. If change of interval time exceeds preprogrammed criteria, the PCM detects misfire in the corresponding cylinder. While the engine is running, the PCM counts number of misfires that occurred at <b>200 crankshaft revolutions</b> and <b>1,000 crankshaft revolutions</b> and calculates misfire ratio for each crankshaft revolution. If the ratio exceeds the preprogrammed criteria, the PCM determines that a misfire, which can damage catalytic converter or affect emission performance, has occurred.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (Misfire).</li><li>• The MIL illuminates if the PCM detects the misfire which affects emission performance in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>• The MIL flashes if the PCM detects the misfire which can damage the catalytic converter during the first drive cycle.</li><li>• PENDING CODE is available if the PCM detects the misfire which affects emission performance during the first drive cycle.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
	<ul style="list-style-type: none"><li>• CKP sensor malfunction</li><li>• CMP sensor malfunction</li><li>• Ignition system malfunction<ul style="list-style-type: none"><li>▪ Spark plug malfunction</li><li>▪ Ignition coil malfunction</li></ul></li><li>• MAF sensor contamination</li><li>• Excess air suction in intake air system (between MAF sensor and intake manifold)</li><li>• Fuel pump malfunction</li></ul>



<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Fuel pressure regulator (built-in fuel pump unit) malfunction</li> <li>• Fuel line clogged</li> <li>• Fuel filter clogged</li> <li>• Fuel leakage in fuel line</li> <li>• Fuel runout</li> <li>• Poor quality fuel</li> <li>• Purge control solenoid valve malfunction</li> <li>• PCV valve malfunction</li> <li>• EGR valve malfunction</li> <li>• Vacuum hoses damages or improper connection</li> <li>• Related connector and terminal malfunction</li> <li>• Related wiring harness malfunction</li> <li>• Insufficient compression</li> <li>• Variable valve timing control system improper</li> <li>• Fuel injector malfunction</li> </ul>
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## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b> <ul style="list-style-type: none"> <li>• Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Misfire related) been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>• Verify related Service Bulletins and/or on-line repair information availability.</li> <li>• Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>• If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>VERIFY RELATED PENDING CODE OR STORED DTC</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off then to the ON position (Engine off).</li> <li>• Verify related pending code or</li> </ul>	Yes Go to the appropriate DTC troubleshooting. (See <a href="#">DTC TABLE [LF]</a> .)
		No Go to the next step.

	<p>stored DTCs.</p> <ul style="list-style-type: none"><li>• Are other DTCs present?</li></ul>		
4	<b>VERIFY CURRENT INPUT SIGNAL STATUS (KEY TO ON/IDLE)</b> <ul style="list-style-type: none"><li>• Access APP1, APP2, ECT, IAT, MAF, RPM, TP, and VSS PIDs using M-MDS.</li><li>(See <b>PCM INSPECTION [LF]</b>.)</li><li>• Is there any signal that is far out of specification when the ignition switch is turned to the ON position and the engine idles?</li></ul>	Yes	Inspect suspected circuit and/or part according to inspection results.  (See <b>PCM INSPECTION [LF]</b> .)  Then go to Step 21.
		No	Go to the next step.
5	<b>VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION</b> <ul style="list-style-type: none"><li>• Inspect the same PIDs as in Step 4 while simulating FREEZE FRAME DATA condition.</li><li>• Is there any signal which causes drastic changes?</li></ul>	Yes	Inspect suspected circuit and/or part according to inspection results.  (See <b>PCM INSPECTION [LF]</b> .)  Then go to Step 21.
		No	Go to the next step.
6	<b>INSPECT CMP SENSOR</b> <ul style="list-style-type: none"><li>• Inspect CMP sensor.</li><li>(See <b>CAMSHAFT POSITION (CMP) SENSOR INSPECTION [LF]</b>.)</li><li>• Is CMP sensor normal?</li></ul>	Yes	Go to the next step.
		No	Inspect installation condition and damages on timing chain and gears, repair the malfunctioning part. <ul style="list-style-type: none"><li>• If it is normal, replace the CMP sensor.</li></ul> (See <b>CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION [LF]</b> .)  Then go to Step 21.
7	<b>VERIFY CKP SENSOR INSTALLATION CONDITION</b> <ul style="list-style-type: none"><li>• Inspect for CKP sensor looseness.</li><li>• Is CKP sensor loosen?</li></ul>	Yes	Retighten the CKP sensor, then go to Step.
		No	Go to the next step.
8	<b>INSPECT IGNITION COIL HARNESES</b> <ul style="list-style-type: none"><li>• Inspect the ignition coil related harness condition (intermittent open or short) for all cylinders.</li><li>• Are harness conditions normal?</li></ul>	Yes	Go to the next step.
		No	Repair suspected wiring harnesses, then go to Step 21.

9	<b>INSPECT IGNITION SYSTEM OPERATION</b> <ul style="list-style-type: none"> <li>Carry out spark test.</li> <li>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b>)</li> <li>Is strong blue spark visible at each cylinder?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace malfunctioning part according to spark test result.  Then go to Step 21.
10	<b>INSPECT MAF PID</b> <ul style="list-style-type: none"> <li>Start the engine.</li> <li>Access MAF PID using the M-MDS.</li> <li>Race the engine and verify that MAF PID changes quickly according to change in the engine speed.</li> <li>Is MAF PID response normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the MAF sensor, then go to Step 21.  (See <b>MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION [LF]</b> .)
11	<b>INSPECT EXCESSIVE AIR SUCTION IN INTAKE AIR SYSTEM</b> <ul style="list-style-type: none"> <li>Inspect for air leakage at following: <ul style="list-style-type: none"> <li>Between the MAF sensor and throttle body</li> <li>Between throttle body and intake manifold</li> </ul> </li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace suspected part, then go to Step 21.
		No	Go to the next step.
12	<b>INSPECT FUEL LINE PRESSURE</b> <ul style="list-style-type: none"> <li>Inspect fuel line pressure.</li> <li>(See <b>FUEL LINE PRESSURE INSPECTION [LF]</b>.)</li> <li>Is fuel line pressure normal?</li> </ul>	Yes	Go to Step 14.
		No	If the fuel line pressure is too low, go to the next step.  If the fuel line pressure is excess high, replace the fuel pump unit, then go to Step 21.  (See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF]</b> .)
13	<b>INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE</b> <ul style="list-style-type: none"> <li>Visually inspect fuel line for fuel leakage.</li> <li>Is there any fuel leakage?</li> </ul>	Yes	Replace suspected fuel line, then go to Step 21.
		No	Inspect fuel filters for following: <ul style="list-style-type: none"> <li>Foreign materials or stain inside fuel filter (low-pressure side)</li> </ul>

			<p>Perform following actions depend on the result above.</p> <ul style="list-style-type: none"> <li>• If foreign materials or stain is found inside fuel filter (low-pressure side), clean the fuel tank and filter (low-pressure side).</li> <li>• If normal, replace the fuel pump unit.</li> </ul> <p>(See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF]</b>.)</p> <p>Then, go to Step 21.</p>
14	<b>INSPECT ENGINE COMPRESSION</b> <ul style="list-style-type: none"> <li>• Inspect engine compression.</li> </ul> <p>(See <b>COMPRESSION INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>• Is it normal?</li> </ul>	Yes	Go to the next step.
		No	Perform engine overhaul for repairs, then go to Step 21.
15	<b>INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION</b> <ul style="list-style-type: none"> <li>• Inspect variable valve timing control system operation.</li> </ul> <p>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>• Does variable valve timing control system work properly?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace malfunctioning part according to variable valve timing control system inspection results, then go to Step 21.
16	<b>INSPECT FUEL INJECTOR OPERATION</b> <ul style="list-style-type: none"> <li>• Perform the Fuel Injector Operation Inspection.</li> </ul> <p>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the malfunctioning part according to the inspection results, then go to Step 21.
		No	Go to the next step.
17	<b>INSPECT OPERATION OF PURGE CONTROL SOLENOID VALVE</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Connect the vacuum pump to purge control solenoid valve and apply vacuum to solenoid.</li> <li>• Verify that solenoid holds vacuum.</li> <li>• Turn the ignition switch to the ON</li> </ul>	Yes	Go to the next step.
		No	<p>Replace the purge control solenoid valve, then go to Step 21.</p> <p>(See <b>PURGE SOLENOID VALVE REMOVAL/INSTALLATION [LF]</b>.)</p>

	<p>position (Engine off).</p> <ul style="list-style-type: none"> <li>• Access EVAPCP PID in SIMULATION TEST using the M-MDS.</li> <li>• Set duty value to <b>100%</b> for EVAPCP PID.</li> <li>• Apply vacuum while turning solenoid from OFF to ON and simulating EVAPCP PID with <b>100%</b> duty value.</li> <li>• Verify that solenoid releases vacuum while solenoid is turned ON.</li> <li>• Is purge control solenoid valve operation normal?</li> </ul>		
18	<p><b>INSPECT PCV VALVE OPERATION</b></p> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Remove PCV valve and inspect valve operation.</li> </ul> <p>(See <b>POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>• Is PCV valve operation normal?</li> </ul>	<p>Yes Replace the PCV valve, then go to Step 21.</p> <p>No Go to the next step.</p>	
19	<p><b>INSPECT OPERATION OF EGR VALVE</b></p> <ul style="list-style-type: none"> <li>• Remove the EGR valve.</li> <li>• Visually inspect the EGR valve for stuck to open.</li> <li>• Is EGR valve stuck to open?</li> </ul>	<p>Yes Repair or replace the EGR valve, then go to Step 21.</p> <p>(See <b>EGR VALVE REMOVAL/INSTALLATION [LF]</b>.)</p> <p>No Go to the next step.</p>	
20	<p><b>INSPECT SEALING OF ENGINE COOLANT PASSAGE</b></p> <ul style="list-style-type: none"> <li>• Perform "ENGINE COOLANT LEAKAGE INSPECTION."</li> </ul> <p>(See <b>ENGINE COOLANT LEAKAGE INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>• Is there any malfunction?</li> </ul>	<p>Yes Repair or replace malfunctioning part according to inspection results.</p> <p>Then go to the next step.</p> <p>No Go to the next step.</p>	
21	<p><b>VERIFY TROUBLESHOOTING OF MISFIRE DTC COMPLETED</b></p> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Turn the ignition switch to the ON position (Engine off).</li> </ul>	<p>Yes Replace the PCM, then go to the next step.</p> <p>(See <b>PCM REMOVAL/INSTALLATION [LF]</b>.)</p> <p>No Go to the next step.</p>	

	<ul style="list-style-type: none"><li>• Clear the DTC from the memory using the M-MDS.</li><li>• Perform the KOER self-test (using M-MDS) or the HO2S heater, HO2S, and TWC Repair Verification Drive Mode (not using M-MDS).</li></ul> <p>(See <a href="#">KOE0/KOER SELF TEST [LF]</a>.)</p> <p>(See <a href="#">OBD-II DRIVE MODE [LF]</a>.)</p> <ul style="list-style-type: none"><li>• Is the PENDING CODE for this DTC present?</li></ul>		
22	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "AFTER REPAIR PROCEDURE".</li></ul> <p>(See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</p> <ul style="list-style-type: none"><li>• Are any DTC present?</li></ul>	Yes	Go to the applicable DTC troubleshooting. (See <a href="#">DTC TABLE [LF]</a> .)
		No	Troubleshooting completed.

## 2008 - MX-5 - Engine

### DTC P0301, P0302, P0303, P0304 [LF]

DTC P0301	Cylinder No.1 misfire detected
DTC P0302	Cylinder No.2 misfire detected
DTC P0303	Cylinder No.3 misfire detected
DTC P0304	Cylinder No.4 misfire detected
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors CKP sensor input signal interval time. The PCM calculates the change of interval time for each cylinder. If the change of interval time exceeds the preprogrammed criteria, the PCM detects a misfire in the corresponding cylinder. While the engine is running, the PCM counts number of misfires that occurred at <b>200 crankshaft revolutions</b> and <b>1,000 crankshaft revolutions</b> and calculates misfire ratio for each crankshaft revolution. If the ratio exceeds the preprogrammed criteria, the PCM determines that a misfire, which can damage catalytic converter or affect emission performance, has occurred.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (Misfire).</li> <li>The MIL illuminates if the PCM detects the misfire which affects emission performance in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li> <li>The MIL flashes if the PCM detects the misfire which can damage the catalytic converter during the first drive cycle.</li> <li>PENDING CODE is available if the PCM detects the misfire which affects emission performance during the first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Spark plug malfunction</li> <li>Ignition system malfunction</li> <li>Fuel injector malfunction</li> <li>Air suction in intake air system (between dynamic chamber and cylinder head)</li> <li>Inadequate engine compression due to engine internal malfunction</li> </ul>

- Related connector or terminal malfunction
- Related wiring harness malfunction

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b> <ul style="list-style-type: none"> <li>• Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Misfire related) been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>• Verify related Service Bulletins and/or on-line repair information availability.</li> <li>• Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>• If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>VERIFY RELATED PENDING CODE OR STORED DTC</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off then to the ON position (Engine off).</li> <li>• Verify related pending code or stored DTCs.</li> <li>• Is other DTCs present?</li> </ul>	Yes Go to the appropriate DTC troubleshooting. (See <a href="#">DTC TABLE [LF]</a> .)
		No Go to the next step.
4	<b>VERIFY CURRENT INPUT SIGNAL STATUS (KEY TO ON /IDLE)</b> <ul style="list-style-type: none"> <li>• Access APP1, APP2, ECT, IAT, MAF, RPM, TP and VSS PIDs using M-MDS.</li> </ul> (See <a href="#">PCM INSPECTION [LF]</a> .) <ul style="list-style-type: none"> <li>• Is there any signal that is far out of specification when ignition switch is turned to the ON position and engine idles?</li> </ul>	Yes Inspect suspected circuit and/or part according to inspection results. Then go to Step 14. (See <a href="#">PCM INSPECTION [LF]</a> .)
		No Go to the next step.
5	<b>VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION</b> <ul style="list-style-type: none"> <li>• Inspect same PIDs as in Step 4 while simulating FREEZE FRAME DATA condition.</li> </ul>	Yes Inspect suspected circuit and/or part according to inspection results. Then go to Step 14. (See <a href="#">PCM INSPECTION [LF]</a> .)



	<ul style="list-style-type: none"> <li>Is there any signal which causes drastic changes?</li> </ul>	No	Go to the next step.
6	<b>INSPECT SPARK PLUG CONDITION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Remove spark plug from suspected cylinder.</li> <li>Inspect spark plug condition: <ul style="list-style-type: none"> <li>Cracks</li> <li>Excess wear</li> <li>Gap</li> <li>Wet</li> </ul> </li> <li>Is any problem found on spark plug?</li> </ul>	Yes	<ul style="list-style-type: none"> <li>If spark plug is wet, fuel flooding is suspected. Then go to Step 14.</li> <li>If spark plug has a cracks, excessive wear or improper gap, replace the malfunctioning spark plug. Then go to Step 14.</li> </ul> <p>(See <b>FUEL INJECTOR REMOVAL/INSTALLATION [LF]</b>.)</p>
		No	Go to the next step.
7	<b>INSPECT IGNITION COIL HARNESSSES</b> <ul style="list-style-type: none"> <li>Inspect the ignition coil related harness condition (intermittent open or short) for suspected cylinder.</li> <li>Are harness conditions normal?</li> </ul>	Yes	Go to the next step.
		No	Repair suspected wiring harnesses, then go to Step 14.
8	<b>INSPECT IGNITION SYSTEM OPERATION</b> <ul style="list-style-type: none"> <li>Carry out spark test.</li> </ul> <p>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b>)</p> <ul style="list-style-type: none"> <li>Is strong blue spark visible at suspected cylinder?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace malfunctioning part according to spark test result.
			Then go to Step 14.
9	<b>INSPECT FOR AIR SUCTION AT INTAKE-AIR SYSTEM</b> <ul style="list-style-type: none"> <li>Inspect for air leakage at following: <ul style="list-style-type: none"> <li>Around connection of dynamic chamber and intake manifold</li> <li>Around connection of intake manifold and cylinder head</li> </ul> </li> <li>Is air leakage found?</li> </ul>	Yes	Repair or replace suspected part, then go to Step 14.
		No	Go to the next step.
10	<b>INSPECT FUEL INJECTOR WIRING HARNESS</b> <ul style="list-style-type: none"> <li>Remove intake air system parts.</li> </ul>	Yes	Go to the next step.

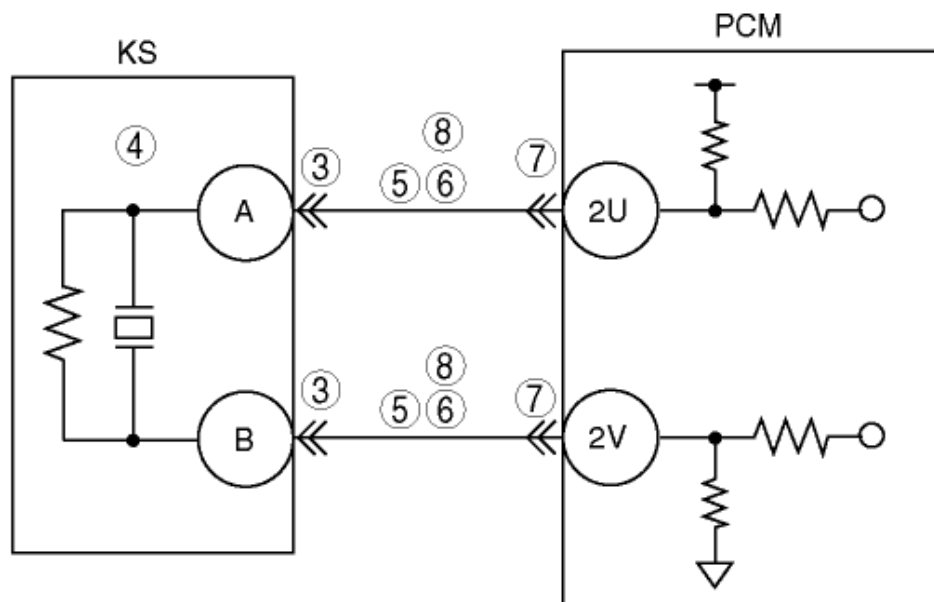
	<ul style="list-style-type: none"> <li>• Disconnect the fuel injector connector on suspected cylinder.</li> <li>• Connect NOID LIGHT to fuel injector terminals.</li> <li>• Inspect dim of light during cranking.</li> <li>• Does the light illuminate?</li> </ul>	No	<p>Inspect for fuel injector wiring harnesses.</p> <p>Repair or replace it if necessary, then go to Step 14.</p>
11	<b>INSPECT SEALING OF ENGINE COOLANT PASSAGE</b> <ul style="list-style-type: none"> <li>• Perform "ENGINE COOLANT LEAKAGE INSPECTION."</li> </ul> <p>(See <b>ENGINE COOLANT LEAKAGE INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>• Is there any malfunction?</li> </ul>	Yes	<p>Repair or replace malfunctioning part according to inspection results.</p> <p>Then go to Step 14.</p>
		No	Go to the next step.
12	<b>INSPECT ENGINE COMPRESSION</b> <ul style="list-style-type: none"> <li>• Inspect engine compression.</li> </ul> <p>(See <b>COMPRESSION INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>• Is engine compression normal?</li> </ul>	Yes	Go to the next step.
		No	Overhaul the engine, then go to the next step.
13	<b>INSPECT FUEL INJECTOR OPERATION</b> <ul style="list-style-type: none"> <li>• Remove the fuel injector from suspected cylinder.</li> <li>• Switch the injector with the injector on other cylinder.</li> <li>• Start the engine and idle it.</li> <li>• Is misfire DTC for cylinder which has a suspected fuel injector?</li> </ul>	Yes	<p>Replace the injector, then go to the next step.</p> <p>(See <b>FUEL INJECTOR REMOVAL/INSTALLATION [LF]</b>.)</p>
		No	Go to the next step.
14	<b>VERIFY TROUBLESHOOTING OF MISFIRE DTC COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Start the engine.</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Perform the KOER self-test (using M-MDS) or the HO2S heater, HO2S, and TWC Repair Verification Drive Mode (not using M-MDS).</li> </ul> <p>(See <b>KOEO/KOER SELF TEST [LF]</b>.)</p>	Yes	<p>Replace the PCM, then go to the next step.</p> <p>(See <b>PCM REMOVAL/INSTALLATION [LF]</b>.)</p>
		No	Go to the next step.

	<p>(See <b>OBD-II DRIVE MODE [LF].</b>)</p> <ul style="list-style-type: none"><li>Is the PENDING CODE for this DTC present?</li></ul>		
15	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"><li>Perform the "AFTER REPAIR PROCEDURE".</li></ul> <p>(See <b>AFTER REPAIR PROCEDURE [LF].</b>)</p> <ul style="list-style-type: none"><li>Are any DTC present?</li></ul>	Yes	Go to the applicable DTC troubleshooting. (See <b>DTC TABLE [LF].</b> )
		No	Troubleshooting completed.

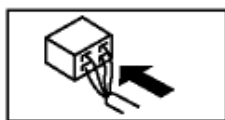
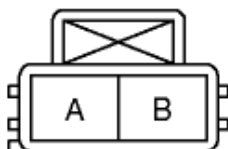
2008 - MX-5 - Engine

DTC P0327 [LF]

DTC P0327	KS circuit low input
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors input signal from the KS when the engine is running. If the input voltage is <b>below 0.01 V</b> the PCM determines that the KS circuit has a malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (CCM).</li><li>• The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• KS malfunction</li><li>• Connector or terminal malfunction</li><li>• Open circuit or short to ground in wiring harness between KS terminal A and PCM terminal 2U</li><li>• Open circuit or short to ground in wiring harness between KS terminal B and PCM terminal 2V</li><li>• Short KS two wires</li><li>• PCM malfunction</li></ul>

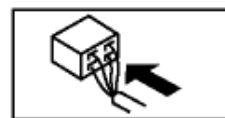


KS  
WIRING HARNESS-SIDE CONNECTOR



PCM  
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>INSPECT KS CONNECTOR TERMINAL</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> </ul>	Yes Repair the terminal, then go to Step 9.

	<ul style="list-style-type: none"> <li>• Disconnect the KS connector.</li> <li>• Inspect for poor connection at terminals A and B (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	No	Go to the next step.
4	<b>INSPECT KS</b> <ul style="list-style-type: none"> <li>• Perform KS inspection.</li> <li>(See <b>KNOCK SENSOR (KS) INSPECTION [LF]</b>)</li> <li>• Is KS normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the KS, then go to Step 9.  (See <b>KNOCK SENSOR (KS) REMOVAL/INSTALLATION [LF]</b> .)
5	<b>INSPECT KS CIRCUITS FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between the following terminals: <ul style="list-style-type: none"> <li>▪ KS terminal A (wiring harness-side) and body ground</li> <li>▪ KS terminal B (wiring harness-side) and body ground</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes	Repair or replace suspected wiring harness, then go to Step 9.
		No	Go to the next step.
6	<b>INSPECT FOR SHORT CIRCUITS</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between KS terminals A and B (wiring harness-side).</li> <li>• Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness, then go to Step 9.
		No	Go to the next step.
7	<b>INSPECT PCM CONNECTOR TERMINAL</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the PCM connector.</li> <li>• Inspect for poor connection at terminals 2U and 2V (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair terminal, then go to Step 9.
		No	Go to the next step.
8	<b>INSPECT KS CIRCUITS FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Disconnect the PCM connector.</li> <li>• Inspect for continuity between the following terminals: <ul style="list-style-type: none"> <li>▪ KS terminal A (wiring harness-side) and PCM terminal 2U (wiring harness-side)</li> <li>▪ KS terminal B (wiring harness-side) and PCM terminal 2V (wiring harness-</li> </ul> </li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to the next step.

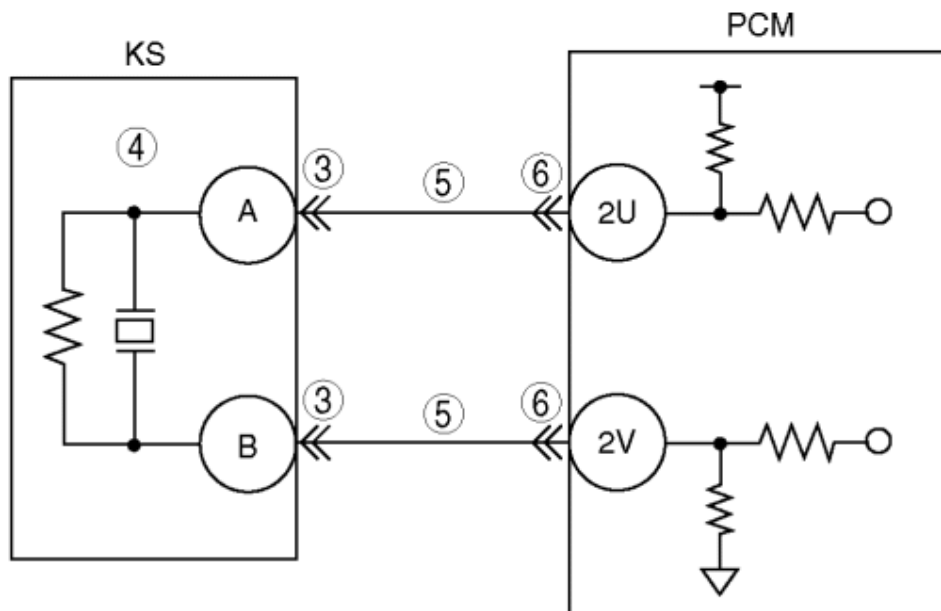
	side)		
	<ul style="list-style-type: none"> <li>Is there continuity?</li> </ul>		
9	<b>VERIFY TROUBLESHOOTING OF DTC P0327 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the memory using the M-MDS.</li> <li>Start the engine.</li> <li>Is the same DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step.  (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the “AFTER REPAIR PROCEDURE”. (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</li> <li>Are any DTC present?</li> </ul>	Yes	Go to the applicable DTC troubleshooting.  (See <a href="#">DTC TABLE [LF]</a> .)
		No	Troubleshooting completed.

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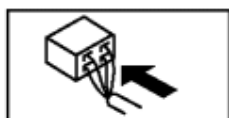
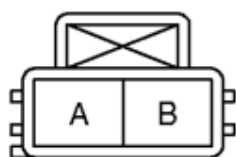
DTC P0328 [LF]

DTC P0328	KS circuit high input
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors the input signal from the KS when the engine is running. If the input voltage is <b>above 4.58 V</b> the PCM determines that KS circuit has a malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (CCM).</li><li>• The MIL illuminates if the PCM detects the above malfunction conditions during the first drive cycle.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• KS malfunction</li><li>• Connector or terminal malfunction</li><li>• Short to power supply in wiring harness between KS terminal A and PCM terminal 2U</li><li>• Short to power supply in wiring harness between KS terminal B and PCM terminal 2V</li><li>• PCM malfunction</li></ul>



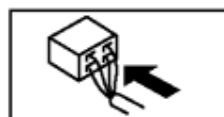


KS  
WIRING HARNESS-SIDE CONNECTOR



PCM  
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
	<b>INSPECT KS CONNECTOR TERMINAL</b>	

3	<ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect KS connector.</li> <li>• Inspect for poor connection at terminals A and B (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair the terminal, then go to Step 7.
		No	Go to the next step.
4	<b>INSPECT KS</b> <ul style="list-style-type: none"> <li>• Perform KS inspection. (See <b>KNOCK SENSOR (KS) INSPECTION [LF].</b>)</li> <li>• Is the KS normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the KS, then go to Step 7.  (See <b>KNOCK SENSOR (KS) REMOVAL/INSTALLATION [LF].</b> )
5	<b>INSPECT KS CIRCUITS FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position (Engine off).</li> <li>• Measure the voltage between KS terminal A (wiring harness-side) and body ground and KS terminal B (wiring harness-side) and body ground?</li> <li>• Is the voltage <b>B+</b>?</li> </ul>	Yes	Repair or replace wiring harness for short to power supply, then go to Step 7.
		No	Go to the next step.
6	<b>INSPECT PCM CONNECTOR</b> <ul style="list-style-type: none"> <li>• Disconnect PCM connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
7	<b>VERIFY TROUBLESHOOTING OF DTC P0328 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to connect all disconnected connectors.</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Start the engine.</li> <li>• Is the same DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step.  (See <b>PCM REMOVAL/INSTALLATION [LF].</b> )
		No	Go to the next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform the "AFTER REPAIR PROCEDURE". (See <b>AFTER REPAIR PROCEDURE [LF].</b>)</li> <li>• Are any DTC present?</li> </ul>	Yes	Go to the applicable DTC troubleshooting.  (See <b>DTC TABLE [LF].</b> )
		No	Troubleshooting completed.

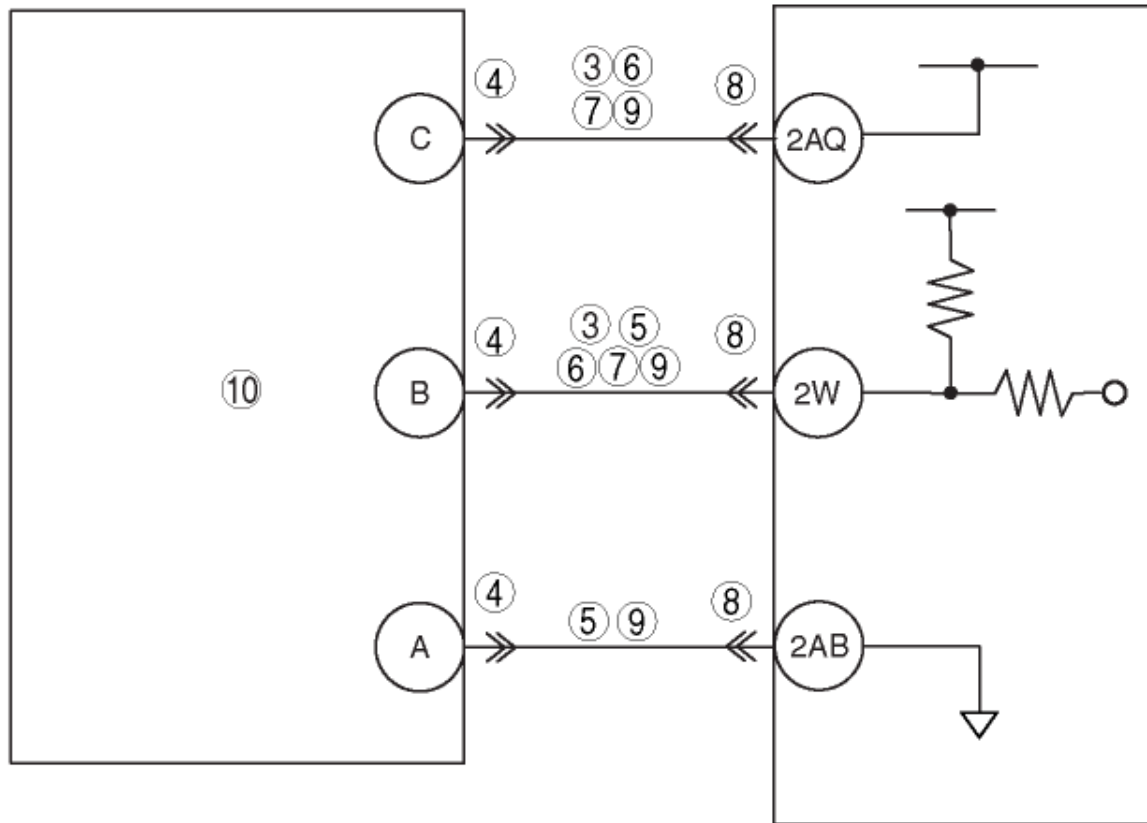
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### DTC P0335 [LF]

DTC P0335	CKP sensor circuit problem
DETECTION CONDITION	<ul style="list-style-type: none"><li>• If the PCM does not receive the input voltage from the CKP sensor for <b>4.2 s</b> while the MAF is <b>1.95 g/s {0.25 lb/min.} or above</b>, the PCM determines that the CKP sensor circuit has a malfunction.</li><li>• If a malfunction is detected in the input pulse pattern from the CKP sensor.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (CCM).</li><li>• The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• CKP sensor malfunction</li><li>• Connector or terminal malfunction</li><li>• CKP sensor is dirty.</li><li>• Short to power supply in wiring harness between CKP sensor terminal B and PCM terminal 2W</li><li>• Short to power supply in wiring harness between CKP sensor terminal A and PCM terminal 2AB</li><li>• Short to ground in wiring harness between CKP sensor terminal C and PCM terminal 2AQ</li><li>• Short to ground in wiring harness between CKP sensor terminal B and PCM terminal 2W</li><li>• Open circuit in wiring harness between CKP sensor terminal A and PCM terminal 2AB</li><li>• Open circuit in wiring harness between CKP sensor terminal B and PCM terminal 2W</li><li>• Open circuit in wiring harness between CKP sensor terminal C and PCM terminal 2AQ</li><li>• CKP sensor pulse wheel malfunction</li><li>• Both CKP sensor wires are shorted to each other</li><li>• PCM malfunction</li></ul>

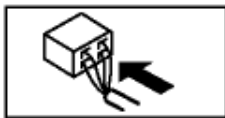
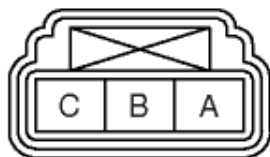
## CKP SENSOR

## PCM

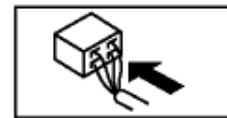


## CKP SENSOR WIRING HARNESS-SIDE CONNECTOR

## PCM WIRING HARNESS-SIDE CONNECTOR



2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.  No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b>	Yes Perform repair or diagnosis according to the available repair information.

	<ul style="list-style-type: none"> <li>• Verify related Service Bulletins and/or on-line repair information availability.</li> <li>• Is any related repair information available?</li> </ul>		<ul style="list-style-type: none"> <li>• If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<b>VERIFY CKP SENSOR VOLTAGE</b> <ul style="list-style-type: none"> <li>• Disconnect the CKP sensor connector.</li> <li>• Connect the voltmeter between the CKP sensor terminals B and C (sensor-side).</li> <li>• Inspect the voltage in the AC range while cranking the engine.</li> <li>• Is there any voltage?</li> </ul>	Yes	Go to the next step.
		No	Go to step 10.
4	<b>INSPECT CKP SENSOR CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Verify that the CKP sensor connector is connected securely.</li> <li>• Is connector normal?</li> </ul>	Yes	Go to the next step.
		No	Reconnect the connector, then go to Step 11.
5	<b>INSPECT CKP SENSOR CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off</li> <li>• Disconnect the CKP sensor connector.</li> <li>• Turn ignition switch to the ON position (Engine off).</li> <li>• Measure the voltage between the following terminals: <ul style="list-style-type: none"> <li>▪ CKP sensor terminal B (wiring harness-side) and body ground</li> <li>▪ CKP sensor terminal A (wiring harness-side) and body ground</li> </ul> </li> <li>• Is the voltage <b>B+</b>?</li> </ul>	Yes	Repair or replace the suspected wiring harness, then go to Step 11.
		No	Go to the next step.
6	<b>INSPECT CKP SENSOR CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between following terminal and body ground: <ul style="list-style-type: none"> <li>▪ CKP sensor terminal C (wiring harness-side)</li> <li>▪ CKP sensor terminal B (wiring harness-side)</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes	Repair or replace the suspected wiring harness, then go to Step 11.
		No	Go to the next step.
7	<b>INSPECT CKP SENSOR CIRCUITS FOR SHORT CIRCUIT</b>	Yes	Repair or replace the suspected wiring harness,

	<ul style="list-style-type: none"> <li>Inspect for continuity between CKP sensor terminals B and C (wiring harness-side).</li> <li>Is there continuity?</li> </ul>	then go to Step 11.
		No Go to the next step.
8	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Disconnect the PCM connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair the terminal, then go to Step 11. No Go to the next step.
9	<b>INSPECT CKP SENSOR CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for continuity between the following circuits: <ul style="list-style-type: none"> <li>CKP sensor terminal A (wiring harness-side) and PCM terminal 2AB (wiring harness-side)</li> <li>CKP sensor terminal B (wiring harness-side) and PCM terminal 2W (wiring harness-side)</li> <li>CKP sensor terminal C (wiring harness-side) and PCM terminal 2AQ</li> </ul> </li> <li>Are there continuity?</li> </ul>	Yes Go to Step 11. No Repair or replace the suspected wiring harness, then go to Step 11.
10	<b>INSPECT CKP SENSOR</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Perform the CKP sensor inspection. (See <a href="#">CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [LF]</a>.)</li> <li>Is the CKP sensor normal?</li> </ul>	Yes Go to the next step. No Inspect the CKP sensor pulse wheel for damage. Replace the CKP sensor pulse wheel and go to the next step. (See <a href="#">CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION [LF]</a> .)
11	<b>VERIFY TROUBLESHOOTING OF DTC P0335 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Turn ignition switch to the ON position (Engine off).</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Start the engine.</li> <li>Access the MAF PID using the M-MDS.</li> </ul> <p><b>NOTE:</b></p>	Yes Replace the PCM, then go to the next step. (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .) No Go to the next step.

	<ul style="list-style-type: none"> <li>The MAF PID should indicate <b>1.95 g/s {0.25 lb/min.}</b> or <b>above</b> during this test</li> <li>Is the same DTC present?</li> </ul>		
12	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the "After Repair Procedure". (See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</li> <li>Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.

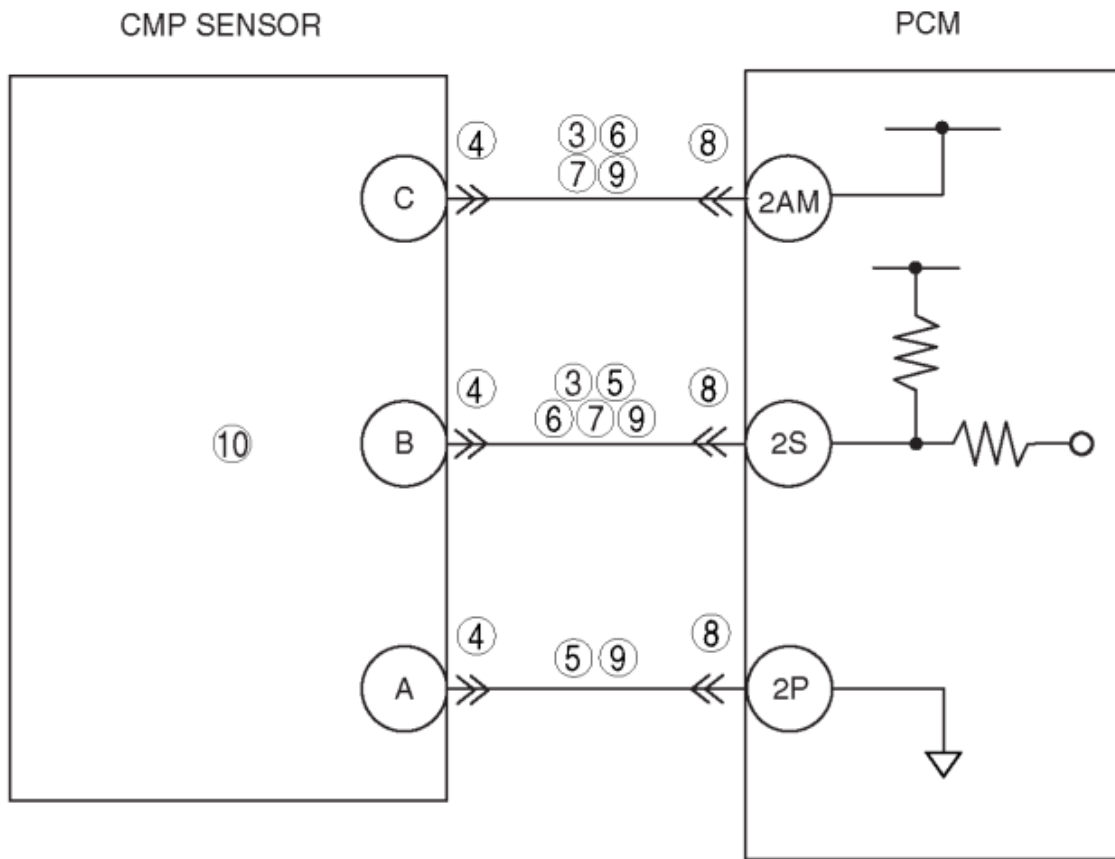
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DTC P0340 [LF]

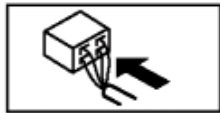
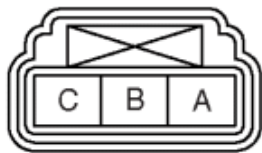
DTC P0340	CMP sensor circuit problem
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors the input voltage from the CMP sensor when the engine is running. If the PCM does not receive the input voltage from the CMP sensor while the PCM receives the input signal from the CKP sensor, the PCM determines that the CMP sensor circuit has a malfunction.</li><li>• If a malfunction is detected in the input pulse pattern from the CMP sensor.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (CCM).</li><li>• The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• CMP sensor malfunction</li><li>• Connector or terminal malfunction</li><li>• CMP sensor is dirty</li><li>• Short to power supply in wiring harness between CMP sensor terminal B and PCM terminal 2S</li><li>• Short to power supply in wiring harness between CMP sensor terminal A and PCM terminal 2P</li><li>• Short to ground circuit in wiring harness between CMP sensor terminal C and PCM terminal 2AM</li><li>• Short to ground circuit in wiring harness between CMP sensor terminal B and PCM terminal 2S</li><li>• Open circuit in wiring harness between CMP sensor terminal A and PCM terminal 2P</li><li>• Open circuit in wiring harness between CMP sensor terminal B and PCM terminal 2S</li><li>• Open circuit in wiring harness between CMP sensor terminal C and PCM terminal 2AM</li><li>• Both CMP sensor wires are shorted to each other</li><li>• CMP sensor pulse wheel malfunction</li><li>• CMP sensor misinstallation</li><li>• Timing chain misinstallation</li></ul>



- Loose timing chain or improper valve timing
- Loose camshaft sprocket lock bolt
- Loose crankshaft pulley lock bolt
- PCM malfunction

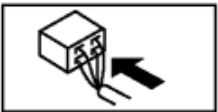


**CMP SENSOR**  
**WIRING HARNESS-SIDE CONNECTOR**



**PCM**  
**WIRING HARNESS-SIDE CONNECTOR**

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



**Diagnostic procedure**

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"><li>• Has FREEZE FRAME DATA been</li></ul>	YesGo to the next step.

	recorded?	No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>• Verify related Service Bulletins and/or on-line repair information availability.</li> <li>• Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>• If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<b>VERIFY CMP SENSOR VOLTAGE</b> <ul style="list-style-type: none"> <li>• Disconnect the CMP sensor connector.</li> <li>• Connect a voltmeter between CMP sensor terminals B and C (sensor-side).</li> <li>• Inspect the voltage in AC range while cranking the engine.</li> <li>• Is there any voltage?</li> </ul>	Yes	Go to the next step.
		No	Go to step 10.
4	<b>INSPECT CMP SENSOR CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Verify that the CMP sensor connector is connected securely.</li> <li>• Is the connector normal?</li> </ul>	Yes	Go to the next step.
		No	Reconnect the connector, then go to Step 15.
5	<b>INSPECT CMP SENSOR CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the CMP sensor connector.</li> <li>• Turn ignition switch to the ON position (Engine off)</li> <li>• Measure the voltage between the following terminals: <ul style="list-style-type: none"> <li>▪ CMP sensor terminal B (wiring harness-side) and body ground</li> <li>▪ CMP sensor terminal A (wiring harness-side) and body ground</li> </ul> </li> <li>• Is the voltage <b>B+</b>?</li> </ul>	Yes	Repair or replace the suspected wiring harness, then go to Step 15.
		No	Go to the next step.
6	<b>INSPECT CMP SENSOR CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between the following terminal and body ground: <ul style="list-style-type: none"> <li>▪ CMP sensor terminal B (wiring harness-side)</li> <li>▪ CMP sensor terminal C (wiring harness-side)</li> </ul> </li> </ul>	Yes	Repair or replace the suspected wiring harness, then go to Step 15.
		No	Go to the next step.

	<ul style="list-style-type: none"> <li>Is there continuity?</li> </ul>		
7	<b>INSPECT CMP SENSOR CIRCUITS FOR SHORT CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for continuity between CMP sensor terminals B and C (wiring harness-side).</li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace the suspected wiring harness, then go to Step 15.
		No	Go to the next step.
8	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Disconnect the PCM connector.</li> <li>Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair the terminal, then go to Step 15.
		No	Go to the next step.
9	<b>INSPECT CMP SENSOR CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for continuity between the following circuits: <ul style="list-style-type: none"> <li>CMP sensor terminal A (wiring harness-side) and PCM terminal 2P (wiring harness-side)</li> <li>CMP sensor terminal B (wiring harness-side) and PCM terminal 2S (wiring harness-side)</li> <li>CMP sensor terminal C (wiring harness-side) and PCM terminal 2AM (wiring harness-side)</li> </ul> </li> <li>Is there continuity?</li> </ul>	Yes	Go to Step 11.
		No	Repair or replace the suspected wiring harness, then go to Step 15.
10	<b>INSPECT CMP SENSOR</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Perform the CMP sensor inspection. (See <a href="#">CAMSHAFT POSITION (CMP) SENSOR INSPECTION [LF].</a>)</li> <li>Is the CMP sensor normal?</li> </ul>	Yes	Go to the Step 15.
		No	Replace the CMP sensor and go to Step 15. (See <a href="#">CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION [LF].</a> )
11	<b>VERIFY CMP SENSOR INSTALLATION</b> <ul style="list-style-type: none"> <li>Verify the CMP sensor installation. (See <a href="#">CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION [LF].</a>)</li> <li>Is the CMP sensor installed correctly?</li> </ul>	Yes	Go to the next step.
		No	Reinstall the CMP sensor and go to Step 15.
12	<b>VERIFY VALVE TIMING MECHANISM INSTALLATION</b> <ul style="list-style-type: none"> <li>Verify the valve timing mechanism</li> </ul>	Yes	Go to the next step.
		No	Reinstall the following parts and go to Step 15.

	<p>installation for the following parts:</p> <ul style="list-style-type: none"><li>▪ Timing chain misinstallation</li><li>▪ Loose camshaft sprocket lock bolt</li><li>▪ Loose crankshaft pulley lock bolt</li></ul> <ul style="list-style-type: none"><li>• Is the valve timing mechanism installed correctly?</li></ul>		<ul style="list-style-type: none"><li>• Timing chain</li><li>• Camshaft sprocket</li><li>• Crankshaft pulley</li></ul>
13	<b>INSPECT STOPPER PIN MECHANISM</b> <ul style="list-style-type: none"><li>• Remove the timing chain.</li><li>• Inspect the stopper pin.  (See <b>VARIABLE VALVE TIMING ACTUATOR INSPECTION [LF].</b>)</li><li>• Is the stopper pin mechanism normal?</li></ul>	Yes	Go to the next step.
		No	Replace the variable valve timing actuator, then go to Step 15.  (See <b>VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION [LF].</b> )
14	<b>INSPECT ROTOR POSITION</b> <ul style="list-style-type: none"><li>• Remove the variable valve timing actuator.  (See <b>VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION [LF].</b>)</li><li>• Is the rotor position at the maximum valve timing retard?</li></ul>	Yes	<b>VARIABLE VALVE TIMING MECHANISM NORMAL</b> <b>NOTE:</b> <ul style="list-style-type: none"><li>• This DTC is detected as an intermittent concern.</li><li>• The intermittent concern might be removed by cleaning the variable valve timing mode control function.</li></ul> Go to the next step.
		No	Replace the variable valve timing actuator, then go to the next step.  (See <b>VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION [LF].</b> )
15	<b>VERIFY TROUBLESHOOTING OF DTC P0340 COMPLETED</b> <ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Turn ignition switch to the ON position (Engine off).</li><li>• Clear the DTC from the PCM memory using the M-MDS.</li><li>• Start the engine.</li><li>• Access the MAF PID using the M-MDS.  <b>NOTE:</b><ul style="list-style-type: none"><li>• The MAF PID should indicate <b>1.95 g/s {0.25 lb/min.} or above</b> during this test</li></ul></li><li>• Is same DTC present?</li></ul>	Yes	Replace the PCM, then go to the next step.  (See <b>PCM REMOVAL/INSTALLATION [LF].</b> )
		No	Go to the next step.

16	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>Perform the "After Repair Procedure". (See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</li><li>Are any DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.

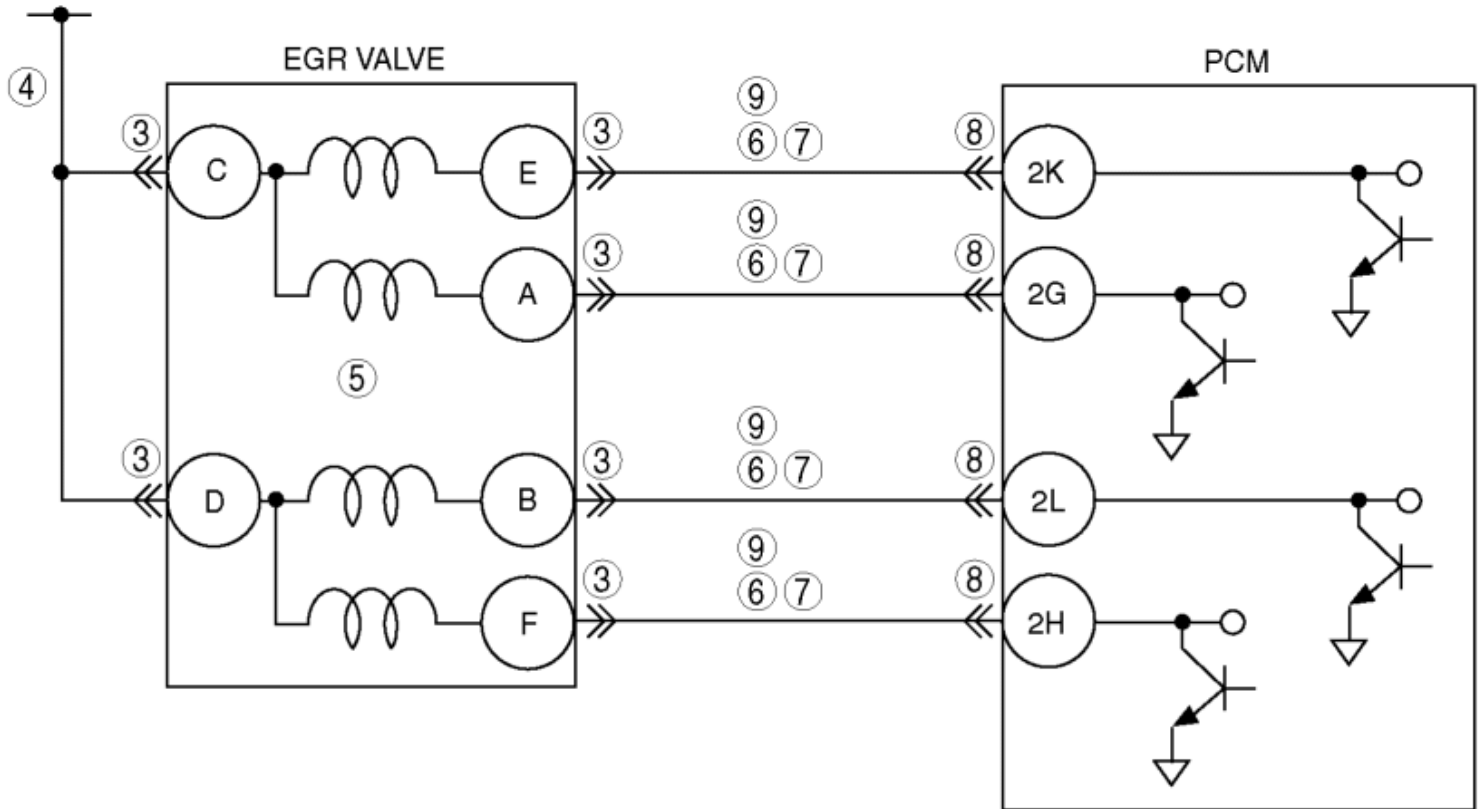
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DTC P0403 [LF]

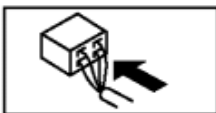
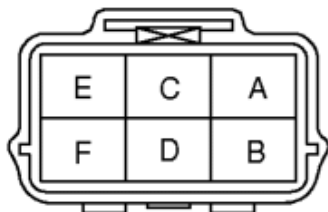
DTC P0403	EGR valve (stepping motor) circuit problem
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors the EGR valve control signal voltage and current. If the following conditions are met, the PCM determines that there is the EGR control circuit problem.<ul style="list-style-type: none"><li>▪ The PCM turns the EGR valve off, but the voltage of the EGR valve control signal remains low.</li><li>▪ The PCM turns the EGR valve on, but the current of the EGR valve control signal remains high.</li></ul></li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (CCM).</li><li>• The MIL illuminates if the PCM detects the above malfunction conditions in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• EGR valve malfunction</li><li>• Connector or terminal malfunction</li><li>• Short to power supply in wiring harness between EGR valve terminal E and PCM terminal 2K</li><li>• Short to power supply in wiring harness between EGR valve terminal A and PCM terminal 2G</li><li>• Short to power supply in wiring harness between EGR valve terminal B and PCM terminal 2L</li><li>• Short to power supply in wiring harness between EGR valve terminal F and PCM terminal 2H</li><li>• Short to ground circuit in wiring harness between EGR valve terminal E and PCM terminal 2K</li><li>• Short to ground circuit in wiring harness between EGR valve terminal A and PCM terminal 2G</li><li>• Short to ground circuit in wiring harness between EGR valve terminal B and PCM terminal 2L</li><li>• Short to ground circuit in wiring harness between EGR valve terminal F and PCM terminal 2H</li></ul>

- Open circuit in wiring harness between EGR valve terminal E and PCM terminal 2K
- Open circuit in wiring harness between EGR valve terminal A and PCM terminal 2G
- Open circuit in wiring harness between EGR valve terminal B and PCM terminal 2L
- Open circuit in wiring harness between EGR valve terminal F and PCM terminal 2H
- Open circuit in wiring harness between main relay and EGR valve terminal C
- Open circuit in wiring harness between main relay and EGR valve terminal D
- PCM malfunction

#### MAIN RELAY

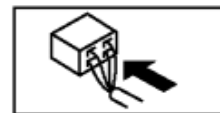


#### EGR VALVE WIRING HARNESS-SIDE CONNECTOR



#### PCM WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



#### Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<b>INSPECT EGR VALVE FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect EGR valve connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminals and/or connector, then go to Step 10.
		No	Go to the next step.
4	<b>INSPECT POWER CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Measure the voltage following terminal and body ground.               <ul style="list-style-type: none"> <li>EGR valve terminal C</li> <li>EGR valve terminal D</li> </ul> </li> <li>Is the voltage <b>B+</b>?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit then go to Step 10.
5	<b>INSPECT EGR VALVE</b> <ul style="list-style-type: none"> <li>Inspect the EGR valve. (See <a href="#">EGR VALVE INSPECTION [LF]</a>.)</li> <li>Is the EGR valve normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the EGR valve, then go to Step 10. (See <a href="#">EGR VALVE REMOVAL/INSTALLATION [LF]</a> .)
6	<b>INSPECT FOR CONTROL CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Inspect for continuity between the following terminal and body ground:               <ul style="list-style-type: none"> <li>EGR valve terminal E</li> <li>EGR valve terminal A</li> <li>EGR valve terminal B</li> <li>EGR valve terminal F</li> </ul> </li> <li>is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness for short to ground, then go to Step 10.
		No	Go to the next step.



7	<b>INSPECT FOR CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position (Engine off).</li> <li>• Measure the voltage following terminal and body ground: <ul style="list-style-type: none"> <li>▪ EGR valve terminal E</li> <li>▪ EGR valve terminal A</li> <li>▪ EGR valve terminal B</li> <li>▪ EGR valve terminal F</li> </ul> </li> <li>• Is the voltage <b>B+</b>?</li> </ul>		Yes Repair or replace the wiring harness for short to power supply, then go to Step 10.  No Go to the next step.
8	<b>INSPECT PCM FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the PCM connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>		Yes Repair or replace the terminals and/or connector, then go to Step 10.  No Go to the next step.
9	<b>INSPECT CONTROL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Remove the PCM with the PCM connector connected.</li> <li>• Inspect for continuity following terminals: <ul style="list-style-type: none"> <li>▪ Between EGR valve terminal E and PCM terminal 2K</li> <li>▪ Between EGR valve terminal A and PCM terminal 2G</li> <li>▪ Between EGR valve terminal B and PCM terminal 2L</li> <li>▪ Between EGR valve terminal F and PCM terminal 2H</li> </ul> </li> <li>• Is there continuity?</li> </ul>		Yes Go to the next step.  No Repair or replace the wiring harness for an open circuit then go to the next step.
10	<b>VERIFY TROUBLESHOOTING OF DTC P0403 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Start the engine.</li> <li>• Is the PENDING CODE for this DTC present?</li> </ul>		Yes Replace the PCM, then go to the next step.  (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)  No Go to the next step.

11	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>Perform the "AFTER REPAIR PROCEDURE".</li></ul> (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a> .) <ul style="list-style-type: none"><li>Are any DTC present?</li></ul>	Yes	Go to the applicable DTC troubleshooting. (See <a href="#">DTC TABLE [LF]</a> .)
		No	Troubleshooting completed.

2008 - MX-5 - Engine

DTC P0421 [LF]

DTC P0421	Warm up catalyst system efficiency below threshold
DETECTION CONDITION	<div><ul style="list-style-type: none"><li>PCM compares number of front HO2S and rear HO2S inversions for a predetermined time. PCM monitors number of inversions rear side performs while front side inverts for a specified number of times when the following monitoring conditions are met, PCM detects inversion ratio. If inversion ratio is below threshold, PCM determines that catalyst has deteriorated.</li></ul></div> <div>MONITORING CONDITION</div> <div><ul style="list-style-type: none"><li>Calculated TWC temperature: <b>more than 400 °C {752 °F}</b></li><li>Engine speed: <b>1,500— 3,000 rpm</b></li><li>LOAD: <b>15— 48 %</b> (at engine speed 2,000 rpm)</li></ul></div> <div>Diagnostic support note</div> <div><ul style="list-style-type: none"><li>This is an intermittent monitor (Catalyst).</li><li>The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>DIAGNOSTIC MONITORING TEST RESULTS is available.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul></div>
POSSIBLE CAUSE	<div><ul style="list-style-type: none"><li>TWC deterioration or malfunction</li><li>Exhaust gas leakage</li><li>Loose front HO2S</li><li>Loose rear HO2S</li><li>PCM malfunction</li></ul></div>

Diagnostic procedure

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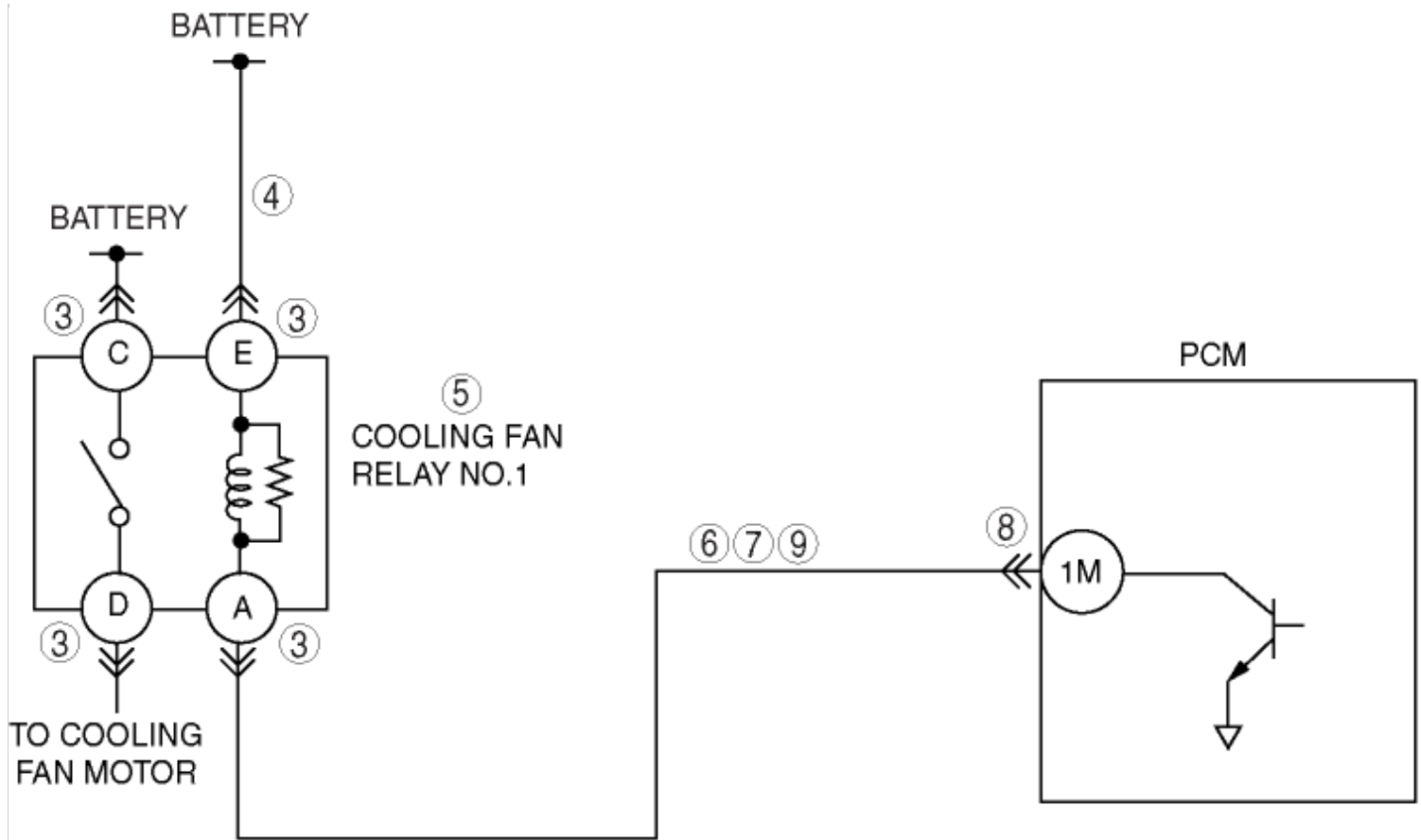
STEP	INSPECTION		ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Catalyst related) been recorded?</li> </ul>	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<b>VERIFY RELATED PENDING CODE OR STORED DTC</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off, then to the ON position (Engine off).</li> <li>Verify the related PENDING CODE or stored DTCs.</li> <li>Are other DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .)
		No	Go to the next step.
4	<b>INSPECT EXHAUST SYSTEM FOR EXHAUST GAS LEAKAGE</b> <ul style="list-style-type: none"> <li>Visually inspect exhaust gas leakage in the exhaust system.</li> <li>Is there exhaust gas leakage?</li> </ul>	Yes	Repair or replace the malfunctioning part, then go to Step 7. (See <a href="#">EXHAUST SYSTEM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
5	<b>INSPECT INSTALLATION OF REAR HO2S</b> <ul style="list-style-type: none"> <li>Inspect the rear HO2S for looseness.</li> <li>Is it normal?</li> </ul>	Yes	Go to the next step.
		No	Retighten the sensor, then go to Step 7. (See <a href="#">REAR HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]</a> .)
6	<b>INSPECT TWC</b> <ul style="list-style-type: none"> <li>Clear the DTC using the M-MDS generic OBD function.</li> <li>Turn the ignition switch off then back to the ON position.</li> <li>Inspect the TWC. <ul style="list-style-type: none"> <li>(See <a href="#">WARM-UP</a></li> </ul> </li> </ul>	Yes	Replace the HO2S, then go to the next step. (See <a href="#">FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]</a> .) (See <a href="#">REAR HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]</a> .)
		No	Replace the TWC, then go to the next step.

	<p><b>THREE-WAY CATALYTIC CONVERTER (WU-TWC) INSPECTION [LF].)</b></p> <ul style="list-style-type: none"> <li>Is it normal?</li> </ul>		(See <b>EXHAUST SYSTEM REMOVAL/INSTALLATION [LF].)</b>
7	<p><b>VERIFY TROUBLESHOOTING OF DTC P0421 COMPLETED</b></p> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Clear the DTC from the memory using the M-MDS.</li> <li>Perform the HO2S heater, HO2S, and TWC Repair Verification Drive Mode.</li> </ul> <p>(See <b>OBD-II DRIVE MODE [LF].)</b></p> <ul style="list-style-type: none"> <li>Is the PENDING CODE for this DTC present?</li> </ul>	Yes	<p>Replace the PCM, then go to the next step.</p> <p>(See <b>PCM REMOVAL/INSTALLATION [LF].)</b></p>
		No	Go to the next step.
8	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"> <li>Perform the "AFTER REPAIR PROCEDURE".</li> </ul> <p>(See <b>AFTER REPAIR PROCEDURE [LF].)</b></p> <ul style="list-style-type: none"> <li>Are any DTC present?</li> </ul>	Yes	<p>Go to the applicable DTC troubleshooting.</p> <p>(See <b>DTC TABLE [LF].)</b></p>
		No	Troubleshooting completed.

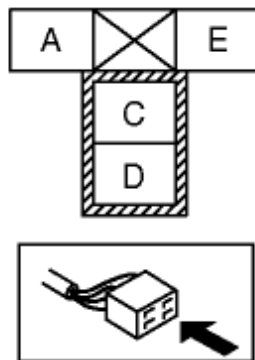
## 2008 - MX-5 - Engine

### DTC P0480 [LF]

DTC P0480	Cooling fan relay No.1 control circuit malfunction
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors the cooling fan relay No.1 control signal voltage and current. If the following conditions are met, the PCM determines that there is the cooling fan relay No.1 control circuit problem.<ul style="list-style-type: none"><li>▪ The PCM turns the cooling fan relay No.1 off, but the voltage of the cooling fan relay No.1 control signal remains low.</li><li>▪ The PCM turns the cooling fan relay No.1 on, but the current of the cooling fan relay No.1 control signal remains high.</li></ul></li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (Other).</li><li>• The MIL does not illuminate.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Cooling fan relay No.1 malfunction</li><li>• Connector or terminal malfunction</li><li>• Open circuit in wiring harness between battery positive terminal and cooling fan relay No.1 terminal E</li><li>• Open circuit in wiring harness between cooling fan relay No.1 terminal A and PCM terminal 1M</li><li>• Short to ground in wiring harness between cooling fan relay No.1 terminal A and PCM terminal 1M</li><li>• Short to power supply between cooling fan relay No.1 terminal A and PCM terminal 1M</li><li>• PCM malfunction</li></ul>

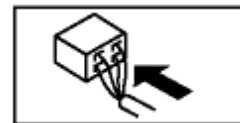


COOLING FAN RELAY NO.1  
HARNESS SIDE CONNECTOR



PCM  
HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	<p>Yes Go to next step.</p> <p>No Record the FREEZE FRAME DATA on the repair order, then go to next step.</p>

2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>• Verify related Service Bulletins and/or on-line repair information availability.</li> <li>• Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>• If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>INSPECT COOLING FAN RELAY NO.1 CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn ignition switch to OFF.</li> <li>• Disconnect cooling fan relay No.1 connector.</li> <li>• Inspect for poor connection (such as damaged, pulled-out pins, corrosion, etc.).</li> <li>• Is there any malfunction?</li> </ul>	Yes Repair or replace terminal and/or connector, then go to Step 10.
		No Go to next step.
4	<b>INSPECT COOLING FAN RELAY NO.1 POWER CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Turn ignition key to ON (Engine OFF).</li> <li>• Measure voltage between cooling fan relay No.1 terminal E (harness side) and body ground.</li> <li>• Is voltage <b>B+</b>?</li> </ul>	Yes Go to next step.
		No Replace or replace harness for open circuit, then go to Step 10.
5	<b>INSPECT COOLING FAN RELAY NO.1</b> <ul style="list-style-type: none"> <li>• Inspect cooling fan relay No.1. (See <a href="#">RELAY INSPECTION</a>.)</li> <li>• Is cooling fan relay No.1 okay?</li> </ul>	Yes Go to next step.
		No Replace cooling fan relay No.1, then go to Step 10.
6	<b>INSPECT COOLING FAN RELAY NO.1 CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>• Measure voltage between cooling fan relay No.1 terminal A (harness-side) and body ground.</li> <li>• Is voltage <b>B+</b>?</li> </ul>	Yes Repair or replace harness for short to power supply, then go to Step 10.
		No Go to next step.
7	<b>INSPECT COOLING FAN RELAY NO.1 CONTROL CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Inspect continuity between cooling fan relay No.1 terminal A (harness side) and body ground.</li> <li>• Is there continuity?</li> </ul>	Yes Repair or replace harness for open circuit, then go to Step 10.
		No Go to next step.
8	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b>	Yes Repair or replace terminal and/or

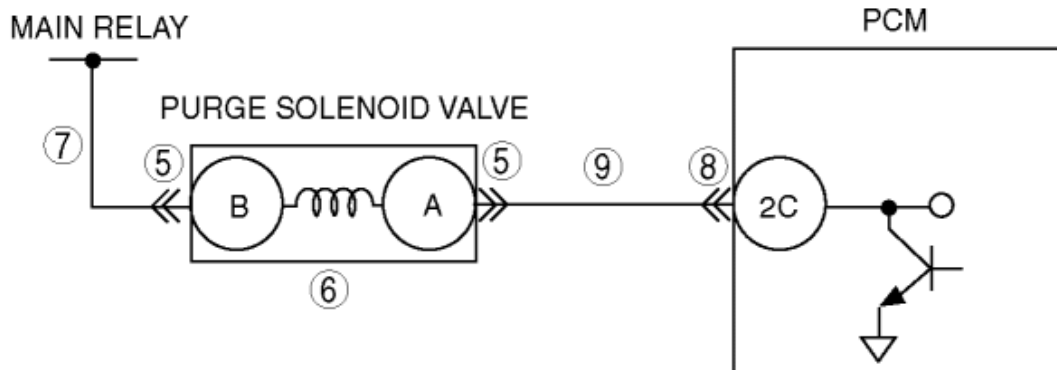


	<ul style="list-style-type: none"> <li>• Turn ignition switch to off.</li> <li>• Disconnect PCM connector.</li> <li>• Inspect for poor connection (such as damaged, pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	connector, then go to Step 10.
		No Go to next step.
9	<b>INSPECT COOLING FAN RELAY NO.1 CONTROL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Inspect continuity between cooling fan relay No.1 terminal A (harness-side) and PCM terminal 1M (harness-side).</li> <li>• Is there continuity?</li> </ul>	Yes Go to next step.
		No Repair or replace harness for open circuit, then go to next step.
10	<b>VERIFY TROUBLESHOOTING OF DTC P0480 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Clear DTC from PCM memory using M-MDS.</li> <li>• Perform the KOEO self-test with M-MDS, or following procedures.  (See <b>KOEO/KOER SELF TEST [LF]</b>.)               <ul style="list-style-type: none"> <li>▪ Access ECT PID.</li> <li>▪ Start engine and warm up it until ECT PID <b>above 100 °C {212 °F}</b></li> <li>▪ Retrieve any DTC.</li> </ul> </li> <li>• Is PENDING CODE for this DTC present?</li> </ul>	Yes Replace PCM, then go to next step.  (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)
		No Go to next step.
11	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform "After Repair Procedure".  (See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</li> <li>• Is any DTC present?</li> </ul>	Yes Go to applicable DTC inspection.  (See <b>DTC TABLE [LF]</b> .)
		No Troubleshooting completed.

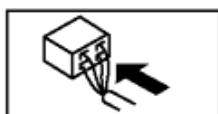
2008 - MX-5 - Engine

DTC P0443 [LF]

DTC P0443	Purge solenoid valve circuit problem
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors the purge solenoid valve control signal voltage and current. If the following conditions are met, the PCM determines that there is the purge solenoid valve control circuit problem.<ul style="list-style-type: none"><li>▪ The PCM turns the purge solenoid valve off, but the voltage of the purge solenoid valve control signal remains low.</li><li>▪ The PCM turns the purge solenoid valve on, but the current of the purge solenoid valve control signal remains high.</li></ul></li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (CCM).</li><li>• The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Purge solenoid valve malfunction</li><li>• Connector or terminal malfunction</li><li>• Short to ground in wiring harness between purge solenoid valve terminal A and PCM terminal 2C</li><li>• Open circuit in wiring harness between main relay and purge solenoid valve terminal B</li><li>• Open circuit in wiring harness between purge solenoid valve terminal A and PCM terminal 2C</li><li>• Short to power supply in wiring harness between purge solenoid valve terminal A and PCM terminal 2C</li><li>• PCM malfunction</li></ul>

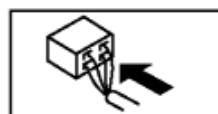


PURGE SOLENOID VALVE  
WIRING HARNESS-SIDE CONNECTOR



PCM  
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>CLASSIFY OPEN CIRCUIT OR SHORT TO GROUND MALFUNCTION</b> <ul style="list-style-type: none"> <li>Disconnect purge solenoid valve tube that is connected to intake manifold.</li> <li>Connect vacuum pump to purge solenoid valve.</li> <li>Pump vacuum pump several times and stop.</li> <li>Wait a few seconds.</li> </ul>	Yes Go to Step 5.
		No Go to the next step.

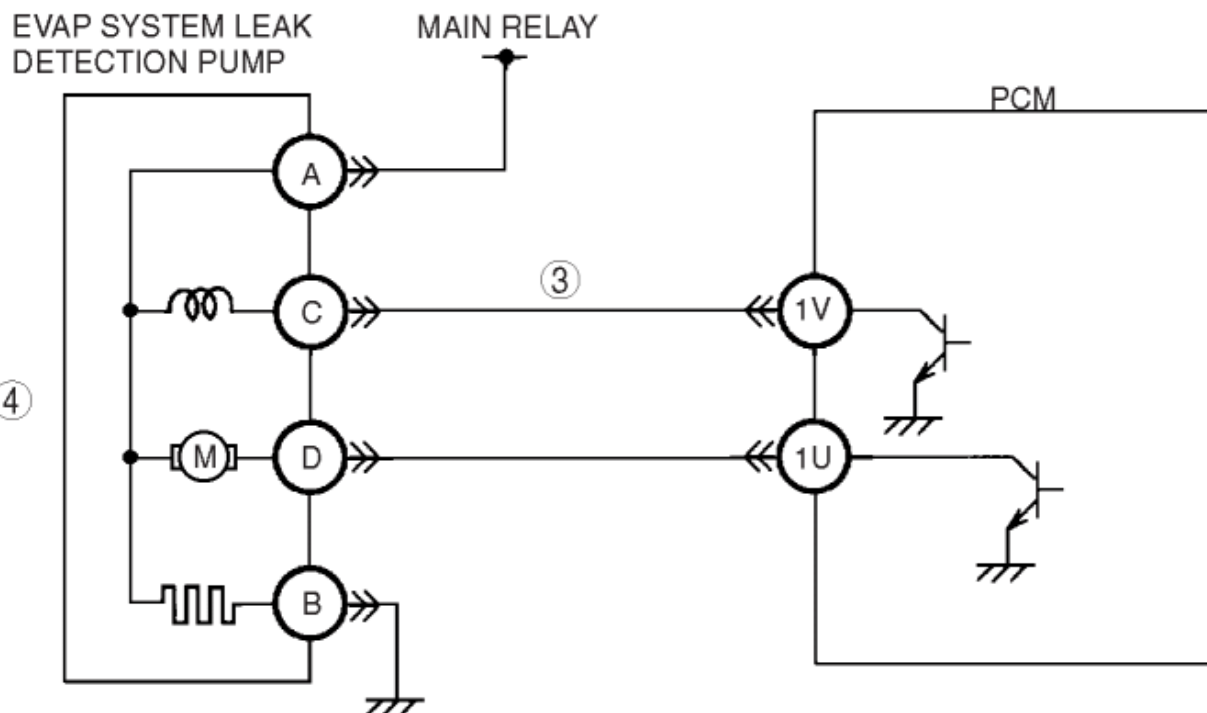
	<ul style="list-style-type: none"> <li>Is vacuum maintained?</li> </ul>		
4	<b>INSPECT PASSAGE CONTROL OF PURGE SOLENOID VALVE</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect purge solenoid valve connector.</li> <li>Pump vacuum pump several times and wait <b>a few seconds</b>.</li> <li>Is vacuum maintained?</li> </ul>	Yes Repair or replace wiring harness for short to ground, then go to Step 10.	
		No Replace the purge solenoid valve, then go to Step 10. (See <b>PURGE SOLENOID VALVE REMOVAL/INSTALLATION [LF]</b> .)	
5	<b>INSPECT PURGE SOLENOID VALVE CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there malfunction?</li> </ul>	Yes Repair or replace the terminal, then go to Step 10.	
		No Go to the next step.	
6	<b>INSPECT PURGE SOLENOID VALVE</b> <ul style="list-style-type: none"> <li>Perform the purge solenoid valve inspection. (See <b>PURGE SOLENOID VALVE INSPECTION [LF]</b>.)</li> <li>Is purge solenoid valve normal?</li> </ul>	Yes Go to the next step.	
		No Replace the purge solenoid valve, then go to Step 10. (See <b>PURGE SOLENOID VALVE REMOVAL/INSTALLATION [LF]</b> .)	
7	<b>INSPECT PURGE SOLENOID VALVE POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Measure the voltage between purge solenoid valve terminal B and body ground.</li> <li>Is the voltage <b>B+</b>?</li> </ul>	Yes Go to the next step.	
		No Repair or replace the wiring harness for an open circuit, then go to Step 10.	
8	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the PCM connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there malfunction?</li> </ul>	Yes Repair or replace the terminal, then go to Step 10.	
		No Go to the next step.	
9	<b>INSPECT PURGE SOLENOID VALVE CONTROL CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Measure the voltage between</li> </ul>	Yes Repair or replace the wiring harness for short to power supply, then go to the next step.	
		No Inspect the harness at between purge solenoid valve terminal A (wiring harness-side) and PCM terminal 2C (wiring harness-side) for open or short circuit.	

	<p>purge solenoid valve terminal A (wiring harness-side) and body ground.</p> <ul style="list-style-type: none"> <li>Is the voltage <b>B+</b>?</li> </ul>		<ul style="list-style-type: none"> <li>If there is continuity, go to the next step.</li> <li>If there is no continuity, repair or replace the wiring harness for an open circuit, then go to the next step.</li> </ul>
10	<b>VERIFY TROUBLESHOOTING OF DTC P0443 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Start the engine.</li> <li>Is the PENDING CODE for this DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step. (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
11	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the "AFTER REPAIR PROCEDURE".</li> </ul> (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a> .) <ul style="list-style-type: none"> <li>Are any DTC present?</li> </ul>	Yes	Go to the applicable DTC troubleshooting. (See <a href="#">DTC TABLE [LF]</a> .)
		No	Troubleshooting completed.

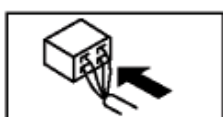
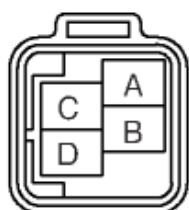
2008 - MX-5 - Engine

DTC P0446 [LF]

DTC P0446	Change over valve (COV) (EVAP system leak detection pump) stuck close
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors pump load current (EVAP line pressure), while evaporative leak monitor is operating. When the decrease in pump load current is less than the specification after the reference current value has been obtained, the PCM determines change over valve (COV) in EVAP system leak detection pump has a malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is an intermittent monitor (CCM).</li><li>• The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Damaged COV (in EVAP system leak detection pump.)</li><li>• Short to power circuit between the EVAP system leak detection pump terminal C and PCM terminal 1V</li><li>• Damaged PCM</li></ul>

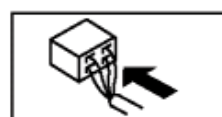


EVAP SYSTEM LEAK DETECTION PUMP  
WIRING HARNESS-SIDE CONNECTOR



PCM  
HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAVE BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Have FREEZE FRAME DATA been recorded?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Record the FREEZE FRAME DATA on the repair order, then go to the next step.</p>
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	<p>Yes Perform repair or diagnosis according to the available repair information.</p> <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> <p>No Go to the next step.</p>

3	<b>INSPECT COV CONTROL (EVAP SYSTEM LEAK DETECTION PUMP) CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position (Engine off).</li> <li>• Disconnect the EVAP system leak detection pump connector.</li> <li>• Measure the voltage between EVAP system leak detection pump connector terminal C (wiring harness-side) and body ground.</li> <li>• Is the voltage <b>B+</b>?</li> </ul>	Yes	Repair or replace the wiring harness, then go to Step 5.
		No	Go to the next step.
4	<b>INSPECT COV (EVAP SYSTEM LEAK DETECTION PUMP)</b> <ul style="list-style-type: none"> <li>• Inspect the EVAP system leak detection pump. (See <b>EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION [LF]</b>.)</li> <li>• Is the COV (EVAP system leak detection pump) normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the EVAP system leak detection pump, then go to the next step.  (See <b>EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP REMOVAL/INSTALLATION [LF]</b> .)
5	<b>VERIFY TROUBLESHOOTING OF DTC P0446 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Turn the ignition switch to the ON position (Engine off)</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Perform the evaporative emission test using the M-MDS. (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b>.)</li> <li>• Is the same DTC present?</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• If evaporative system test function is not available, perform the following procedure:               <ul style="list-style-type: none"> <li>▪ Perform the EVAP System Repair Verification Drive Mode. (See <b>OBD-II DRIVE MODE [LF]</b>)</li> <li>▪ Is the PENDING CODE the same as the DTC present?</li> </ul> </li> </ul>	Yes	Replace the PCM, then go to the next step. (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)
		No	Go to the next step.
6	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform "AFTER REPAIR PROCEDURE". (See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</li> <li>• Is any DTC present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.

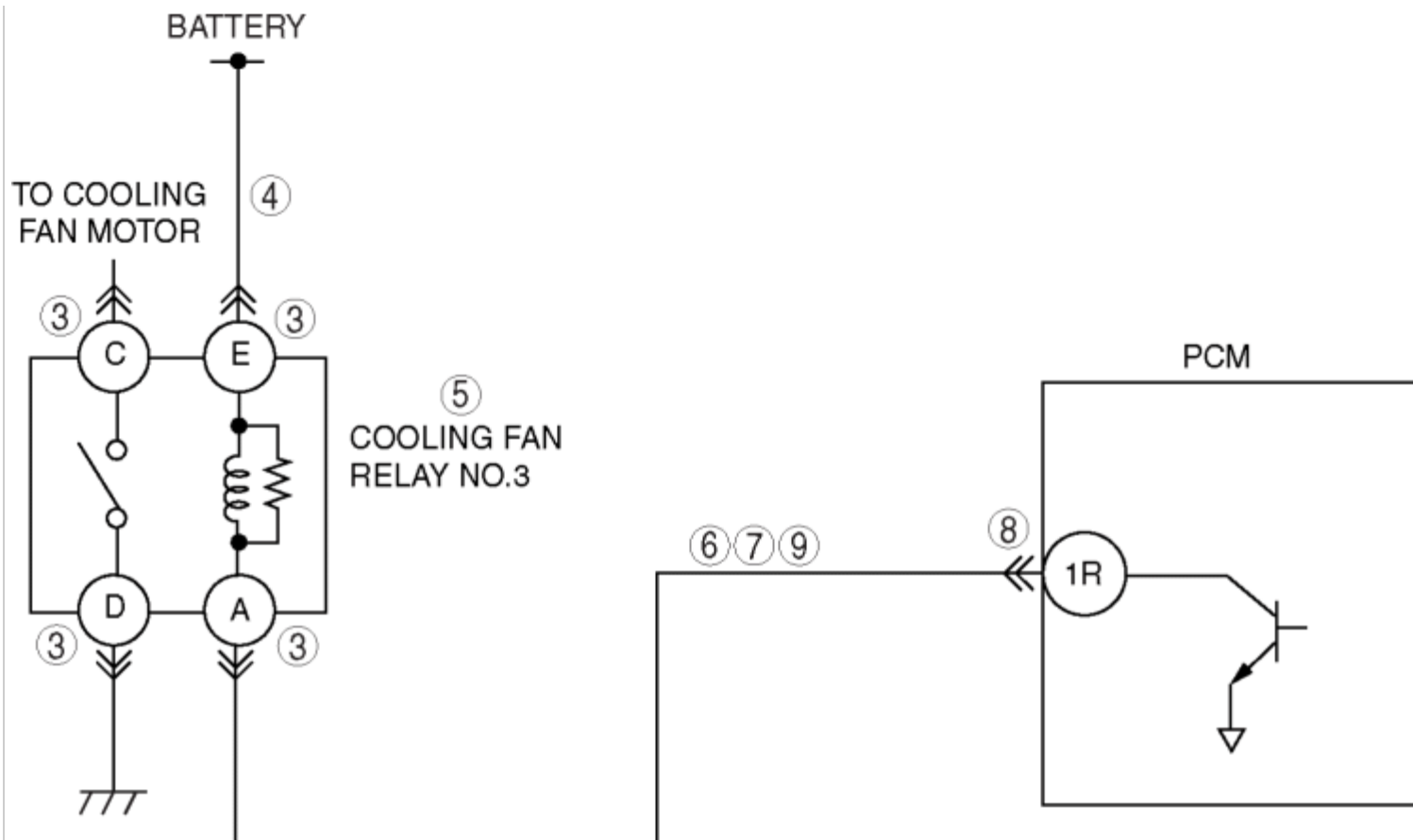




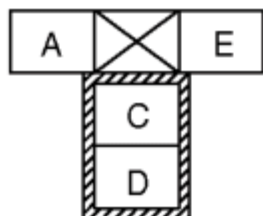
## 2008 - MX-5 - Engine

### DTC P0482 [LF]

DTC P0482	Cooling fan relay No.3 control circuit malfunction
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors the cooling fan relay No.3 control signal voltage and current. If the following conditions are met, the PCM determines that there is the cooling fan relay No.3 control circuit problem.<ul style="list-style-type: none"><li>▪ The PCM turns the cooling fan relay No.3 off, but the voltage of the cooling fan relay No.3 control signal remains low.</li><li>▪ The PCM turns the cooling fan relay No.3 on, but the current of the cooling fan relay No.3 control signal remains high.</li></ul></li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (Other).</li><li>• The MIL does not illuminate.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Cooling fan relay No.3 malfunction</li><li>• Connector or terminal malfunction</li><li>• Open circuit in wiring harness between battery positive terminal and cooling fan relay No.3 terminal E</li><li>• Open circuit in wiring harness between cooling fan relay No.3 terminal A and PCM terminal 1R</li><li>• Short to ground in wiring harness between cooling fan relay No.3 terminal A and PCM terminal 1R</li><li>• Short to power supply in wiring harness between cooling fan relay No.3 terminal A and PCM terminal 1R</li><li>• PCM malfunction</li></ul>

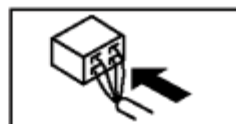


COOLING FAN RELAY NO.3  
HARNESS SIDE CONNECTOR



PCM  
HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	<p>Yes Go to next step.</p> <p>No Record the FREEZE FRAME DATA on the repair order, then go to next step.</p>

2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>• Verify related Service Bulletins and/or on-line repair information availability.</li> <li>• Is any related repair information available?</li> </ul>	<div> Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>• If the vehicle is not repaired, go to the next step.</li> </ul> </div> <div> No Go to the next step. </div>
3	<b>INSPECT COOLING FAN RELAY NO.3 CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn ignition switch to off.</li> <li>• Disconnect cooling fan relay No.3 connector.</li> <li>• Inspect for poor connection (such as damaged, pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	<div> Yes Repair or replace terminal and/or connector, then go to Step 10. </div> <div> No Go to next step. </div>
4	<b>INSPECT COOLING FAN RELAY NO.3 POWER CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Turn ignition key to ON (Engine OFF).</li> <li>• Measure voltage between cooling fan relay No.3 terminal E (harness-side) and body ground.</li> <li>• Is voltage <b>B+</b>?</li> </ul>	<div> Yes Go to next step. </div> <div> No Replace or replace harness for open circuit, then go to Step 10. </div>
5	<b>INSPECT COOLING FAN RELAY NO.3</b> <ul style="list-style-type: none"> <li>• Inspect cooling fan relay No.3. (See <a href="#">RELAY INSPECTION</a>.)</li> <li>• Is cooling fan relay No.3 okay?</li> </ul>	<div> Yes Go to next step. </div> <div> No Replace cooling fan relay No.3, then go to Step 10. </div>
6	<b>INSPECT COOLING FAN RELAY NO.3 CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>• Measure voltage between cooling fan relay No.3 terminal A (harness-side) and body ground.</li> <li>• Is voltage <b>B+</b>?</li> </ul>	<div> Yes Repair or replace harness for short to power supply, then go to Step 10. </div> <div> No Go to next step. </div>
7	<b>INSPECT COOLING FAN RELAY NO.3 CONTROL CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Inspect continuity between cooling fan relay No.3 terminal A (harness-side) and body ground.</li> <li>• Is there continuity?</li> </ul>	<div> Yes Repair or replace harness for open circuit, then go to Step 10. </div> <div> No Go to next step. </div>
	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b>	

8	<ul style="list-style-type: none"> <li>• Turn ignition switch to off.</li> <li>• Disconnect PCM connector.</li> <li>• Inspect for poor connection (such as damaged, pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace terminal and/or connector, then go to Step 10.
		No	Go to next step.
9	<b>INSPECT COOLING FAN RELAY NO.3 CONTROL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Inspect continuity between cooling fan relay No.3 terminal A (harness-side) and PCM terminal 1R (harness-side).</li> <li>• Is there continuity?</li> </ul>	Yes	Go to next step.
		No	Repair or replace harness for open circuit, then go to next step.
10	<b>VERIFY TROUBLESHOOTING OF DTC P0482 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Clear DTC from PCM memory using M-MDS.</li> <li>• Perform the KOEO self-test with M-MDS, or following procedures. (See <a href="#">KOEO/KOER SELF TEST [LF]</a>.) <ul style="list-style-type: none"> <li>▪ Access ECT PID.</li> <li>▪ Start engine and warm up it until ECT PID <b>above 100 °C {212 °F}</b></li> <li>▪ Retrieve any DTC.</li> </ul> </li> <li>• Is PENDING CODE for this DTC present?</li> </ul>	Yes	Replace PCM, then go to next step.  (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to next step.
11	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform "After Repair Procedure". (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</li> <li>• Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection.  (See <a href="#">DTC TABLE [LF]</a> .)
		No	Troubleshooting completed.

## 2008 - MX-5 - Engine

### DTC P0461 [LF]

DTC P0461	Fuel gauge sender unit range/performance problem
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors the fuel tank level difference before and after the PCM-calculated fuel consumption has reached <b>more than 25 L {26.4 US qt, 22 Imp qt}</b>. If the difference is <b>less than 5%</b>, the PCM determines that there is a fuel gauge sender unit range/performance problem.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Fuel gauge sender unit malfunction</li> <li>Instrument cluster malfunction</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b>	Yes Perform repair or diagnosis according to the available repair information.
	<ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information</li> </ul>	<ul style="list-style-type: none"> <li>If the vehicle is not</li> </ul>

	availability. <ul style="list-style-type: none"> <li>Is any related repair information available?</li> </ul>		repaired, go to the next step.
		No	Go to the next step.
3	<b>INSPECT INSTRUMENT CLUSTER</b> <ul style="list-style-type: none"> <li>Perform the "INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE".  (See <b>INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE</b>.)</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the malfunctioning part, then go to Step 5.
		No	Go to the next step.
4	<b>INSPECT FUEL GAUGE SENDER UNIT</b> <ul style="list-style-type: none"> <li>Inspect the fuel gauge sender unit.  (See <b>INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE</b>.)</li> <li>Is there any malfunction?</li> </ul>	Yes	Replace the fuel gauge sender unit, then go to the next step.  (See <b>FUEL PUMP UNIT DISASSEMBLY/ASSEMBLY [LF]</b> .)
		No	Replace the PCM, then go to the next step.  (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)
5	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the "AFTER REPAIR PROCEDURE".  (See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</li> <li>Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection.  (See <b>DTC TABLE [LF]</b> .)
		No	DTC troubleshooting completed.

## 2008 - MX-5 - Engine

### DTC P0462 [LF]

DTC P0462	Fuel gauge sender unit circuit low input
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors the fuel level signal and fuel gauge sender unit output voltage from the instrument cluster. If the PCM detects a fuel level or fuel gauge sender unit output voltage is too low, the PCM determines that the fuel gauge sender unit circuit has a malfunction.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Fuel gauge sender unit malfunction</li> <li>Instrument cluster malfunction</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	YesGo to the next step.
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	NoRecord the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b>	YesPerform repair or diagnosis according to the available repair information.
	<ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information</li> </ul>	<ul style="list-style-type: none"> <li>If the vehicle is not</li> </ul>



	<p>availability.</p> <ul style="list-style-type: none"> <li>Is any related repair information available?</li> </ul>		<p>repaired, go to the next step.</p>
		No	Go to the next step.
3	<p><b>INSPECT INSTRUMENT CLUSTER</b></p> <ul style="list-style-type: none"> <li>Perform the "INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE".</li> </ul> <p>(See <a href="#">INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE</a>.)</p> <ul style="list-style-type: none"> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the malfunctioning part, then go to Step 5.
		No	Go to the next step.
4	<p><b>INSPECT FUEL GAUGE SENDER UNIT</b></p> <ul style="list-style-type: none"> <li>Inspect the fuel gauge sender unit.</li> </ul> <p>(See <a href="#">INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE</a>.)</p> <ul style="list-style-type: none"> <li>Is there any malfunction?</li> </ul>	Yes	<p>Replace the fuel gauge sender unit, then go to the next step.</p> <p>(See <a href="#">FUEL PUMP UNIT DISASSEMBLY/ASSEMBLY [LF]</a>.)</p>
		No	Go to the next step.
5	<p><b>VERIFY TROUBLESHOOTING OF DTC P0462 COMPLETED</b></p> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Start the engine.</li> <li>Drive the vehicle under the FREEZE FRAME DATA condition.</li> <li>Is the PENDING CODE for this DTC present?</li> </ul>	Yes	<p>Replace the PCM, then go to the next step.</p> <p>(See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a>.)</p>
		No	Go to the next step.
6	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"> <li>Perform the "AFTER REPAIR PROCEDURE".</li> </ul> <p>(See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</p> <ul style="list-style-type: none"> <li>Are any DTCs present?</li> </ul>	Yes	<p>Go to the applicable DTC inspection.</p> <p>(See <a href="#">DTC TABLE [LF]</a>.)</p>
		No	DTC troubleshooting completed.

## 2008 - MX-5 - Engine

### DTC P0463 [LF]

DTC P0463	Fuel gauge sender unit circuit high input
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors the fuel level signal and fuel gauge sender unit output voltage from the instrument cluster. If the PCM detects a fuel level or fuel gauge sender unit output voltage is too high, the PCM determines that the fuel gauge sender unit circuit has a malfunction.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Fuel gauge sender unit malfunction</li> <li>Instrument cluster malfunction</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b>	Yes Perform repair or diagnosis according to the available repair information.
	<ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information</li> </ul>	<ul style="list-style-type: none"> <li>If the vehicle is not</li> </ul>

	<p>availability.</p> <ul style="list-style-type: none"> <li>Is any related repair information available?</li> </ul>		<p>repaired, go to the next step.</p>
		No	Go to the next step.
3	<p><b>INSPECT INSTRUMENT CLUSTER</b></p> <ul style="list-style-type: none"> <li>Perform the "INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE".</li> </ul> <p>(See <b>INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE</b>.)</p> <ul style="list-style-type: none"> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the malfunctioning part, then go to Step 5.
		No	Go to the next step.
4	<p><b>INSPECT FUEL GAUGE SENDER UNIT</b></p> <ul style="list-style-type: none"> <li>Inspect the fuel gauge sender unit.</li> </ul> <p>(See <b>INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE</b>.)</p> <ul style="list-style-type: none"> <li>Is there any malfunction?</li> </ul>	Yes	<p>Replace the fuel gauge sender unit, then go to the next step.</p> <p>(See <b>FUEL PUMP UNIT DISASSEMBLY/ASSEMBLY [LF]</b>.)</p>
		No	Go to the next step.
5	<p><b>VERIFY TROUBLESHOOTING OF DTC P0463 COMPLETED</b></p> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Drive the vehicle under the FREEZE FRAME DATA condition.</li> <li>Is the PENDING CODE for this DTC present?</li> </ul>	Yes	<p>Replace the PCM, then go to the next step.</p> <p>(See <b>PCM REMOVAL/INSTALLATION [LF]</b>.)</p>
		No	Go to the next step.
6	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"> <li>Perform the "AFTER REPAIR PROCEDURE".</li> </ul> <p>(See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</p> <ul style="list-style-type: none"> <li>Are any DTCs present?</li> </ul>	Yes	<p>Go to the applicable DTC inspection.</p> <p>(See <b>DTC TABLE [LF]</b>.)</p>
		No	DTC troubleshooting completed.

2008 - MX-5 - Engine

DTC P0500 [LF]

DTC P0500	VSS circuit problem
DETECTION CONDITION	<div><p><b>With ABS/DSC</b></p><ul style="list-style-type: none"><li>• If an error in the wheel speed signal from the ABS/DSC HU/CM is detected by CAN when the following conditions are met:<ul style="list-style-type: none"><li>▪ Neutral switch and clutch pedal position switch are OFF</li><li>▪ Load is <b>above 40 %</b></li><li>▪ Engine speed is <b>2,000 rpm or above</b></li><li>▪ Brake switch is OFF</li><li>▪ Shift lever position (P, N, R position) (AT)</li></ul></li></ul></div> <div><p><b>MT without ABS/DSC</b></p><ul style="list-style-type: none"><li>• Vehicle speed signal from vehicle speed sensor is <b>below 3.7 km/h {2.3 mph}</b> when the following conditions are met:<ul style="list-style-type: none"><li>▪ Neutral switch and clutch pedal position switch are OFF</li><li>▪ Load is above <b>40 %</b></li><li>▪ Engine speed is <b>2,000 rpm or above</b></li><li>▪ Brake switch is OFF</li></ul></li></ul></div> <div><p><b>Diagnostic support note</b></p><ul style="list-style-type: none"><li>• This is a continuous monitor (CCM).</li><li>• The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul></div>
	<p><b>With ABS/DSC</b></p>

Front ABS wheel-speed sensor malfunction

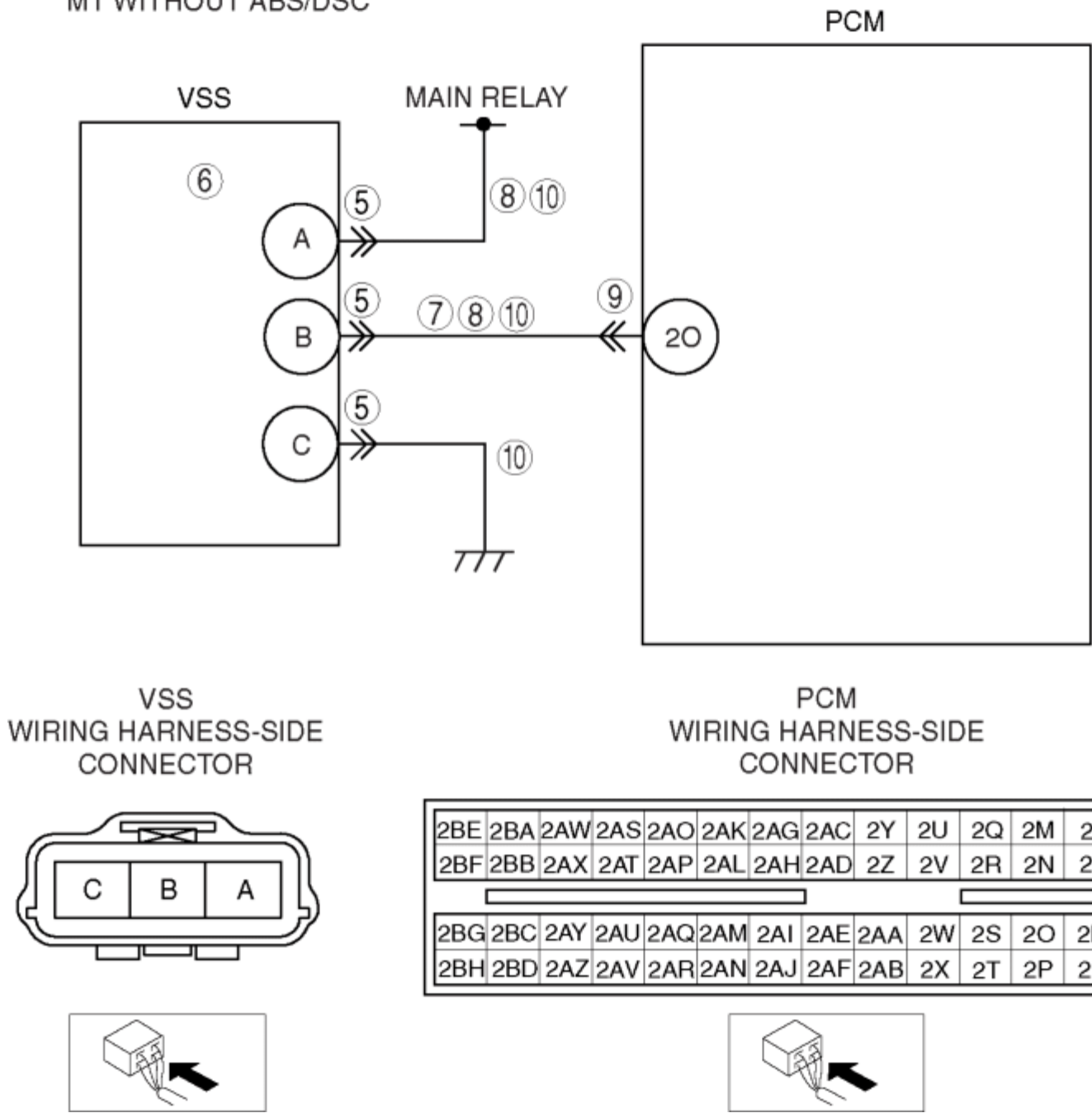
- ABS/DSC HU/CM malfunction
- Connector or terminal malfunction
- PCM malfunction

**MT without ABS/DSC**

- VSS malfunction
- Connector or terminal malfunction
- Open circuit in wiring harness between PCM terminal 2O and VSS terminal B
- Open circuit in wiring harness between main relay and VSS terminal A
- Open circuit in wiring harness between VSS terminal C and body ground
- Shot to ground in wiring harness between main relay and VSS terminal A
- Short to ground in wiring harness between PCM terminal 2O and VSS terminal B
- Short to power supply in wiring harness between PCM terminal 2O and VSS terminal B
- PCM malfunction

**POSSIBLE  
CAUSE**

MT WITHOUT ABS/DSC



Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"><li>Has FREEZE FRAME DATA been recorded?</li></ul>	YesGo to the next step.
		NoRecord the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"><li>Verify related Service Bulletins and/or on-</li></ul>	YesPerform repair or diagnosis according to the available repair information.

	<p>line repair information availability.</p> <ul style="list-style-type: none"> <li>Is any related repair information available?</li> </ul>		<p>If the vehicle is not repaired, go to the next step.</p>
		No	Go to the next step.
3	<p><b>VERIFY STORED DTC IN ABS HU/CM OR DSC HU/CM (With ABS/DSC)</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Verify stored DTCs in ABS HU/ CM or DSC HU/CM.</li> <li>Are DTCs stored?</li> </ul>	Yes	<p>Go to the appropriate DTC inspection (See <a href="#">INTERMITTENT CONCERN TROUBLESHOOTING [LF]</a>.)</p>
		No	Go to the Step 11.
4	<p><b>VERIFY CURRENT INPUT SIGNAL STATUS-IS CONCERN INTERMITTENT OR CONSTANT (MT WITHOUT ABS/DSC)</b></p> <ul style="list-style-type: none"> <li>Connect the M-MDS to DLC-2.</li> <li>Start the engine.</li> <li>Access VSS PID using the M-MDS. <ul style="list-style-type: none"> <li>Vehicle speed <b>20 km/h {12.4 mph}</b>: 20km/h {12.4 mph}</li> <li>Vehicle speed <b>40 km/h {24.8 mph}</b>: 40km/h {24.8 mph}</li> </ul> </li> <li>Are PID readings within specification?</li> </ul>	Yes	<p>Go to the INTERMITTENT concern troubleshooting procedure. (See <a href="#">INTERMITTENT CONCERN TROUBLESHOOTING [LF]</a>.)</p>
		No	Go to the next step.
5	<p><b>INSPECT VSS CONNECTOR FOR POOR CONNECTION</b></p> <ul style="list-style-type: none"> <li>Verify that the VSS connector is connected securely.</li> <li>Is connector normal?</li> </ul>	Yes	Go to the next step.
		No	Reconnect the connector, then go to Step 11.
6	<p><b>INSPECT THE VSS</b></p> <ul style="list-style-type: none"> <li>Perform VSS inspection. (See <a href="#">VEHICLE SPEED SENSOR (VSS) INSPECTION [P66M-D]</a>.)</li> <li>Is the VSS normal?</li> </ul>	Yes	Go to the next step.
		No	<p>Replace VSS, then go to Step 11. (See <a href="#">VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION [P66M-D]</a>.)</p>
7	<p><b>INSPECT VSS CIRCUIT FOR SHORT TO POWER SUPPLY</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the VSS connector.</li> <li>Turn the ignition switch to the ON</li> </ul>	Yes	Repair or replace suspected harness, then go to Step 11.
		No	Go to the next step.

	<p>position (Engine off).</p> <ul style="list-style-type: none"><li>• Measure the voltage following terminals:<ul style="list-style-type: none"><li>▪ VSS terminal A (wiring harness-side)</li><li>▪ VSS terminal B (wiring harness-side)</li></ul></li><li>• Is any voltage reading?</li></ul>		
8	<b>INSPECT VSS CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"><li>• inspect for continuity between following terminal and body ground:<ul style="list-style-type: none"><li>▪ VSS terminal B (wiring harness-side)</li></ul></li><li>• Is there continuity?</li></ul>	Yes	Repair or replace suspected harness, then go to Step 11.
		No	Go to the next step.
9	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"><li>• Disconnect the PCM connector.</li><li>• Inspect for poor connection (such as damaged/ pulled-out terminals, corrosion).</li><li>• Is there any malfunction?</li></ul>	Yes	Repair terminal, then go to Step 11.
		No	Go to the next step.
10	<b>INSPECT VSS CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"><li>• inspect for continuity between following terminals (wiring harness-side):<ul style="list-style-type: none"><li>▪ VSS terminal A and main relay</li><li>▪ VSS terminal B and PCM terminal 2O</li><li>▪ VSS terminal C and body ground</li></ul></li><li>• Is there continuity?</li></ul>	Yes	Inspect VSS pulse wheel for damage. Replace VSS pulse wheel and go to the next step.
		No	Repair or replace suspected harness, then go to the next step.
11	<b>VERIFY TROUBLESHOOTING OF DTC P0500 COMPLETED</b> <ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Turn the ignition switch to the ON position (Engine off).</li><li>• Clear the DTC from PCM memory using the M-MDS.</li><li>• Warm up the engine.</li></ul>	Yes	Replace PCM, then go to the next step.  (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.



	<ul style="list-style-type: none"><li>• Access RPM and LOAD PID using the M-MDS.</li><li>• Drive vehicle under the following conditions for <b>18 s</b>.<ul style="list-style-type: none"><li>▪ Engine speed: <b>2,000 rpm or above</b></li><li>▪ Gear: Gear is in other than NEUTRAL</li><li>▪ Load: <b>40 % or above</b></li></ul></li><li>• Is PENDING CODE for this DTC present?</li></ul>		
12	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "AFTER REPAIR PROCEDURE".  (See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</li><li>• Are any DTCs present?</li></ul>	Yes	Go to applicable DTC troubleshooting. (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.

## 2008 - MX-5 - Engine

### DTC P0505 [LF]

DTC P0505	Idle speed control system problem
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM cannot control idle speed toward target idle speed while KOER self test.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Drive-by-wire control system malfunction</li> <li>Air cleaner element clogged</li> <li>Air intake passage clogged</li> <li>A/C relay control circuit malfunction</li> <li>Generator control circuit malfunction</li> <li>Low engine compression (Over capacity of blow-by gas)</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b>	
	<ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	<p>Yes Perform repair or diagnosis according to the available repair information.</p> <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> <p>No Go to the next step.</p>
2	<b>VERIFY RELATED PENDING OR STORED DTC</b>	
	<ul style="list-style-type: none"> <li>Turn the ignition switch off then to the ON position. (Engine off)</li> <li>Verify pending code or stored DTCs using the M-MDS.</li> <li>Does DTC P0506, P0507,</li> </ul>	<p>Yes Perform the applicable DTC troubleshooting. (See <a href="#">DTC TABLE [LF]</a>.)</p> <p>No Go to the next step.</p>

	P0638, P2101, P2107, P2108, P2109, P2112 or P2119 presents?		
3	<b>INSPECT ELECTRONIC THROTTLE CONTROL SYSTEM OPERATION</b> <ul style="list-style-type: none"> <li>Perform Electronic Throttle control system inspection.</li> <li>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF].</b>)</li> <li>Does Electronic Throttle control system work properly?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace malfunctioning part, according to inspection results.  Then go to Step 9.
4	<b>INSPECT A/C MAGNETIC CLUTCH OPERATION</b>  <b>NOTE:</b> <ul style="list-style-type: none"> <li>The following test should be performed for the A/C. Go to the next step for vehicles without A/C</li> <li>Turn the fan switch off.</li> <li>Is the magnetic clutch still on?</li> </ul>	Yes	Go to "A/C ALWAYS ON / A/C COMPRESSOR RUNS CONTINUOUSLY." of ENGINE SYMPTOM TROUBLESHOOTING then go to Step 9.  (See <b>SYMPTOM DIAGNOSTIC INDEX [LF].</b> )
		No	Go to the next step.
5	<b>INSPECT GENERATOR CONTROL CIRCUIT MALFUNCTION</b> <ul style="list-style-type: none"> <li>Apply electrical load.</li> <li>Is the engine speed increased?</li> </ul>	Yes	Go to the next step.
		No	Repair short to power supply in generator control circuit, then go to Step 9.
6	<b>INSPECT AIR CLEANER ELEMENT</b> <ul style="list-style-type: none"> <li>Remove air cleaner element with the engine running.</li> <li>Is the engine speed increased?</li> </ul>	Yes	Clean or replace the air cleaner element, then go to Step 9.  (See <b>INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [LF].</b> )
		No	Go to the next step.
7	<b>INSPECT THROTTLE BODY PASSAGE</b> <ul style="list-style-type: none"> <li>Is the throttle body clogged?</li> </ul>	Yes	Clean or replace the throttle body passage, then go to Step 9.
		No	Go to the next step.
8	<b>INSPECT ENGINE COMPRESSION</b> <ul style="list-style-type: none"> <li>Inspect engine compression.</li> </ul>	Yes	Go to the next step.

	<p>(See <b>COMPRESSION INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"><li>Is engine compression normal?</li></ul>	No	Overhaul the engine, then go to the next step.
9	<p><b>VERIFY TROUBLESHOOTING OF DTC P0505 COMPLETED</b></p> <ul style="list-style-type: none"><li>Make sure to reconnect all disconnected connectors.</li><li>Clear the DTC using the M-MDS.</li><li>Perform the KOER self-test.</li></ul> <p>(See <b>KOEO/KOER SELF TEST [LF]</b>.)</p> <ul style="list-style-type: none"><li>Is the same DTC present?</li></ul>	Yes	Replace the PCM, then go to the next step.  (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)
		No	Go to the next step.
10	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"><li>Perform the "AFTER REPAIR PROCEDURE".</li></ul> <p>(See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</p> <ul style="list-style-type: none"><li>Are any DTC present?</li></ul>	Yes	Go to the applicable DTC troubleshooting.  (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.

2008 - MX-5 - Engine

DTC P0506 [LF]

DTC P0506	Idle speed control system RPM lower than expected
DETECTION CONDITION	<div><ul style="list-style-type: none"><li>Actual idle speed is lower than expected by <b>100 rpm</b> for <b>14 s</b>, when brake pedal is depressed (brake switch is on) and steering wheel is held straight ahead (power steering pressure (PSP) switch is off).</li></ul></div> <div>NOTE:</div> <div><ul style="list-style-type: none"><li>If atmospheric pressure is less than <b>72.3 kPa {542 mmHg, 21.3inHg}</b> or intake air temperature is <b>below –10 °C {14 °F}</b>, the PCM cancels diagnosis of P0506.</li></ul></div> <div>Diagnostic support note</div> <div><ul style="list-style-type: none"><li>This is a continuous monitor (CCM).</li><li>The MIL illuminates if the PCM detects the above malfunction conditions in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul></div>
POSSIBLE CAUSE	<div><ul style="list-style-type: none"><li>Electronic throttle control system malfunction</li><li>Air cleaner element clogged</li><li>Air intake passage clogged</li><li>A/C relay control circuit malfunction</li><li>Generator malfunction</li><li>Purge solenoid valve malfunction</li><li>Low engine compression (Over capacity of blow-by gas)</li><li>PCM malfunction</li></ul></div>

Diagnostic procedure

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STEP	INSPECTION	ACTION	
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<b>VERIFY RELATED PENDING OR STORED DTCs</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off, then to the ON position (Engine off).</li> <li>Verify PENDING CODE or stored DTCs using the M-MDS.</li> <li>Are other DTCs present?</li> </ul>	Yes	Repair the applicable DTCs. (See <b>DTC TABLE [LF]</b> .)
		No	Go to the next step.
4	<b>INSPECT A/C MAGNET CLUTCH OPERATION</b> <ul style="list-style-type: none"> <li>Turn the fan switch off.</li> <li>Is the magnet clutch still on?</li> </ul>	Yes	Refer to "A/C is always on or A/C compressor runs continuously." of ENGINE SYMPTOM TROUBLESHOOTING, then go to Step 9. (See <b>NO.24 A/C IS ALWAYS ON/A/C COMPRESSOR RUNS CONTINUOUSLY [LF]</b> .)
		No	Go to the next step.
5	<b>INSPECT PURGE SOLENOID VALVE MALFUNCTION</b> <ul style="list-style-type: none"> <li>Inspect the purge solenoid valve.                (See <b>PURGE SOLENOID VALVE INSPECTION [LF]</b>.)</li> <li>Is purge solenoid valve normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the purge solenoid valve, then go to Step 9. (See <b>PURGE SOLENOID VALVE REMOVAL/INSTALLATION [LF]</b> .)
6	<b>INSPECT AIR CLEANER ELEMENT</b> <ul style="list-style-type: none"> <li>Remove the air cleaner element with the engine running.</li> </ul>	Yes	Replace the air cleaner element, then go to Step 9. (See <b>INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [LF]</b> .)

	<ul style="list-style-type: none"> <li>Is the engine speed increased?</li> </ul>	No	Go to the next step.
7	<b>INSPECT ENGINE COMPRESSION</b> <ul style="list-style-type: none"> <li>Inspect the engine compression. (See <b>COMPRESSION INSPECTION [LF]</b>.)</li> <li>Is the engine compression normal?</li> </ul>	Yes	Go to the next step.
		No	Overhaul the engine, then go to Step 9.
8	<b>INSPECT GENERATOR</b> <ul style="list-style-type: none"> <li>Inspect the generator. (See <b>GENERATOR INSPECTION [LF]</b>.)</li> <li>Is the generator normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the related part, then go to the next step.
9	<b>VERIFY TROUBLESHOOTING OF DTC P0506 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Start the engine.</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Depress the brake pedal for <b>14 s or more</b>.</li> <li>Is the PENDING CODE for this DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step. (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)
		No	Go to the next step.
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "AFTER REPAIR PROCEDURE". (See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.

## 2008 - MX-5 - Engine

### DTC P0507 [LF]

DTC P0507	Idle speed control system RPM higher than expected
DETECTION CONDITION	<ul style="list-style-type: none"> <li>Actual idle speed is higher than expected by <b>200 rpm</b> for <b>14 s</b>, when the brake pedal is depressed (brake switch is on) and steering wheel is held straight ahead (power steering pressure (PSP) switch is off).</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>If atmospheric pressure is less than <b>72.3 kPa {542 mmHg, 21.3inHg}</b> or intake air temperature is <b>below -10 °C {14 °F}</b>, the PCM cancels diagnosis of P0507.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>The MIL illuminates if the PCM detects the above malfunction conditions in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>Electronic throttle control system malfunction</li> <li>Vacuum hose misconnection</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.

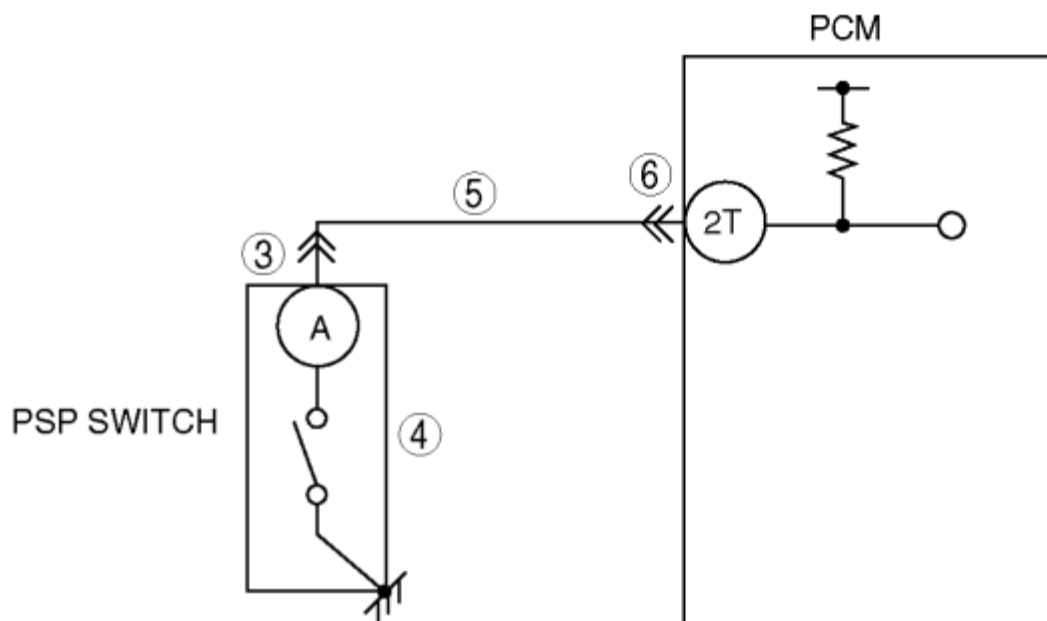


2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>• Verify related Service Bulletins and/or on-line repair information availability.</li> <li>• Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>• If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<b>VERIFY RELATED PENDING OR STORED DTCs</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off, then to the ON position (Engine off).</li> <li>• Verify PENDING CODE or stored DTCs using the M-MDS.</li> <li>• Are other DTCs present?</li> </ul>	Yes	Repair the applicable DTCs. (See <a href="#">DTC TABLE [LF]</a> .)
		No	Go to the next step.
4	<b>INSPECT VACUUM HOSE CONNECTION</b> <ul style="list-style-type: none"> <li>• Are vacuum hoses connecting accurately?</li> </ul>	Yes	Go to the next step.
		No	Reconnect vacuum hose accurately, then go to the next step.
5	<b>VERIFY TROUBLESHOOTING OF DTC P0507 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Start the engine.</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Depress the brake pedal for <b>14 seconds or more</b>.</li> <li>• Is the PENDING CODE for this DTC present?</li> </ul>	Yes	Replace this PCM, then go to the next step. (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
6	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform "AFTER REPAIR PROCEDURE".  (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</li> <li>• Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .)
		No	Troubleshooting completed.

2008 - MX-5 - Engine

DTC P0550 [LF]

DTC P0550	PSP switch circuit malfunction
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors PSP switch signal at PCM terminal 2T. If input voltage is low voltage (switch stays on) for <b>1 min</b> when the VSS is <b>above 60.0 km/h {37.4 mph}</b> and ECT is <b>above 60 °C {140 °F}</b>, the PCM determines that PSP switch circuit has malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (CCM).</li><li>• The MIL illuminates if the PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• PSP switch malfunction</li><li>• Connector or terminal malfunction</li><li>• Short to ground in wiring harness between PSP switch terminal A and PCM terminal 2T</li><li>• PCM malfunction</li></ul>

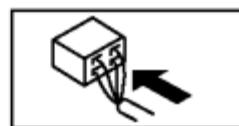
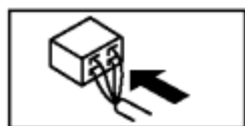


PSP SWITCH  
HARNESS SIDE CONNECTOR

PCM  
WIRING HARNESS-SIDE CONNECTOR



2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.

3	<b>INSPECT PSP SWITCH CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect PSP connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 7.
		No	Go to the next step.
4	<b>INSPECT PSP SWITCH</b> <ul style="list-style-type: none"> <li>• Perform PSP switch inspection.</li> <li>(See <b>POWER STEERING PRESSURE (PSP) SWITCH INSPECTION [LF]</b>.)</li> <li>• Is PSP switch normal?</li> </ul>	Yes	Go to the next step.
		No	Replace PSP switch, then go to Step 7.
5	<b>INSPECT PSP SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Disconnect PCM connector.</li> <li>• Inspect continuity between PSP switch terminal (harness-side) A and body ground.</li> <li>• Is there continuity?</li> </ul>	Yes	Repair or replace harness for short to ground, then go to Step 7.
		No	Go to the next step.
6	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn ignition switch to OFF</li> <li>• Disconnect PCM connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair terminal, then go to Step 7.
		No	Go to the next step.
7	<b>VERIFY TROUBLESHOOTING OF DTC P0550 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Start engine.</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Drive vehicle <b>above 60 km/h {37.3 mph}</b> for <b>1 min.</b></li> <li>• Verify that ECT PID <b>above 60 °C {140 °F}</b> using the M-MDS.</li> <li>• Is PENDING CODE for this DTC</li> </ul>	Yes	Replace PCM, then go to the next step. (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)
		No	Go to the next step.

	present?		
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>Perform the "AFTER REPAIR PROCEDURE".</li></ul> (See <b>AFTER REPAIR PROCEDURE [LF]</b> .) <ul style="list-style-type: none"><li>Is any DTC present?</li></ul>	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.

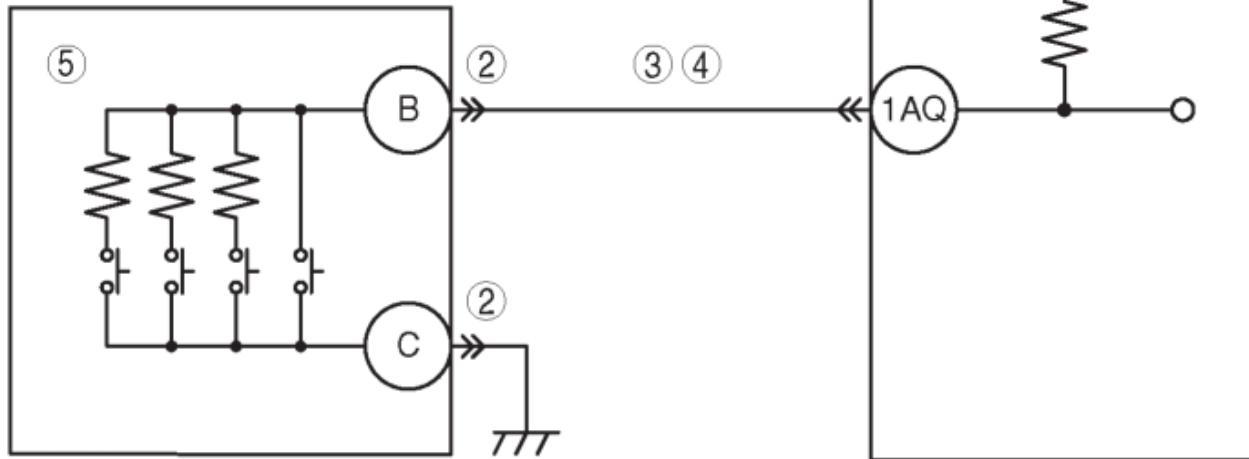
2008 - MX-5 - Engine

DTC P0564 [LF]

DTC P0564	Cruise control switch circuit malfunction
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors the cruise control switch signal at PCM terminal 1AQ. If the PCM detects that any one of following switches (ON OFF, SET/-, SET/COAST, RES/+) remains on for <b>2 min</b>, the PCM determines that the cruise control switch circuit has a malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (Other).</li><li>• The MIL does not comes on.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Cruise control switch malfunction</li><li>• Connector or terminal malfunction</li><li>• Short to power circuit in wiring from cruise control switch terminal B and PCM terminal 1AQ</li><li>• Short to ground circuit in wiring from cruise control switch terminal B and PCM terminal 1AQ</li><li>• PCM malfunction</li></ul>

PCM

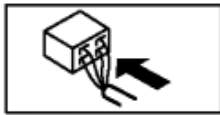
CRUISE CONTROL SWITCH



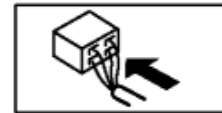
PCM

WIRING HARNESS-SIDE CONNECTOR

CRUISE CONTROL SWITCH  
WIRING HARNESS-SIDE CONNECTOR



1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	<p>Yes Perform repair or diagnosis according to the available repair information.</p> <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> <p>No Go to the next step.</p>
2	<b>INSPECT CRUISE CONTROL SWITCH CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Inspect for poor connection (such as damaged, pulled-out terminals, corrosion).</li> <li>Is there any malfunction?</li> </ul>	<p>Yes Repair or replace the terminal, then go to Step 6.</p> <p>No Go to the next step.</p>
	<b>INSPECT CRUISE CONTROL SWITCH SIGNAL CIRCUIT FOR</b>	

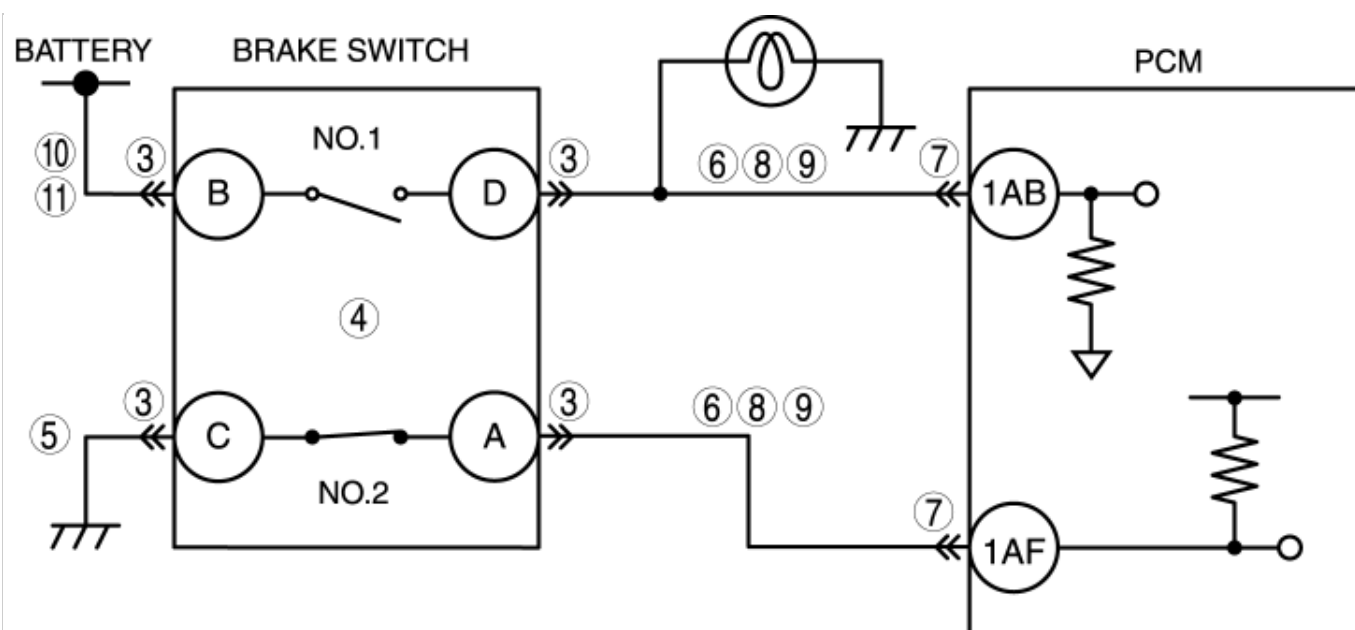
3	<b>SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Disconnect cruise control switch and PCM connectors.</li> <li>• Inspect for continuity between cruise control switch terminal B (wiring harness-side) and body ground.</li> <li>• Is there continuity?</li> </ul>	Yes	Repair or replace short to ground, then go to Step 6.
		No	Go to the next step.
4	<b>INSPECT CRUISE CONTROL SWITCH SIGNAL CIRCUIT FOR SHORT TO POWER</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position (Engine off).</li> <li>• Inspect the voltage between cruise control switch terminal B (wiring harness-side) and body ground.</li> <li>• Is the voltage <b>below 1.0 V</b>?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace short to power supply, then go to Step 6.
5	<b>INSPECT CRUISE CONTROL SWITCH OPERATION</b> <ul style="list-style-type: none"> <li>• Inspect the cruise control switch. (See <a href="#">CRUISE CONTROL SWITCH INSPECTION [LF]</a>.)</li> <li>• Is the cruise control switch normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the cruise control switch, then go to the next step.
6	<b>VERIFY TROUBLESHOOTING OF DTC P0564 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Drive the vehicle with cruise control <b>2 min. or more</b>.</li> <li>• Is the same DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step.  (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
7	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform "AFTER REPAIR PROCEDURE". (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</li> <li>• Is there any DTC present?</li> </ul>	Yes	Go to the applicable DTC inspection.  (See <a href="#">DTC TABLE [LF]</a> .)
		No	Troubleshooting completed.



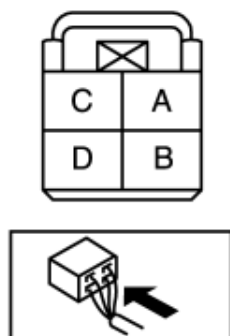
## 2008 - MX-5 - Engine

### DTC P0571 [LF]

DTC P0571	Brake switch circuit problem
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors switching in conjunction with brake switches No.1 and No.2. If either No.1 or No.2 do not switch for a continuous five times even though either No.1 or No.2 is switched from off to on or from on to off, P0571 is detected.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (Other).</li><li>• The MIL does not comes on.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Brake switch malfunction</li><li>• Connector or terminal malfunction</li><li>• Open circuit in wiring harness between brake switch terminal A and PCM terminal 1AF</li><li>• Open circuit in wiring harness between brake switch terminal C and body ground</li><li>• Open circuit in wiring harness between battery positive terminal and brake switch terminal B</li><li>• Open circuit in wiring harness between brake switch terminal D and PCM terminal 1AB</li><li>• Short to ground in wiring harness between brake switch terminal D and PCM terminal 1AB</li><li>• Short to power supply in wiring harness between brake switch terminal D and PCM terminal 1AB</li><li>• Short to ground in wiring harness between brake switch terminal A and PCM terminal 1AF</li><li>• PCM malfunction</li></ul>

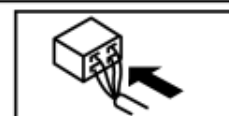


BRAKE SWITCH  
WIRING HARNESS-SIDE CONNECTOR



PCM  
WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.  No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> No Go to the next step.
3	<b>INSPECT BRAKE SWITCH CONNECTOR FOR POOR CONNECTION</b>	Yes Repair or replace the terminal, then go to

	<ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the brake switch connector.</li> <li>• Inspect for poor connection (such as damaged, pull-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Step 12.
		No Go to the next step.
4	<b>INSPECT BRAKE SWITCH</b> <ul style="list-style-type: none"> <li>• Inspect the brake switch.</li> <li>• Is the brake switch normal?</li> </ul>	Yes Go to the next step. No Replace brake switch, then go to Step 12. (See <b>BRAKE PEDAL REMOVAL/INSTALLATION.</b> )
5	<b>INSPECT GROUND CIRCUIT OF BRAKE SWITCH NO.2 FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between brake switch terminal C (wiring harness-side) and body ground.</li> <li>• Is there continuity?</li> </ul>	Yes Go to the next step. No Repair or replace the wiring harness for open circuit, then go to Step 12.
6	<b>INSPECT SIGNAL CIRCUIT OF BRAKE SWITCH NO.1 AND NO.2 FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between the following terminal: <ul style="list-style-type: none"> <li>▪ Brake switch terminal A (wiring harness-side) and body ground.</li> <li>▪ Brake switch terminal D (wiring harness-side) and body ground.</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes Repair or replace the wiring harness for short to ground circuit, then go to Step 12. No Go to the next step.
7	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect PCM connector.</li> <li>• Inspect for poor connection (such as damaged, pull-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes Repair or replace the terminal, then go to Step 12. No Go to the next step.
8	<b>INSPECT SIGNAL CIRCUIT OF BRAKE SWITCH NO.1 AND NO.2 FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between the following terminal: <ul style="list-style-type: none"> <li>▪ Brake switch terminal A (wiring harness-side) and PCM terminal 1AF (wiring harness-side)</li> </ul> </li> </ul>	Yes Go to the next step. No Repair or replace the wiring harness for open circuit, then go to Step 12.

	<p>Brake switch terminal D (wiring harness-side) and PCM terminal 1AB (wiring harness-side)</p> <ul style="list-style-type: none"> <li>Is there continuity?</li> </ul>		
9	<p><b>INSPECT SIGNAL CIRCUIT OF BRAKE SWITCH NO.2 FOR SHORT TO POWER SUPPLY</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Measure the voltage between brake switch terminal A (wiring harness-side) and body ground.</li> <li>Is the voltage <b>B+</b>?</li> </ul>	<p>Yes Repair or replace the wiring harness for short to power circuit, then go to Step 12.</p> <p>No Go to the next step.</p>	
10	<p><b>INSPECT POWER CIRCUIT OF BRAKE SWITCH NO.1 FOR OPEN CIRCUIT</b></p> <ul style="list-style-type: none"> <li>Measure the voltage between brake switch terminal B (wiring harness-side) and body ground.</li> <li>Is the voltage <b>B+</b>?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Repair or replace the wiring harness for a possible open circuit, then go to step 12.</p>	
11	<p><b>INSPECT POWER CIRCUIT OF BRAKE SWITCH NO.1 FOR SHORT CIRCUIT TO GROUND</b></p> <ul style="list-style-type: none"> <li>Inspect for continuity between the following terminal: <ul style="list-style-type: none"> <li>Brake switch terminal B (wiring harness-side) and body ground.</li> </ul> </li> <li>Is there continuity?</li> </ul>	<p>Yes Repair or replace the wiring harness for a possible short to ground, then go to the next step.</p> <p>No Go to the next step.</p>	
12	<p><b>VERIFY TROUBLESHOOTING OF DTC P0571 COMPLETED</b></p> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Depress and release the brake pedal <b>more than 5 times</b>.</li> <li>Is the same DTC present?</li> </ul>	<p>Yes Replace the PCM, then go to the next step. (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a>.)</p> <p>No Go to the next step.</p>	
13	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"> <li>Perform "AFTER REPAIR PROCEDURE". (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</li> <li>Is any DTC present?</li> </ul>	<p>Yes Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [LF]</a>.)</p> <p>No Troubleshooting completed.</p>	



## 2008 - MX-5 - Engine

### DTC P0601 [LF]

DTC P0601	PCM memory check sum error
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM internal memory check sum error</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>PCM internal memory malfunction</li> <li>PCM internal CPU malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b>	Yes Perform repair or diagnosis according to the available repair information.
	<ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	<ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
	<b>VERIFY TROUBLESHOOTING OF DTC P0601</b>	No Go to the next step.

3	<b>COMPLETED</b> <ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Clear the DTC from the PCM memory using the M-MDS.</li><li>• Start the engine.</li><li>• Is the same DTC present?</li></ul>	Yes	Replace the PCM, then go to the next step.  (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
4	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "AFTER REPAIR PROCEDURE".  (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</li><li>• Is any DTC present?</li></ul>	Yes	Go to the applicable DTC inspection.  (See <a href="#">DTC TABLE [LF]</a> .)
		No	DTC troubleshooting completed.

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### DTC P0602 [LF]

DTC P0602	PCM programming error
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>No configuration data in the PCM</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>If the "PCM CONFIGURATION" is successful, the PCM stores DTC P0602 and illuminates the MIL (system is normal). Clear DTC P0602 using the M-MDS after the "PCM CONFIGURATION".</li> <li>The MIL goes out after three drive cycles with no failure (DTCs remain in PCM).</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Configuration has not been completed</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION		ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION</b>	Yes	Perform repair or diagnosis according



	<b>AVAILABILITY</b> <ul style="list-style-type: none"> <li>• Verify related Service Bulletins and/or on-line repair information availability.</li> <li>• Is any related repair information available?</li> </ul>		to the available repair information.
		No	Go to the next step.
3	<b>VERIFY TROUBLESHOOTING OF DTC P0602 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Turn the ignition switch to the ON position (Engine off).</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Perform the HO2S heater, HO2S, and TWC Repair Verification Drive Mode. (See <b>OBD-II DRIVE MODE [LF]</b>.)</li> <li>• Is the same DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step.  (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)
		No	Go to the next step.
4	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform the "AFTER REPAIR PROCEDURE". (See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</li> <li>• Is any DTC present?</li> </ul>	Yes	Go to the applicable DTC troubleshooting.  (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.

## 2008 - MX-5 - Engine

### DTC P0604 [LF]

DTC P0604	PCM random access memory (RAM) error
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM internal RAM malfunction.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>PCM internal RAM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	YesGo to the next step.
		NoRecord the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	YesPerform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		NoGo to the next step.
3	<b>VERIFY TROUBLESHOOTING OF DTC P0604 COMPLETED</b>	YesReplace the PCM, then go to the next step.

	<ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Clear the DTC from the PCM memory using the M-MDS.</li><li>• Start the engine.</li><li>• Is the same DTC present?</li></ul>		(See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
4	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "AFTER REPAIR PROCEDURE".</li></ul> (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a> .)	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .)
		No	DTC troubleshooting completed.
	<ul style="list-style-type: none"><li>• Is any DTC present?</li></ul>		

## 2008 - MX-5 - Engine

### DTC P0606 [LF]

DTC P0606	PCM processor
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM internal CPU malfunction</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>PCM internal CPU malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>VERIFY TROUBLESHOOTING OF DTC P0606 COMPLETED</b>	Yes Replace the PCM, go to the next step.

	<ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Clear the DTC from the PCM memory using the M-MDS.</li><li>• Start the engine.</li><li>• Is the same DTC present?</li></ul>		(See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
4	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "AFTER REPAIR PROCEDURE".</li></ul> (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a> .)	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .)
	<ul style="list-style-type: none"><li>• Are any DTCs present?</li></ul>	No	Troubleshooting completed.

## 2008 - MX-5 - Engine

### DTC P0610 [LF]

DTC P0610	PCM vehicle options error
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM data configuration error</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Configuration procedure has not been completed</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b>	Yes Perform repair or diagnosis according to the available repair information.
	<ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	<ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
	<b>VERIFY TROUBLESHOOTING OF DTC P0610</b>	No Go to the next step.

3	<b>COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Turn the ignition switch to the ON position (Engine off).</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Start the engine.</li> <li>• Is the same DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step.  (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
4	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform the "AFTER REPAIR PROCEDURE".</li> </ul> (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a> .) <ul style="list-style-type: none"> <li>• Is any DTC present?</li> </ul>	Yes	Go to the applicable DTC troubleshooting.  (See <a href="#">DTC TABLE [LF]</a> .)
		No	Troubleshooting completed.

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### DTC P0638 [LF]

DTC P0638	Throttle actuator control circuit range/performance problem
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM compares the actual TP with the target TP when the engine is running. If the difference is more than the specification, the PCM determines that there is a throttle actuator control circuit range/performance problem.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Throttle actuator malfunction</li> <li>Throttle valve malfunction</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>

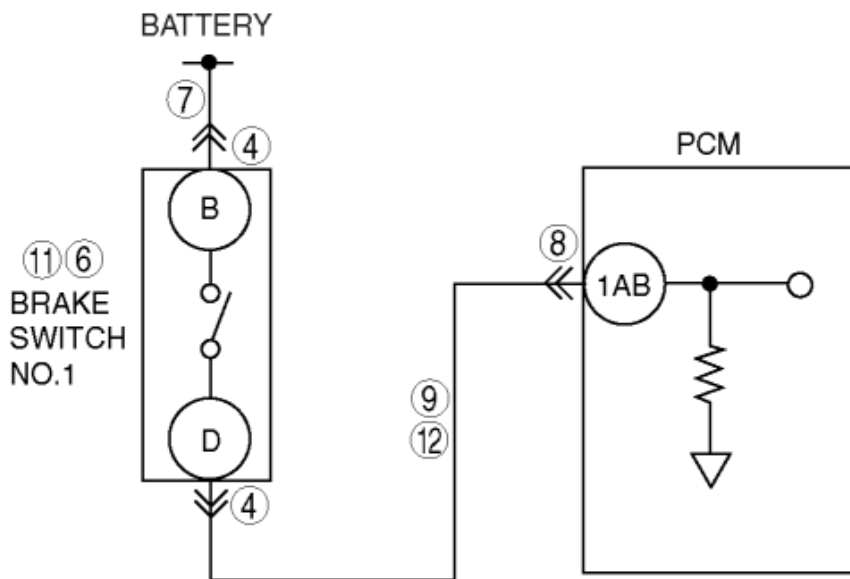


	Is any related repair information available?	No	Go to the next step.
3	<b>VERIFY RELATED PENDING CODE OR STORED DTC</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off, then to the ON position (Engine off).</li> <li>• Verify the related PENDING CODE or stored DTCs.</li> <li>• Are other DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .)
		No	Go to the next step.
4	<b>VERIFY TROUBLESHOOTING OF DTC P0638 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Start the engine.</li> <li>• Is the same DTC present?</li> </ul>	Yes	Replace the PCM, go to the next step. (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
5	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform the "AFTER REPAIR PROCEDURE". (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</li> <li>• Is any DTC present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .)
		No	DTC troubleshooting completed.

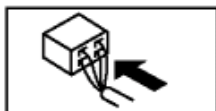
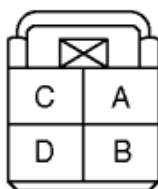
2008 - MX-5 - Engine

DTC P0703 [LF]

DTC P0703	Brake switch input circuit problem
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors changes in input voltage from the brake switch No.1. If the PCM does not the voltage changes while alternately accelerating and decelerating <b>8 times</b>, the PCM determines that the brake switch No.1 circuit has a malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (CCM).</li><li>• The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Brake switch malfunction</li><li>• Poor connection of brake switch connector or PCM connector</li><li>• Short to power supply in wiring harness between brake switch No.1 terminal D and PCM connector terminal 1AB</li><li>• Open circuit in wiring harness between brake switch No.1 terminal D and PCM connector terminal 1AB</li><li>• Open circuit in wiring harness between battery positive terminal and brake switch No.1 terminal B</li><li>• PCM malfunction</li></ul>

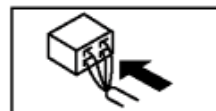


BRAKE SWITCH  
WIRING HARNESS-SIDE CONNECTOR



PCM  
WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step. No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> No Go to the next step.
3	<b>CLASSIFY HIGH INPUT OR LOW INPUT</b> <ul style="list-style-type: none"> <li>Connect the M-MDS to DLC 2.</li> <li>Access BOO PID.</li> <li>Verify BOO PID during brake pedal operation.</li> <li>Is BOO PID always OFF?</li> </ul>	Yes Go to the next step. No Go to Step 10.

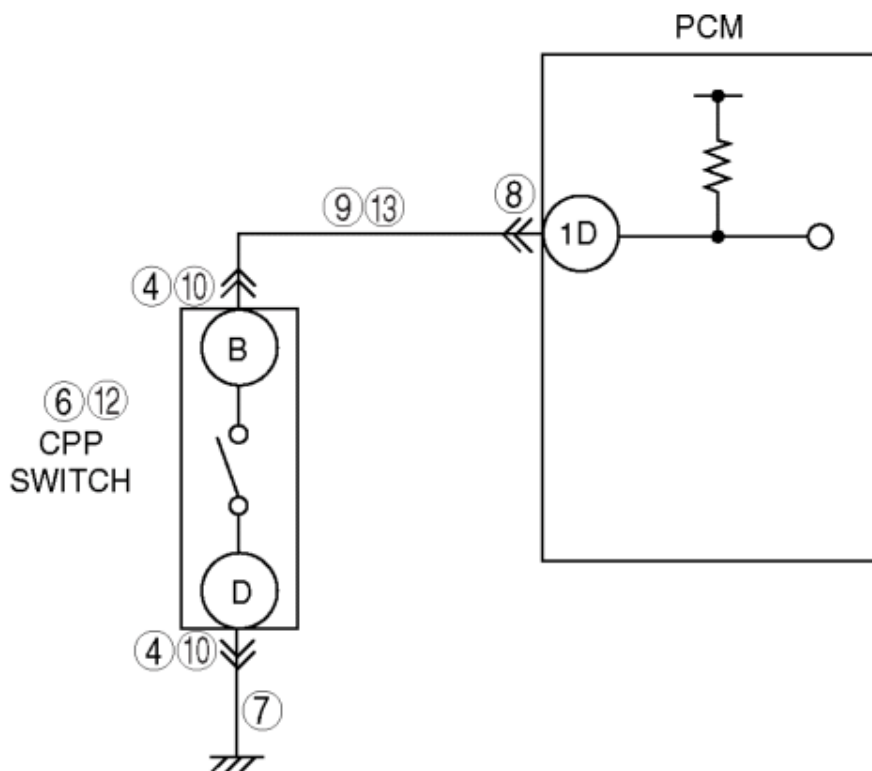
4	<b>INSPECT BRAKE SWITCH CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the brake switch connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 13.
		No	Go to the next step.
5	<b>CLASSIFY BRAKE SWITCH OR CIRCUIT</b> <ul style="list-style-type: none"> <li>• Connect the M-MDS to DLC 2.</li> <li>• Access BOO PID.</li> <li>• Connect a jumper wire between brake switch No.1 terminal B and D.</li> <li>• Is BOO PID on?</li> </ul>	Yes	Go to the next step.
		No	Go to Step 7.
6	<b>INSPECT BRAKE SWITCH</b> <ul style="list-style-type: none"> <li>• Inspect the brake switch. (See <b>BRAKE SWITCH INSPECTION</b>.)</li> <li>• Is the brake switch normal?</li> </ul>	Yes	Go to Step 13.
		No	Replace the brake switch, then go to Step 13. (See <b>BRAKE PEDAL REMOVAL/INSTALLATION</b> .)
7	<b>INSPECT BRAKE SWITCH POWER CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Measure the voltage between brake switch terminal B and body ground.</li> <li>• Is the voltage <b>B+</b>?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the brake switch power circuit for open, then go to Step 13.
8	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the PCM connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 13.
		No	Go to the next step.
9	<b>INSPECT BRAKE SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between brake switch terminal D and PCM terminal 1AB.</li> <li>• Is there continuity?</li> </ul>	Yes	Go to Step 13.
		No	Repair or replace the wiring harness for an open circuit, then go to Step 13.
10	<b>CLASSIFY BRAKE SWITCH OR CIRCUIT</b> <ul style="list-style-type: none"> <li>• Connect the M-MDS to DLC 2.</li> <li>• Access BOO PID.</li> <li>• Verify that BOO PID changes from ON to OFF when the brake switch connector disconnected.</li> <li>• Does BOO PID change from ON to OFF?</li> </ul>	Yes	Go to the next step.
		No	Go to Step 12.

11	<b>INSPECT BRAKE SWITCH</b> <ul style="list-style-type: none"> <li>Inspect the brake switch.</li> <li>(See <a href="#">BRAKE SWITCH INSPECTION</a>.)</li> <li>Is the brake switch normal?</li> </ul>	Yes	Go to Step 13.
		No	Replace the brake switch, then go to Step 13. (See <a href="#">BRAKE PEDAL REMOVAL/INSTALLATION</a> .)
12	<b>INSPECT BRAKE SWITCH SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>Measure the voltage between brake switch terminal D and body ground.</li> <li>Is the voltage <b>B+</b>?</li> </ul>	Yes	Repair or replace the wiring harness for short to power supply, then go to the next step.
		No	Go to the next step.
13	<b>VERIFY TROUBLESHOOTING OF DTC P0703 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Drive the vehicle <b>30 km/h {18.6 mph} or more</b>.</li> <li>Depress and release the brake pedal <b>more than 8 times</b> while driving vehicle.</li> <li>Is the PENDING CODE for this DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step. (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
14	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the "AFTER REPAIR PROCEDURE".</li> <li>(See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</li> <li>Are any DTC present?</li> </ul>	Yes	Go to the applicable DTC troubleshooting. (See <a href="#">DTC TABLE [LF]</a> .)
		No	Troubleshooting completed.

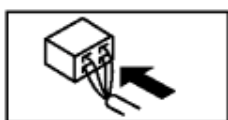
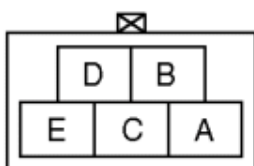
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DTC P0704 [LF]

DTC P0704	Clutch pedal position (CPP) switch input circuit problem
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors changes in input voltage from the CPP switch. If the PCM does not detect the voltage changes while the vehicle runs with vehicle speed <b>above 30 km/h {19 mph}</b> and stops <b>8 times</b> alternately, the PCM determines that the CPP switch circuit has a malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (CCM).</li><li>• The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• CPP switch malfunction</li><li>• Poor connection of CPP switch connector or PCM connector</li><li>• Short to ground in wiring harness between CPP switch terminal B and PCM terminal 1D</li><li>• Open circuit in wiring harness between CPP switch terminal B and PCM terminal 1D</li><li>• Open circuit in wiring harness between ground and CPP switch terminal D</li><li>• PCM malfunction</li></ul>

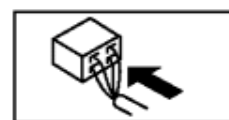


CPP SWITCH  
WIRING HARNESS-SIDE CONNECTOR



PCM  
WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.

3	<b>CLASSIFY HIGH INPUT OR LOW INPUT</b> <ul style="list-style-type: none"> <li>• Connect the M-MDS to DLC 2.</li> <li>• Access CPP PID.</li> <li>• Verify CPP PID during clutch pedal operation.</li> <li>• Is CPP PID always OFF?</li> </ul>	Yes	Go to the next step.
		No	Go to Step 10.
4	<b>INSPECT CPP SWITCH CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the CPP switch connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 14.
		No	Go to the next step.
5	<b>CLASSIFY CPP SWITCH OR CIRCUIT</b> <ul style="list-style-type: none"> <li>• Connect the M-MDS to DLC 2.</li> <li>• Access CPP PID.</li> <li>• Connect a jumper wire between CPP switch terminal B and D.</li> <li>• Is CPP PID on?</li> </ul>	Yes	Go to the next step.
		No	Go to Step 7.
6	<b>INSPECT CPP SWITCH</b> <ul style="list-style-type: none"> <li>• Inspect the CPP switch.</li> <li>(See <b>CLUTCH PEDAL POSITION (CPP) SWITCH INSPECTION [LF]</b>.)</li> <li>• Is the CPP switch normal?</li> </ul>	Yes	Go to Step 14.
		No	Replace the CPP switch, then go to Step 14.
7	<b>INSPECT CPP SWITCH GROUND CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between CPP switch terminal D and ground.</li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the CPP switch power supply for an open circuit, then go to Step 14.
8	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the PCM connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 14.
		No	Go to the next step.
9	<b>INSPECT CPP SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between CPP switch</li> </ul>	Yes	Repair or replace the wiring harness for an open circuit, then go to Step 14.



	terminal B and PCM terminal 1D.		No	Go to Step 14.
	<ul style="list-style-type: none"> <li>Is there continuity?</li> </ul>			
10	<b>INSPECT CPP SWITCH CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the CPP switch connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 14.	
		No	Go to the next step.	
11	<b>CLASSIFY CPP SWITCH OR CIRCUIT</b> <ul style="list-style-type: none"> <li>Connect the M-MDS to DLC 2.</li> <li>Access CPP PID.</li> <li>Verify that CPP PID changes from ON to OFF when CPP switch connector disconnected.</li> <li>Does CPP PID change from ON to OFF?</li> </ul>	Yes	Go to the next step.	
		No	Go to Step 13.	
12	<b>INSPECT CPP SWITCH</b> <ul style="list-style-type: none"> <li>Inspect the CPP switch.</li> </ul> <p>(See <b>CLUTCH PEDAL POSITION (CPP) SWITCH INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>Is the CPP switch normal?</li> </ul>	Yes	Go to Step 14.	
		No	Replace the CPP switch, then go to Step 14.	
13	<b>INSPECT CPP SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>Inspect for continuity between CPP switch terminal B and ground.</li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness for short to ground, then go to the next step.	
		No	Go to the next step.	
14	<b>VERIFY TROUBLESHOOTING OF DTC P0704 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Start the engine.</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Operate the clutch pedal while the vehicle runs and stops <b>8 times</b> alternately.</li> <li>Is the PENDING CODE for this DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step. (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)	
		No	Go to the next step.	
15	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the "AFTER REPAIR PROCEDURE".</li> </ul>	Yes	Go to the applicable DTC troubleshooting. (See <b>DTC TABLE [LF]</b> .)	

	(See <b>AFTER REPAIR PROCEDURE [LF]</b> .)		
	• Are any DTC present?	No	Troubleshooting completed.

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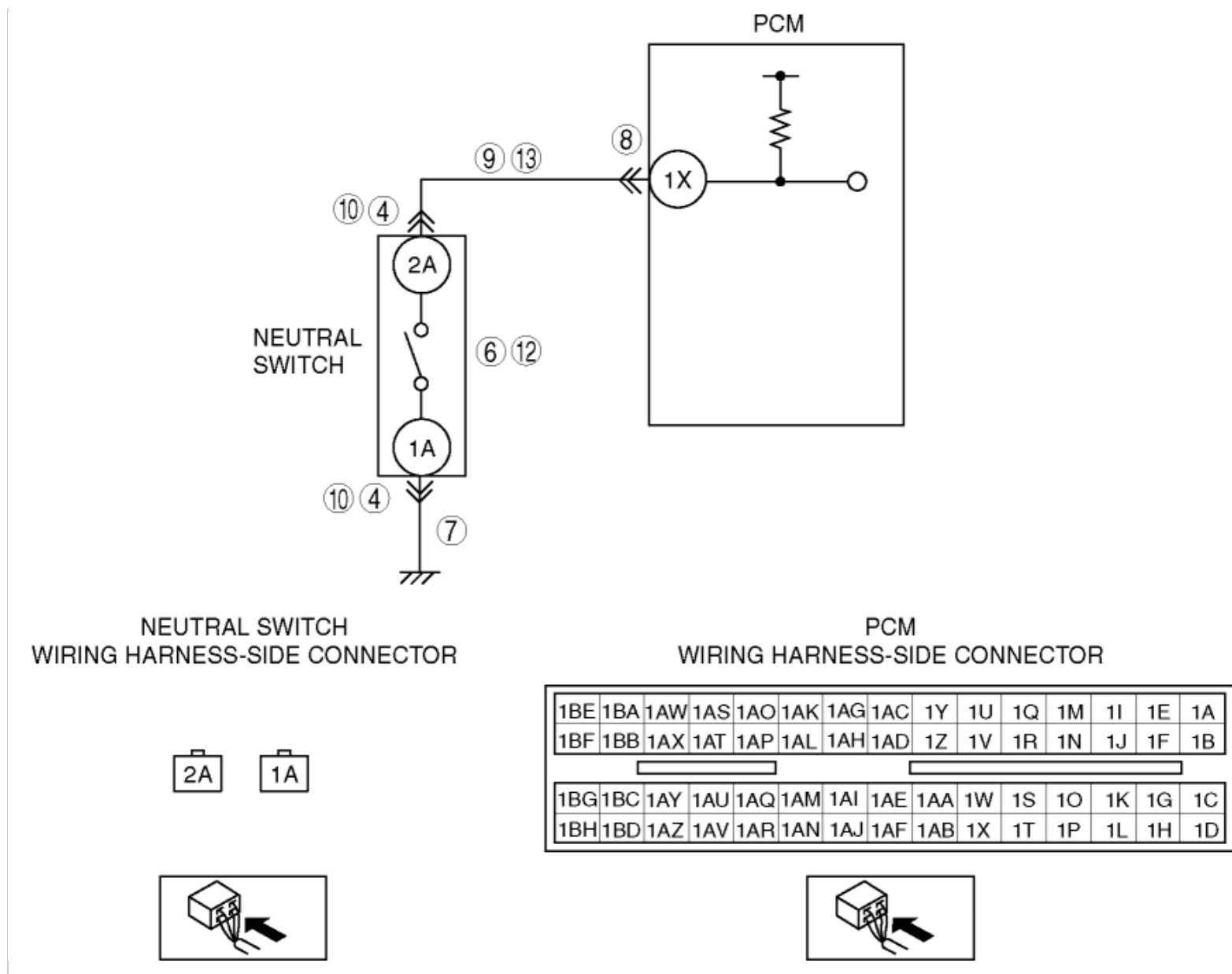
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DTC P0850 [LF]

DTC P0850	Neutral switch input circuit problem
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors changes in input voltage from the neutral switch. If the PCM does not detect the voltage changes while driving the vehicle at a vehicle speed <b>above 30 km/h {19 mph}</b> and clutch pedal turns press and depress <b>10 times</b> repeatedly, the PCM determines that the neutral switch circuit has a malfunction</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (CCM).</li><li>• The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Neutral switch malfunction</li><li>• Poor connection of neutral switch connector or PCM connector</li><li>• Short to ground in wiring harness between neutral switch terminal 2A and PCM terminal 1X</li><li>• Open circuit in wiring harness between neutral switch terminal 2A and PCM terminal 1X</li><li>• Open circuit in wiring harness between ground and neutral switch terminal 1A</li><li>• PCM malfunction</li></ul>



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>CLASSIFY HIGH INPUT OR LOW INPUT</b>	Yes Go to the next step.

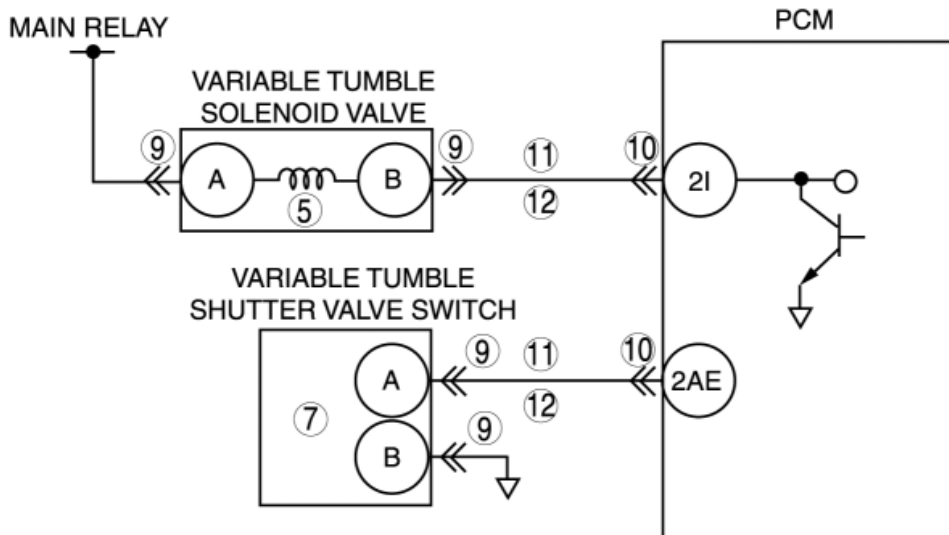
	<p>Connect the M-MDS to DLC 2.</p> <ul style="list-style-type: none"> <li>• Access CPP/PNP PID.</li> <li>• Verify CPP/PNP PID when gear is neutral position.</li> <li>• Is CPP/PNP PID always off?</li> </ul>		No	Go to Step 10.
4	<p><b>INSPECT NEUTRAL SWITCH CONNECTOR FOR POOR CONNECTION</b></p> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect neutral switch connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 14.	
		No	Go to the next step.	
5	<p><b>CLASSIFY NEUTRAL SWITCH OR CIRCUIT</b></p> <ul style="list-style-type: none"> <li>• Connect the M-MDS to the DLC 2.</li> <li>• Access CPP/PNP PID.</li> <li>• Connect a jumper wire between neutral switch terminal 1A and 2A.</li> <li>• Is CPP/PNP PID on?</li> </ul>	Yes	Go to the next step.	
		No	Go to Step 7.	
6	<p><b>INSPECT NEUTRAL SWITCH</b></p> <ul style="list-style-type: none"> <li>• Inspect the neutral switch.</li> </ul> <p>(See <a href="#">NEUTRAL SWITCH INSPECTION [LF]</a>.)</p> <ul style="list-style-type: none"> <li>• Is the neutral switch normal?</li> </ul>	Yes	Go to Step 14.	
		No	Replace the neutral switch, then go to Step 14.	
7	<p><b>INSPECT NEUTRAL SWITCH GROUND CIRCUIT FOR OPEN CIRCUIT</b></p> <ul style="list-style-type: none"> <li>• Inspect for continuity between neutral switch terminal 1A and ground.</li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.	
		No	Repair or replace the neutral switch ground circuit for an open circuit, then Go to Step 14.	
8	<p><b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b></p> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the PCM connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 14.	
		No	Go to the next step.	
9	<p><b>INSPECT NEUTRAL SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT</b></p> <ul style="list-style-type: none"> <li>• Inspect for continuity between neutral switch terminal 2A and PCM terminal 1X.</li> <li>• Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness for an open circuit, then go to Step 14.	
		No	Go to Step 14.	
10	<p><b>INSPECT NEUTRAL SWITCH CONNECTOR FOR POOR CONNECTION</b></p>	Yes	Repair or replace the terminal, then go to Step 14.	

	<p>Turn the ignition switch off.</p> <ul style="list-style-type: none"> <li>• Disconnect the neutral switch connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>		No	Go to the next step.
11	<p><b>CLASSIFY NEUTRAL SWITCH OR CIRCUIT</b></p> <ul style="list-style-type: none"> <li>• Connect the M-MDS to DLC 2.</li> <li>• Access CPP/PNP PID.</li> <li>• Verify that CPP/PNP PID changes from ON to OFF when the neutral switch connector disconnected.</li> <li>• Does CPP/PNP PID change from ON to OFF?</li> </ul>	Yes		Go to the next step.
		No		Go to Step 13.
12	<p><b>INSPECT NEUTRAL SWITCH</b></p> <ul style="list-style-type: none"> <li>• Inspect the neutral switch.</li> </ul> <p>(See <a href="#">NEUTRAL SWITCH INSPECTION [LF]</a>.)</p> <ul style="list-style-type: none"> <li>• Is the neutral switch normal?</li> </ul>	Yes		Go to Step 14.
		No		Replace the neutral switch, then go to Step 14.
13	<p><b>INSPECT NEUTRAL SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND</b></p> <ul style="list-style-type: none"> <li>• Inspect for continuity between neutral switch terminal 2A and ground.</li> <li>• Is there continuity?</li> </ul>	Yes		Repair or replace the wiring harness for short to ground, then go to the next step.
		No		Go to the next step.
14	<p><b>VERIFY TROUBLESHOOTING OF DTC P0850 COMPLETED</b></p> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Start the engine.</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Drive the vehicle <b>above 30 km/h {19 mph}</b> and stop vehicle.</li> <li>• Depress and release the clutch pedal <b>more than 10 times</b> during drive cycle.</li> <li>• Is the PENDING CODE for this DTC present?</li> </ul>	Yes		Replace the PCM, then go to the next step.
		No		Go to the next step.
15	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"> <li>• Perform the "AFTER REPAIR PROCEDURE".</li> </ul> <p>(See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</p> <ul style="list-style-type: none"> <li>• Are any DTC present?</li> </ul>	Yes		Go to the applicable DTC troubleshooting.
		No		Troubleshooting completed.

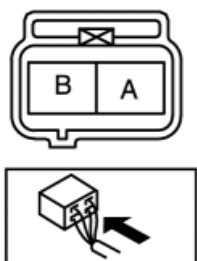
2008 - MX-5 - Engine

DTC P2004 [LF]

DTC P2004	Variable tumble shutter valve stuck open
DETECTION CONDITION	<ul style="list-style-type: none"><li>PCM monitors mass variable tumble shutter valve position using variable tumble shutter valve switch. If PCM turns the variable tumble solenoid valve on but variable tumble shutter valve position still remain open (variable tumble shutter valve switch off), PCM determines that variable tumble shutter valve has been stuck open.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>This is a continuous monitor (CCM).</li><li>MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM.</li><li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li><li>FREEZE FRAME DATA is available.</li><li>DTC is stored in PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Variable tumble shutter valve actuator malfunction (stuck open)</li><li>Misconnected or pulled out vacuum hose</li><li>Variable tumble solenoid valve malfunction</li><li>Open circuit in wiring between variable tumble solenoid valve terminal B and PCM terminal 2I</li><li>Short to power in wiring between variable tumble solenoid valve terminal B and PCM terminal 2I</li><li>Open circuit in wiring between variable tumble shutter valve switch terminal A and PCM terminal 2AE</li><li>Short to power in wiring between variable tumble shutter valve switch terminal A and PCM terminal 2AE</li><li>PCM malfunction</li></ul>

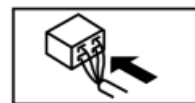


VARIABLE TUMBLE SOLENOID VALVE  
HARNESS SIDE CONNECTOR

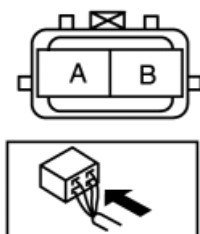


PCM  
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



VARIABLE TUMBLE SHUTTER VALVE SWITCH  
HARNESS SIDE CONNECTOR



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record FREEZE FRAME DATA on repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.



3	<b>CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN</b> <ul style="list-style-type: none"> <li>Clear the DTC from the PCM memory using the M–MDS.</li> <li>Drive vehicle under following conditions: <ul style="list-style-type: none"> <li>Engine coolant temperature is <b>below 63 °C {145 °F}</b>.</li> <li>Engine speed: <b>below 3,750 rpm</b></li> <li>Throttle opening angle is below as followings <ul style="list-style-type: none"> <li>Engine speed <b>below 1,500 rpm: above 35%</b></li> <li>Engine speed <b>between 1,500—2,500 rpm: between 25—35%</b></li> <li>Engine speed <b>above 2,500: below 25%</b></li> </ul> </li> </ul> </li> <li>Is PENDING CODE for this DTC present?</li> </ul>	Yes	Go to the next step.
		No	Intermittent concern exists. Go to <b>INTERMITTENT CONCERN TROUBLESHOOTING</b> procedure.  (See <b>INTERMITTENT CONCERN TROUBLESHOOTING [LF]</b> .)
4	<b>VERIFY STORED OTHER DTCS</b> <ul style="list-style-type: none"> <li>Verify stored DTCs using the M–MDS.</li> <li>Is DTC P2088 or P2089 present?</li> </ul>	Yes	Go to appropriate DTC troubleshooting procedures.
		No	Go to the next step.
5	<b>INSPECT VARIABLE TUMBLE SOLENOID VALVE</b> <ul style="list-style-type: none"> <li>Perform “VARIABLE TUMBLE SOLENOID VALVE INSPECTION”. (See <b>VARIABLE TUMBLE SOLENOID VALVE INSPECTION [LF]</b>.)</li> <li>Is variable tumble solenoid valve normal?</li> </ul>	Yes	Go to the next step.
		No	Replace variable tumble control solenoid valve, then go to Step 13.
6	<b>INSPECT VARIABLE TUMBLE SHUTTER VALVE ACTUATOR</b> <ul style="list-style-type: none"> <li>Perform “VARIABLE TUMBLE SHUTTER VALVE ACTUATOR INSPECTION”. (See <b>VARIABLE TUMBLE SHUTTER VALVE SWITCH INSPECTION [LF]</b>.)</li> <li>Is variable tumble shutter valve actuator normal?</li> </ul>	Yes	Go to the next step.
		No	Replace Intake manifold, then go to Step 13.
7	<b>INSPECT VARIABLE TUMBLE SHUTTER VALVE SWITCH</b> <ul style="list-style-type: none"> <li>Perform “VARIABLE TUMBLE SHUTTER VALVE SWITCH INSPECTION”. (See <b>VARIABLE TUMBLE SHUTTER VALVE SWITCH INSPECTION [LF]</b>.)</li> <li>Is variable tumble shutter valve switch normal?</li> </ul>	Yes	Go to the next step.
		No	Replace intake manifold, then go to Step 13.
8	<b>VERIFY CONNECTION OF VACUUM HOSE ROUTING</b> <ul style="list-style-type: none"> <li>Verify that the vacuum hoses are connected properly. (See <b>INTAKE-AIR SYSTEM VACUUM HOSE ROUTING DIAGRAM [LF]</b>.)</li> <li>Are vacuum hoses connected properly?</li> </ul>	Yes	Go to the next step.
		No	Connect the vacuum hoses properly, then go to the next step.
9	<b>INSPECT VARIABLE TUMBLE SOLENOID VALVE OR VARIABLE TUMBLE SHUTTER VALVE SWITCH CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition switch to OFF.</li> <li>Disconnect the variable tumble solenoid valve connector and variable tumble shutter valve switch connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out</li> </ul>	Yes	Repair or replace the terminal, then go to Step 13.
		No	Go to the next step.

	<p>pins, corrosion).</p> <ul style="list-style-type: none"> <li>Is there any malfunction?</li> </ul>		
10	<p><b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b></p> <ul style="list-style-type: none"> <li>Turn ignition switch to OFF.</li> <li>Disconnect PCM connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	<p>Yes Repair or replace the terminal, then go to Step 13.</p> <p>No Go to the next step.</p>	
11	<p><b>INSPECT VARIABLE TUMBLE SOLENOID VALVE OR VARIABLE TUMBLE SHUTTER VALVE SWITCH SIGNAL CIRCUIT FOR OPEN CIRCUIT</b></p> <ul style="list-style-type: none"> <li>Inspect continuity between the following terminal: <ul style="list-style-type: none"> <li>Variable tumble solenoid valve terminal B (wiring harness-side) and PCM terminal 2I (wiring harness-side).</li> <li>Variable tumble shutter valve switch terminal A (wiring harness-side) and PCM terminal 2AE (wiring harness-side).</li> </ul> </li> <li>Is there continuity?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Repair or replace harness for open circuit, then go to Step 13.</p>	
12	<p><b>INSPECT VARIABLE TUMBLE SOLENOID VALVE OR VARIABLE TUMBLE SHUTTER VALVE SWITCH CIRCUIT FOR SHORT TO POWER SUPPLY</b></p> <ul style="list-style-type: none"> <li>Disconnect the variable tumble solenoid valve connector and variable tumble shutter valve switch connector.</li> <li>Turn ignition switch to ON (Engine off).</li> <li>Measure voltage between the following terminal and body ground. <ul style="list-style-type: none"> <li>PCM terminal 2I (wiring harness-side).</li> <li>PCM terminal 2AE (wiring harness-side).</li> </ul> </li> <li>Is voltage <b>B+</b>?</li> </ul>	<p>Yes Repair or replace harness for short to power supply, then go to the next step.</p> <p>No Go to the next step.</p>	
13	<p><b>VERIFY TROUBLESHOOTING OF DTC P2004 COMPLETED</b></p> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Start engine.</li> <li>Clear the DTC from the PCM memory using the M–MDS.</li> <li>Start engine.</li> <li>Drive vehicle under following conditions: <ul style="list-style-type: none"> <li>Engine coolant temperature is <b>below 63 °C {145 °F}</b>.</li> <li>Engine speed: <b>below 3,750 rpm</b></li> <li>Throttle opening angle is below as followings <ul style="list-style-type: none"> <li>Engine speed <b>below 1,500 rpm: above 35%</b></li> <li>Engine speed <b>between 1,500—2,500 rpm: between 25–35 %</b></li> <li>Engine speed <b>above 2,500: below 25 %</b></li> </ul> </li> </ul> </li> <li>Is PENDING CODE for this DTC present?</li> </ul>	<p>Yes Replace PCM, then go to the next step. (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a>.)</p> <p>No Go to the next step.</p>	

14	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>Perform the “After Repair Procedure”. (See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</li><li>Is any DTC present?</li></ul>	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.

2008 - MX-5 - Engine

DTC P2006 [LF]

DTC P2006	Variable tumble shutter valve stuck closed
DETECTION CONDITION	<ul style="list-style-type: none"><li>PCM monitors mass variable tumble shutter valve position using variable tumble shutter valve switch. If variable tumble turns variable tumble solenoid valve off but variable tumble shutter valve position still remain close (variable tumble shutter valve position sensor on), PCM determines that variable tumble shutter valve has been stuck closed.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>This is a continuous monitor (CCM).</li><li>MIL illuminates if PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while DTC for the same malfunction has been stored in PCM.</li><li>PENDING CODE is available if PCM detects the above malfunction condition during first drive cycle.</li><li>FREEZE FRAME DATA is available.</li><li>DTC is stored in PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>ECT sensor malfunction</li><li>TP sensor malfunction</li><li>CKP sensor malfunction</li><li>Variable tumble solenoid valve malfunction</li><li>Variable tumble shutter valve malfunction (stuck closed)</li><li>Variable tumble shutter valve actuator malfunction (stuck closed).</li><li>Short to ground circuit between variable tumble control solenoid valve terminal B and PCM terminal 2I</li><li>Short to ground in wiring between variable tumble shutter valve switch terminal A and PCM terminal 2AE</li><li>PCM malfunction</li></ul>

Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record FREEZE FRAME DATA on repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>CLASSIFY INTERMITTENT CONCERN OR CONTINUOUS CONCERN</b> <ul style="list-style-type: none"> <li>Clear the DTC from the PCM memory using the M MDS.</li> <li>Drive vehicle under following conditions: <ul style="list-style-type: none"> <li>Engine coolant temperature is <b>above 63 °C {145 °F}</b>.</li> <li>Engine speed: <b>below 3,750 rpm</b></li> <li>Throttle opening angle is below as followings <ul style="list-style-type: none"> <li>Engine speed <b>below 1,500 rpm: above 35%</b></li> <li>Engine speed <b>between 1,500—2,500 rpm: between 25—35%</b></li> <li>Engine speed <b>above 2,500: below 25%</b></li> </ul> </li> </ul> </li> </ul>	Yes Go to the next step.
		No Intermittent concern exists. Go to INTERMITTENT CONCERN TROUBLESHOOTING procedure.  (See <b>INTERMITTENT CONCERN TROUBLESHOOTING [LF]</b> .)

	<ul style="list-style-type: none"> <li>Is PENDING CODE for this DTC present?</li> </ul>		
4	<b>VERIFY STORED OTHER DTCS</b> <ul style="list-style-type: none"> <li>Verify stored DTCs using M MDS or equipment.</li> <li>Is other DTC present except P0117, P0118, P0122, P0123 and/or P0335?</li> </ul>	Yes	Go to appropriate DTC troubleshooting procedures.
		No	Go to the next step.
5	<b>INSPECT VARIABLE TUMBLE SHUTTER VALVE ACTUATOR</b> <ul style="list-style-type: none"> <li>Perform "Variable Tumble System Operation Inspection". (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b>.)</li> <li>Is variable tumble shutter valve actuator normal?</li> </ul>	Yes	Go to the next step.
		No	Replace variable tumble shutter valve actuator, then go to Step 10.
6	<b>INSPECT VARIABLE TUMBLE SOLENOID VALVE</b> <ul style="list-style-type: none"> <li>Perform "variable tumble solenoid valve airflow inspection". (See <b>VARIABLE TUMBLE SOLENOID VALVE INSPECTION [LF]</b>.)</li> <li>Is variable tumble solenoid valve normal?</li> </ul>	Yes	Go to the next step.
		No	Replace variable tumble solenoid valve, then go to Step 10.
7	<b>INSPECT VARIABLE TUMBLE SOLENOID VALVE OR VARIABLE TUMBLE SHUTTER VALVE SWITCH CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition switch to OFF.</li> <li>Disconnect the variable tumble solenoid valve connector and variable tumble shutter valve switch connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair terminal, then go to Step 10.
		No	Go to the next step.
8	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Inspect for poor connection at PCM terminals (such as damaged, pulled-out terminals, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair terminal, then go to Step 10.
		No	Go to the next step.
9	<b>INSPECT VARIABLE TUMBLE SOLENOID VALVE OR VARIABLE TUMBLE SHUTTER VALVE SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>Inspect continuity between the following terminal and body ground.</li> </ul>	Yes	Repair or replace harness for short to ground, then go to the next step.
		No	Go to the next step.

	<p>PCM terminal 2I (wiring harness-side).</p> <ul style="list-style-type: none"> <li>▪ PCM terminal 2AE (wiring harness-side).</li> </ul> <ul style="list-style-type: none"> <li>• Is there continuity?</li> </ul>		
10	<p><b>VERIFY TROUBLESHOOTING OF DTC P2006 COMPLETED</b></p> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Start engine.</li> <li>• Clear the DTC from the PCM memory using the M MDS.</li> <li>• Start engine.</li> <li>• Drive vehicle under following conditions: <ul style="list-style-type: none"> <li>▪ Engine coolant temperature is <b>above 63 °C {145 °F}</b>.</li> <li>▪ Engine speed: <b>below 3,750 rpm</b></li> <li>▪ Throttle opening angle is below as followings <ul style="list-style-type: none"> <li>• Engine speed <b>below 1,500 rpm: above 35%</b></li> <li>• Engine speed <b>between 1,500—2,500 rpm: between 25—35%</b></li> <li>• Engine speed <b>above 2,500: below 25%</b></li> </ul> </li> </ul> </li> <li>• Is PENDING CODE for this DTC present?</li> </ul>	<p>Yes Replace PCM, then go to the next step.</p> <p>(See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a>.)</p>	<p>No Go to the next step.</p>
11	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"> <li>• Perform the “After Repair Procedure”.</li> </ul> <p>(See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</p>	<p>Yes Go to the applicable DTC inspection.</p> <p>(See <a href="#">DTC TABLE [LF]</a>.)</p>	

- |  |   |    |                            |
|--|---|----|----------------------------|
|  | <ul style="list-style-type: none"><li>• Is any DTC present?</li></ul> | No | Troubleshooting completed. |
|--|---|----|----------------------------|

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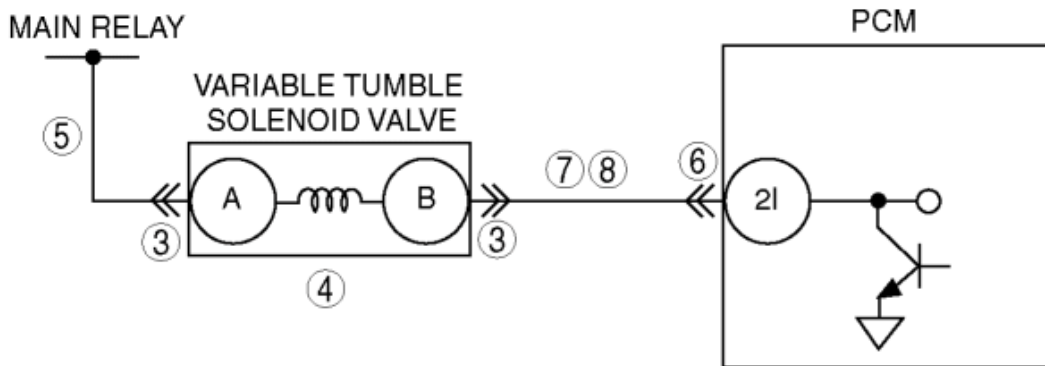
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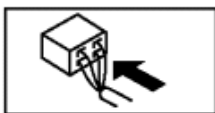
2008 - MX-5 - Engine

DTC P2009 [LF]

DTC P2009	Variable tumble solenoid valve circuit low input
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors variable tumble solenoid valve control signal. If the PCM turns variable tumble solenoid valve off but voltage still remains low, the PCM determines that variable tumble solenoid valve circuit has a malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (CCM).</li><li>• The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle.</li><li>• FREEZE FRAME DATA is available.</li><li>• Are any DTCs is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Poor connection of connectors at PCM and/or variable tumble solenoid valve</li><li>• Short to ground in wiring harness between variable tumble solenoid valve terminal B and PCM terminal 2I</li><li>• Open circuit in wiring harness between main relay and variable tumble solenoid valve terminal A</li><li>• Open circuit in wiring harness between variable tumble solenoid valve terminal B and PCM terminal 2I</li><li>• Variable tumble solenoid valve malfunction</li><li>• PCM malfunction</li></ul>

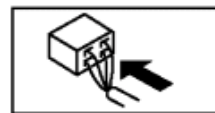


VARIABLE TUMBLE SOLENOID VALVE  
WIRING HARNESS-SIDE CONNECTOR



PCM  
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



## Diagnostic procedure

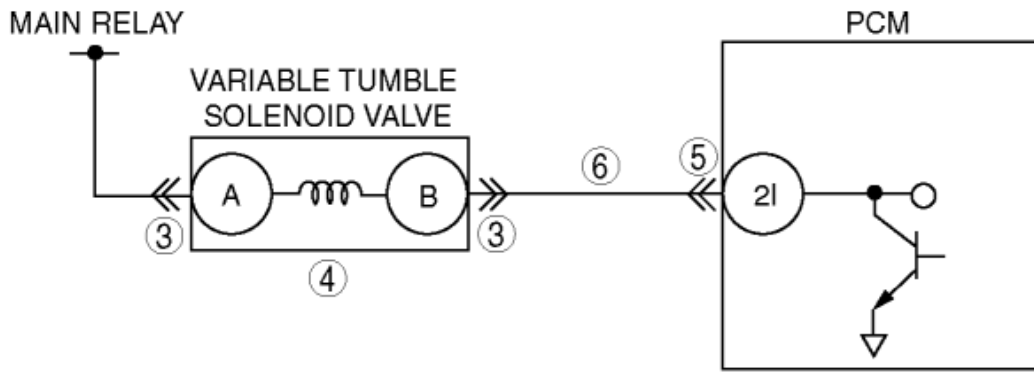
STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>INSPECT VARIABLE TUMBLE SOLENOID VALVE CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace the terminal, then go to Step 9.
		No Go to the next step.
4	<b>INSPECT VARIABLE TUMBLE SOLENOID VALVE</b> <ul style="list-style-type: none"> <li>Perform the variable tumble solenoid valve inspection.</li> </ul>	Yes Go to the next step.

	<p>(See <a href="#">VARIABLE TUMBLE SOLENOID VALVE INSPECTION [LF].</a>)</p> <ul style="list-style-type: none"> <li>Is variable tumble solenoid valve normal?</li> </ul>	No	Replace the variable tumble solenoid valve, then go to Step 9.
5	<p><b>INSPECT VARIABLE TUMBLE SOLENOID VALVE POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT</b></p> <ul style="list-style-type: none"> <li>Disconnect the variable tumble solenoid valve connector.</li> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Measure the voltage between variable tumble solenoid valve terminal A (wiring harness-side) and body ground.</li> <li>Is the voltage <b>B+</b>?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to Step 9.
6	<p><b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the PCM connector.</li> <li>Inspect for poor connection at PCM terminal 2I. (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair the terminal, then go to Step 9.
		No	Go to the next step.
7	<p><b>INSPECT VARIABLE TUMBLE SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO GROUND</b></p> <ul style="list-style-type: none"> <li>Inspect for continuity between variable tumble solenoid valve terminal B (wiring harness-side) and body ground.</li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness for short to ground, then go to Step 9.
		No	Go to the next step.
8	<p><b>INSPECT VARIABLE TUMBLE SOLENOID VALVE CONTROL CIRCUIT FOR OPEN CIRCUIT</b></p> <ul style="list-style-type: none"> <li>Inspect for continuity between variable tumble solenoid valve terminal B (wiring harness-side) and PCM terminal 2I (wiring harness-side).</li> <li>Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to the next step.
9	<p><b>VERIFY TROUBLESHOOTING OF DTC P2009 COMPLETED</b></p> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the PCM memory using the M MDS.</li> <li>Start the engine.</li> <li>Is the PENDING CODE for this DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step.  (See <a href="#">PCM REMOVAL/INSTALLATION [LF].</a> )
		No	Go to the next step.
10	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"> <li>Perform the "AFTER REPAIR PROCEDURE". (See <a href="#">AFTER REPAIR PROCEDURE [LF].</a>)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to the applicable DTC inspection.  (See <a href="#">DTC TABLE [LF].</a> )
		No	Troubleshooting completed.

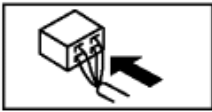
2008 - MX-5 - Engine

DTC P2010 [LF]

DTC P2010	Variable tumble solenoid valve circuit high input
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors the variable tumble solenoid valve control signal. If the PCM turns variable tumble solenoid valve on but the voltage still remains high, the PCM determines that the variable tumble solenoid valve circuit has a malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (CCM).</li><li>• The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition during first drive cycle.</li><li>• FREEZE FRAME DATA is available.</li><li>• Are any DTCs is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Poor connection of connectors at PCM and/or variable tumble solenoid valve</li><li>• Short to power supply in wiring harness between variable tumble solenoid valve terminal B and PCM terminal 21</li><li>• Variable tumble solenoid valve malfunction</li><li>• PCM malfunction</li></ul>

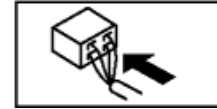


VARIABLE TUMBLE SOLENOID VALVE  
WIRING HARNESS-SIDE CONNECTOR



PCM  
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Check for related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>INSPECT VARIABLE TUMBLE SOLENOID VALVE CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace the terminal, then go to Step 7.
		No Go to the next step.
4	<b>INSPECT VARIABLE TUMBLE SOLENOID VALVE</b> <ul style="list-style-type: none"> <li>Inspect the variable tumble solenoid valve.</li> </ul> <p>(See <a href="#">VARIABLE TUMBLE SOLENOID VALVE</a></p>	Yes Go to the next step.
		No Replace the variable tumble solenoid valve, then go to Step 7.

	<b>INSPECTION [LF].)</b> <ul style="list-style-type: none"><li>Is the variable tumble solenoid valve normal?</li></ul>		
5	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"><li>Turn the ignition switch off.</li><li>Disconnect the PCM connector.</li><li>Inspect for poor connection at PCM terminal 21. (such as damaged/pulled-out pins, corrosion).</li><li>Is there any malfunction?</li></ul>	Yes	Repair the terminal, then go to Step 7.
		No	Go to the next step.
6	<b>INSPECT VARIABLE TUMBLE SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"><li>Remove the variable tumble solenoid valve.</li><li>Turn the ignition switch to the ON position (Engine off).</li><li>Measure the voltage between PCM terminal 21 and body ground.</li><li>Is the voltage <b>B+</b>?</li></ul>	Yes	Repair or replace the wiring harness with short to power supply, then go to the next step.
		No	Go to the next step.
7	<b>VERIFY TROUBLESHOOTING OF DTC P2010 COMPLETED</b> <ul style="list-style-type: none"><li>Make sure to reconnect all disconnected connectors.</li><li>Clear the DTC from the PCM memory using the M MDS.</li><li>Start the engine.</li><li>Is the PENDING CODE for this DTC present?</li></ul>	Yes	Replace the PCM, then go to the next step. (See <b>PCM REMOVAL/INSTALLATION [LF].)</b>
		No	Go to the next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>Perform the "AFTER REPAIR PROCEDURE". (See <b>AFTER REPAIR PROCEDURE [LF].)</b></li><li>Is any DTC present?</li></ul>	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [LF].)</b>
		No	Troubleshooting completed.

2008 - MX-5 - Engine

DTC P2088 [LF]

DTC P2088	Oil control valve (OCV) circuit low
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors the OCV voltage. If the PCM detects the OCV control voltage (calculated from the OCV) is below the threshold voltage (calculated from the battery positive voltage), the PCM determines that the OCV circuit has a malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (CCM).</li><li>• The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Poor connection at the PCM or OCV connector</li><li>• Short to ground in wiring between OCV terminal A and PCM terminal 2E</li><li>• Open circuit in wiring between the main relay and OCV terminal B</li><li>• Open circuit in wiring between OCV terminal A and PCM terminal 2E</li><li>• OCV malfunction</li><li>• PCM malfunction</li></ul>

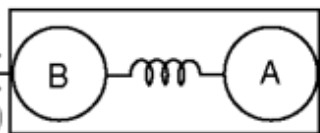
MAIN RELAY



⑤

OCV

③



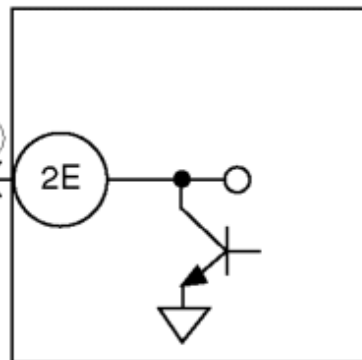
④

③

⑦ ⑧

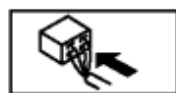
⑥

PCM



OCV

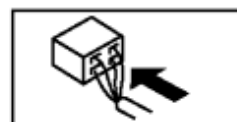
HARNESS SIDE CONNECTOR



PCM

HARNESS SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>INSPECT OCV CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace the terminal, then go to Step 9.
		No Go to the next step.



4	<b>INSPECT OCV</b> <ul style="list-style-type: none"> <li>Inspect the OCV.</li> <li>(See <b>OIL CONTROL VALVE (OCV) INSPECTION [LF].</b>)</li> <li>Is the OCV normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the OCV, then go to Step 9. (See <b>OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION [LF].</b> )
5	<b>INSPECT OCV POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Disconnect the OCV connector.</li> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Measure the voltage between variable tumble control solenoid valve terminal B (wiring harness-side) and body ground.</li> <li>Is the voltage <b>B+</b>?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to Step 9.
6	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the PCM connector.</li> <li>Inspect for poor connection at PCM terminal 2E (such as damaged, pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair the terminal, then go to Step 9.
		No	Go to the next step.
7	<b>INSPECT OCV CONTROL CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>Inspect for continuity between OCV terminal A (wiring harness-side) and body ground.</li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness for short to ground, then go to Step 9.
		No	Go to the next step.
8	<b>INSPECT OCV CONTROL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Connect the OCV connector.</li> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Inspect for continuity between OCV terminal A (wiring harness-side) and PCM terminal 2E (wiring harness-side).</li> <li>Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open or short circuit to ground, then go to the next step.
9	<b>VERIFY TROUBLESHOOTING OF DTC P2088 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> </ul>	Yes	Replace the PCM, then go to the next step. (See <b>PCM REMOVAL/INSTALLATION [LF].</b> )

	<ul style="list-style-type: none"><li>• Clear the DTC from the PCM memory using the M-MDS.</li><li>• Turn the ignition switch off.</li><li>• Start the engine and warm it up completely.</li><li>• Is the same DTC present?</li></ul>	No	Go to the next step.
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "AFTER REPAIR PROCEDURE".</li></ul> (See <b>AFTER REPAIR PROCEDURE [LF]</b> .)	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.
	<ul style="list-style-type: none"><li>• Are any DTCs present?</li></ul>		

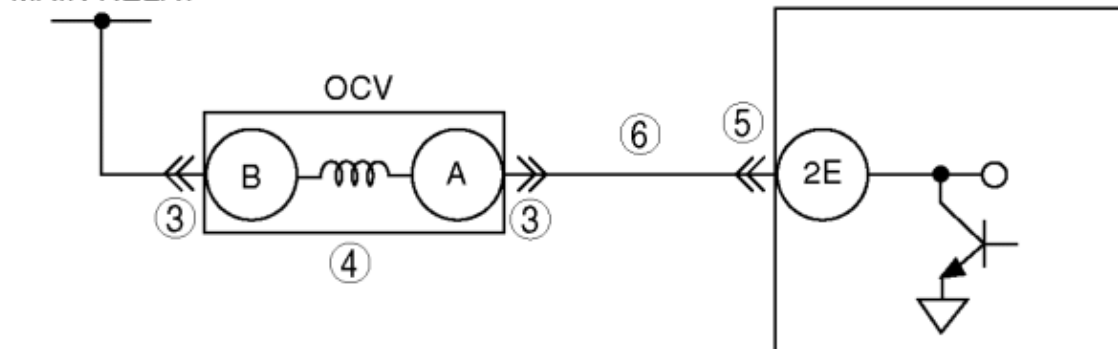
2008 - MX-5 - Engine

DTC P2089 [LF]

DTC P2089	Oil control valve (OCV) circuit high
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors the OCV voltage. If the PCM detects that the OCV control voltage (calculated from the OCV) is above the threshold voltage (calculated from battery positive voltage), the PCM determines that the OCV circuit has a malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (CCM).</li><li>• The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Poor connection at the PCM or OCV connector</li><li>• Short to power circuit in wiring between OCV terminal A and PCM terminal 2E</li><li>• OCV malfunction</li><li>• PCM malfunction</li></ul>

MAIN RELAY

PCM

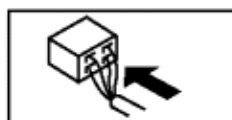


OCV

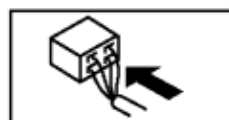
PCM

HARNESS SIDE CONNECTOR

HARNESS SIDE CONNECTOR



2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Record the FREEZE FRAME DATA on the repair order, then go to the next step.</p>
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	<p>Yes Perform repair or diagnosis according to the available repair information.</p> <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> <p>No Go to the next step.</p>
3	<b>INSPECT OCV CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	<p>Yes Repair or replace the terminal, then go to Step 7.</p> <p>No Go to the next step.</p>
	<b>INSPECT OCV</b>	

4	<ul style="list-style-type: none"> <li>Inspect the OCV.</li> </ul> <p>(See <b>OIL CONTROL VALVE (OCV) INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>Is the OCV normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the OCV, then go to Step 7.  (See <b>OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION [LF]</b> .)
5	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the PCM connector.</li> <li>Inspect for poor connection at PCM terminal 2E (such as damaged, pulled-out pins, corrosion).</li> <li>Is there malfunction?</li> </ul>	Yes	Repair the terminal, then go to Step 7.
		No	Go to the next step.
6	<b>INSPECT OCV CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>Remove the OCV.</li> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Measure the voltage between PCM terminal 2E and body ground.</li> <li>Is the voltage <b>B+</b>?</li> </ul>	Yes	Repair or replace the wiring harness for short to power supply, then go to the next step.
		No	Go to the next step.
7	<b>VERIFY TROUBLESHOOTING OF DTC P2089 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Turn the ignition switch off.</li> <li>Start the engine and warm it up completely.</li> <li>Is the same DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step.  (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)
		No	Go to the next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the "AFTER REPAIR PROCEDURE".</li> </ul> <p>(See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</p> <ul style="list-style-type: none"> <li>Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection.  (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.

## 2008 - MX-5 - Engine

### DTC P2096 [LF]

DTC P2096	Target A/F feedback system too lean
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors the target A/F fuel trim when under the target A/F feedback control. If the fuel trim is more than the specification, the PCM determines that the target A/F feedback system is too lean.</li></ul> <p><b>MONITORING CONDITION</b></p> <ul style="list-style-type: none"><li>▪ Rear HO2S voltage is <b>above 0.1 V</b></li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (Fuel system).</li><li>• The MIL illuminates if the PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Leakage exhaust gas</li><li>• Rear HO2S malfunction</li><li>• IAT sensor malfunction</li><li>• ECT sensor malfunction</li><li>• Air suction in intake air system</li><li>• Front HO2S malfunction</li><li>• MAF sensor malfunction</li><li>• Insufficient fuel line pressure</li><li>• Fuel pump unit malfunction</li><li>• Leakage fuel</li><li>• Improper operation ignition system</li></ul>

Insufficient engine compression

- Fuel injector malfunction
- PCM malfunction

## Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b> <ul style="list-style-type: none"><li>• Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Fuel system related) been recorded?</li></ul>	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"><li>• Verify related Service Bulletins and/or on-line repair information availability.</li><li>• Is any related repair information available?</li></ul>	Yes	Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"><li>• If the vehicle is not repaired, go to the next step.</li></ul>
		No	Go to the next step.
3	<b>VERIFY RELATED PENDING CODE OR STORED DTC</b> <ul style="list-style-type: none"><li>• Turn the ignition switch off then to the ON position (Engine off).</li><li>• Verify the related PENDING CODE or stored DTCs.</li><li>• Is the DTC P2177 or P2187 also present?</li></ul>	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	Go to the next step.
4	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> <ul style="list-style-type: none"><li>• Is DTC P2096 on FREEZE FRAME DATA?</li></ul>	Yes	Go to the next step.
		No	Go to FREEZE FRAME DATA DTC inspection. (See <b>DTC TABLE [LF]</b> .)
5	<b>INSPECT REAR HO2S</b> <ul style="list-style-type: none"><li>• Inspect the rear HO2S (See <b>REAR HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF]</b>.)</li><li>• Is HO2S normal?</li></ul>	Yes	Go to the next step.
		No	Visually inspect for the exhaust gas leakage between the TWC and rear HO2S. <ul style="list-style-type: none"><li>• If there is no leakage, replace the rear HO2S. (See <b>REAR HEATED OXYGEN</b></li></ul>

		<b>SENSOR (HO2S) REMOVAL/INSTALLATION [LF].)</b>  Then go to Step 17.
6	<b>VERIFY CURRENT INPUT SIGNAL STATUS</b> <ul style="list-style-type: none"><li>• Connect the M-MDS to the DLC-2.</li><li>• Verify the following PIDs. (See <b>PCM INSPECTION [LF].)</b><ul style="list-style-type: none"><li>▪ ECT</li><li>▪ MAF</li><li>▪ TP</li><li>▪ VSS</li></ul></li><li>• Are the PIDs normal?</li></ul>	YesGo to the next step.  No Inspect the malfunctioning part according to the inspection results.  Then go to Step 17.
7	<b>VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA CONDITION</b> <ul style="list-style-type: none"><li>• Connect the M-MDS to the DLC-2.</li><li>• Verify the following PIDs under the FREEZE FRAME DATA condition. (See <b>PCM INSPECTION [LF].)</b><ul style="list-style-type: none"><li>▪ ECT</li><li>▪ MAF</li><li>▪ TP</li><li>▪ VSS</li></ul></li><li>• Are the PIDs normal?</li></ul>	YesGo to the next step.  No Inspect the malfunctioning part according to the inspection results.  Then go to Step 17.
8	<b>INSPECT FRONT HO2S</b> <ul style="list-style-type: none"><li>• Inspect the front HO2S (See <b>FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF].)</b></li><li>• Is HO2S normal?</li></ul>	YesGo to the next step.  No Visually inspect for the exhaust gas leakage between the exhaust manifold and front HO2S. <ul style="list-style-type: none"><li>• If there is no leakage, replace front HO2S.  (See <b>FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF].)</b></li></ul> Then go to Step 17.
<b>VERIFY CURRENT INPUT SIGNAL STATUS OF</b>		



9	<b>MAF SENSOR</b> <ul style="list-style-type: none"> <li>• Connect the M-MDS to the DLC-2.</li> <li>• Start the engine.</li> <li>• Access the MAF PID.</li> <li>• Verify that the MAF PID changes quickly according to engine speed.</li> <li>• Is the PID normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the MAF/IAT sensor, then go to Step 17.  (See <b>MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION [LF]</b> .)
10	<b>INSPECT INTAKE AIR SYSTEM FOR EXCESSIVE AIR SUCTION</b> <ul style="list-style-type: none"> <li>• Visually inspect the hose in intake air system for looseness, cracks or damages.</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the malfunctioning part, then go to Step 17.
		No	Go to the next step.
11	<b>INSPECT FUEL LINE PRESSURE</b> <ul style="list-style-type: none"> <li>• Perform the "FUEL LINE PRESSURE INSPECTION".</li> <li>(See <b>FUEL LINE PRESSURE INSPECTION [LF]</b>.)</li> <li>• Is there any malfunction?</li> </ul>	Yes	Go to the next step.
		No	Go to Step 13.
12	<b>INSPECT FUEL SYSTEM FOR FUEL LEAKAGE</b> <ul style="list-style-type: none"> <li>• Visually inspect fuel leakage in the fuel system.</li> <li>• Is there fuel leakage?</li> </ul>	Yes	Repair or replace the malfunctioning part, then go to Step 17.
		No	Replace the fuel pump unit, then go to Step 17.  (See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF]</b> .)
13	<b>INSPECT IGNITION COIL WIRING HARNESSES</b> <ul style="list-style-type: none"> <li>• Inspect the ignition coil related wiring harness condition (intermittent open or short circuit) for all cylinders.</li> <li>• Are wiring harness conditions normal?</li> </ul>	Yes	Go to the next step.
		No	Repair the wiring harnesses, then go to Step 17.
14	<b>INSPECT IGNITION SYSTEM OPERATION</b> <ul style="list-style-type: none"> <li>• Perform spark test.</li> <li>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b>.)</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to spark test result.

	<ul style="list-style-type: none"> <li>Is strong blue spark visible at each cylinder?</li> </ul>		Then go to Step 17.
15	<b>INSPECT ENGINE COMPRESSION</b> <ul style="list-style-type: none"> <li>Inspect the engine compression. (See <b>COMPRESSION INSPECTION [LF]</b>.)</li> <li>Is there any malfunction?</li> </ul>	Yes	Go to the next step.
		No	Overhaul the engine, then go to Step 17.
16	<b>INSPECT FUEL INJECTOR</b> <ul style="list-style-type: none"> <li>Inspect the fuel injector. (See <b>FUEL INJECTOR INSPECTION [LF]</b>.)</li> <li>Is there any malfunction?</li> </ul>	Yes	Replace the fuel injector, then go to the next step.  (See <b>FUEL INJECTOR REMOVAL/INSTALLATION [LF]</b> .)
		No	Go to the next step.
17	<b>VERIFY TROUBLESHOOTING OF DTC P2096 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Perform the PCM Adaptive Memory Produce Drive Mode. (See <b>OBD-II DRIVE MODE [LF]</b>.)</li> <li>Is the PENDING CODE for this DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step.  (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)
		No	Go to the next step.
18	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the "AFTER REPAIR PROCEDURE". (See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to the applicable DTC inspection.  (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.

## 2008 - MX-5 - Engine

### DTC P2097 [LF]

DTC P2097	Target A/F feedback system too rich
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors the target A/F fuel trim when under the target A/F feedback control. If the fuel trim is less than specification, the PCM determines that the target A/F feedback system is too rich.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor. (Fuel system)</li> <li>The MIL illuminates if the PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li> <li>PENDING CODE is available if the PCM detects the above malfunction conditions during the first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Leakage exhaust gas</li> <li>Rear HO2S malfunction</li> <li>IAT sensor malfunction</li> <li>ECT sensor malfunction</li> <li>Front HO2S malfunction</li> <li>Excessive fuel line pressure</li> <li>Fuel pump unit malfunction</li> <li>Purge valve malfunction</li> <li>Insufficient engine compression</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION

1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Fuel system related) been recorded?</li> </ul>	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<b>VERIFY RELATED PENDING CODE OR STORED DTC</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off, then to the ON position (Engine off).</li> <li>Verify the related PENDING CODE or stored DTCs.</li> <li>Is the DTC P2178 or P2188 also present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	Go to the next step.
4	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> <ul style="list-style-type: none"> <li>Is DTC P2097 on FREEZE FRAME DATA?</li> </ul>	Yes	Go to the next step.
		No	Go to FREEZE FRAME DATA DTC inspection. (See <b>DTC TABLE [LF]</b> .)
5	<b>INSPECT REAR HO2S</b> <ul style="list-style-type: none"> <li>Inspect the rear HO2S  (See <b>REAR HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF]</b>.)</li> <li>Is HO2S normal?</li> </ul>	Yes	Go to the next step.
		No	Visually inspect for the exhaust gas leakage between TWC and rear HO2S. <ul style="list-style-type: none"> <li>If there is no leakage, replace rear HO2S.  (See <b>REAR HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]</b>.)</li> </ul> Then go to Step 11.
6	<b>VERIFY CURRENT INPUT SIGNAL STATUS</b> <ul style="list-style-type: none"> <li>Connect the M-MDS to the DLC-2.</li> <li>Verify the following PIDs:</li> </ul>	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results.

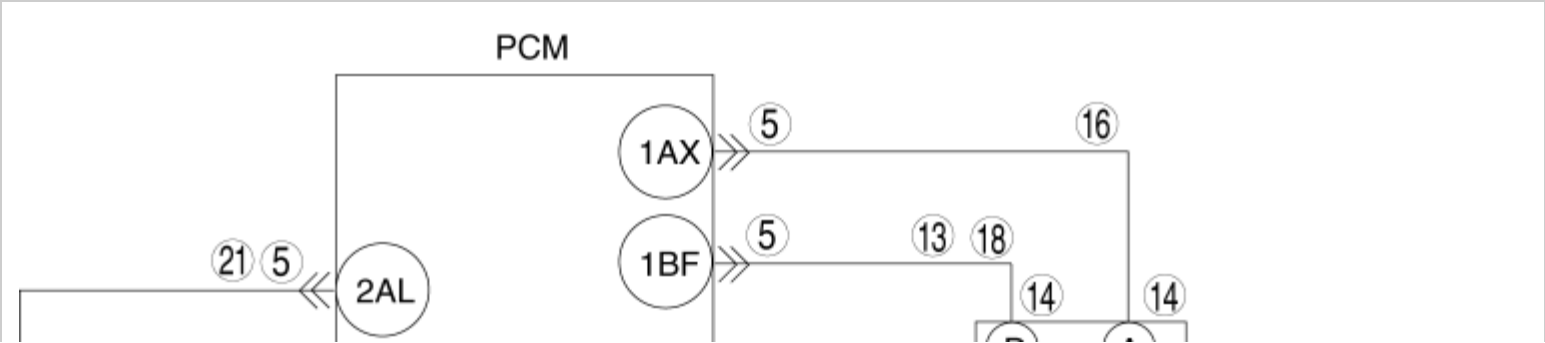
	<p>(See <b>PCM INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>▪ ECT</li> <li>▪ MAF</li> <li>▪ TP</li> <li>▪ VSS</li> </ul> <ul style="list-style-type: none"> <li>• Are the PIDs normal?</li> </ul>		Then go to Step 11.
7	<p><b>VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA CONDITION</b></p> <ul style="list-style-type: none"> <li>• Connect the M-MDS to the DLC-2.</li> <li>• Verify the following PIDs under FREEZE FRAME DATA condition.</li> </ul> <p>(See <b>PCM INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>▪ ECT</li> <li>▪ MAF</li> <li>▪ TP</li> <li>▪ VSS</li> </ul> <ul style="list-style-type: none"> <li>• Are the PIDs normal?</li> </ul>	Yes	Go to the next step.
		No	<p>Inspect the malfunctioning part according to the inspection results.</p> <p>Then go to Step 11.</p>
8	<p><b>INSPECT FRONT HO2S</b></p> <ul style="list-style-type: none"> <li>• Inspect the front HO2S</li> </ul> <p>(See <b>FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>• Is HO2S normal?</li> </ul>	Yes	Go to the next step.
		No	<p>Visually inspect for exhaust gas leakage between the exhaust manifold and front HO2S.</p> <ul style="list-style-type: none"> <li>• If there is no leakage, replace front HO2S.</li> </ul> <p>(See <b>FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]</b>.)</p> <p>Then go to Step 11.</p>
9	<p><b>INSPECT FUEL LINE PRESSURE</b></p> <ul style="list-style-type: none"> <li>• Perform the "FUEL LINE PRESSURE INSPECTION".</li> </ul> <p>(See <b>FUEL LINE PRESSURE INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>• Is there any malfunction?</li> </ul>	Yes	<p>Replace the fuel pump unit, then go to Step 11.</p> <p>(See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF]</b>.)</p>
		No	Go to the next step.
10	<p><b>INSPECT LONG TERM FUEL TRIM</b></p> <ul style="list-style-type: none"> <li>• Connect the M-MDS to the DLC-2.</li> </ul>	Yes	<p>Inspect the purge valve.</p> <p>(See <b>PURGE SOLENOID VALVE INSPECTION</b></p>

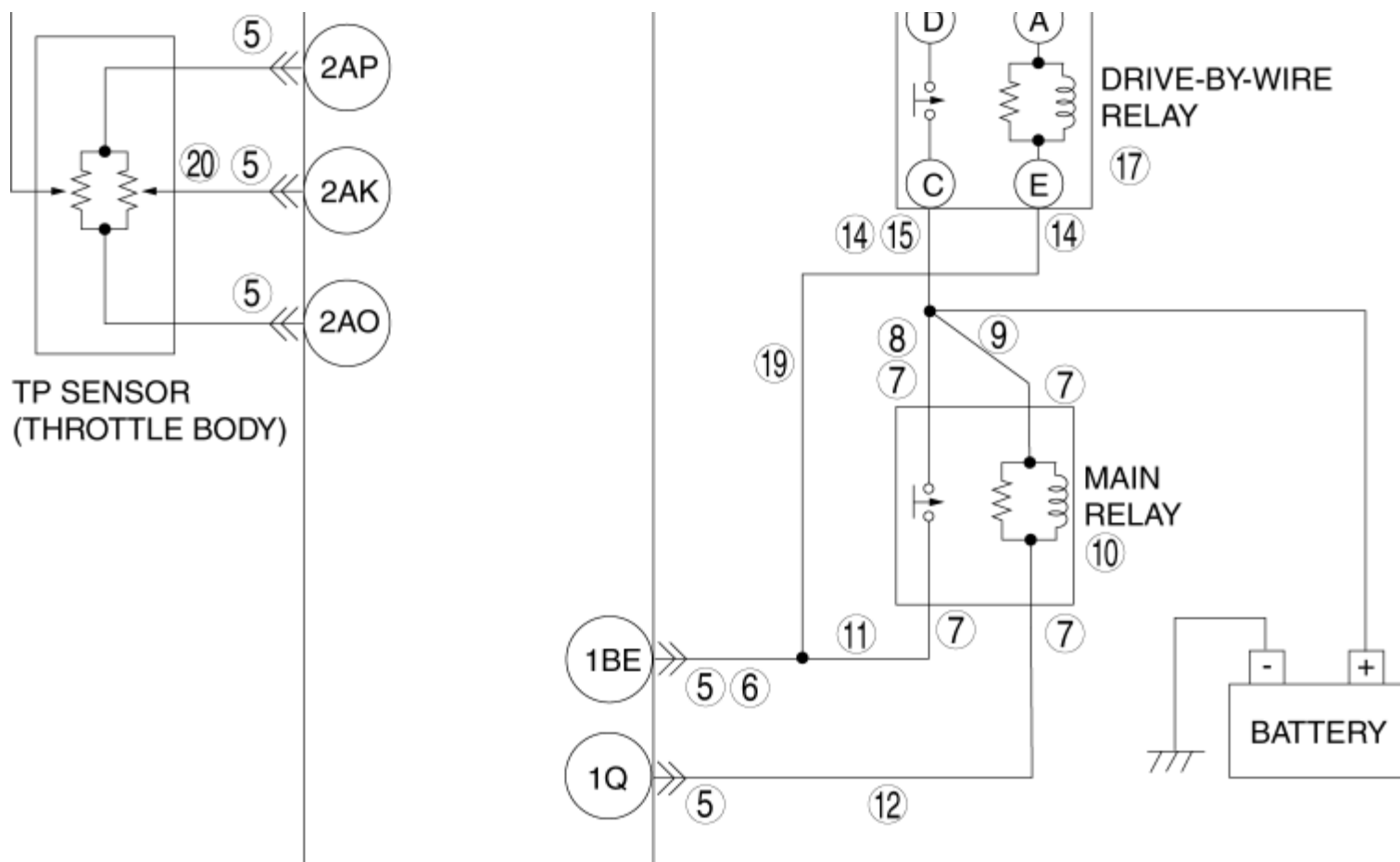
	<ul style="list-style-type: none"> <li>• Access LONGFT1 PID.</li> <li>• Compare the LONGFT1 PID with recorded FREEZE FRAME DATA at Step 1.</li> <li>• Is the LONGFT1 PID above FREEZE FRAME DATA?</li> </ul>	<p>[LF].)</p> <ul style="list-style-type: none"> <li>• If there is any malfunction, replace the purge valve.</li> </ul> <p>(See <b>INTAKE-AIR SYSTEM VACUUM HOSE ROUTING DIAGRAM [LF].</b>)</p> <p>Then go to Step 11.</p>
		No Go to the next step.
11	<b>VERIFY TROUBLESHOOTING OF DTC P2097 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Perform the PCM Adaptive Memory Produce Drive Mode.</li> </ul> <p>(See <b>OBD-II DRIVE MODE [LF].</b>)</p> <ul style="list-style-type: none"> <li>• Is the PENDING CODE for this DTC present?</li> </ul>	<p>Yes Replace the PCM, then go to the next step.</p> <p>(See <b>PCM REMOVAL/INSTALLATION [LF].</b>)</p>
		No Go to the next step.
12	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform the "AFTER REPAIR PROCEDURE".</li> </ul> <p>(See <b>AFTER REPAIR PROCEDURE [LF].</b>)</p> <ul style="list-style-type: none"> <li>• Are any DTC present?</li> </ul>	<p>Yes Go to the applicable DTC inspection.</p> <p>(See <b>DTC TABLE [LF].</b>)</p>
		No Troubleshooting completed.

2008 - MX-5 - Engine

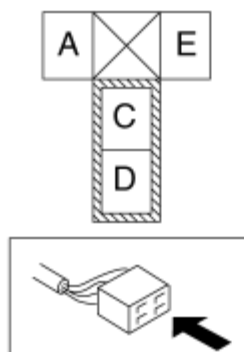
DTC P2101 [LF]

DTC P2101	Throttle actuator circuit range/performance
DETECTION CONDITION	<div><ul style="list-style-type: none"><li>The PCM monitors the input voltage from the drive-by-wire relay when the PCM turns the drive-by-wire relay on. If the input voltage is <b>less than 5.0 V</b>, the PCM determines that the drive-by-wire relay control circuit voltage is low.</li><li>The PCM monitors the input voltage from the drive-by-wire relay when the PCM turns the drive-by-wire relay off. If the input voltage is <b>more than 5.0 V</b> the PCM determines that the drive-by-wire relay control circuit voltage is high.</li></ul><div>Diagnostic support note</div><ul style="list-style-type: none"><li>This is a continuous monitor. (CCM)</li><li>The MIL illuminates if the PCM detects the above malfunction conditions during the first drive cycle.</li><li>PENDING CODE is available if the PCM detects the above malfunction conditions.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul></div>
POSSIBLE CAUSE	<div><ul style="list-style-type: none"><li>Drive-by-wire relay and related circuit malfunction</li><li>Main relay and related circuit malfunction</li><li>Throttle position sensor No.1 and related circuit malfunction</li><li>Throttle position sensor No.2 and related circuit malfunction</li><li>PCM malfunction</li></ul></div>

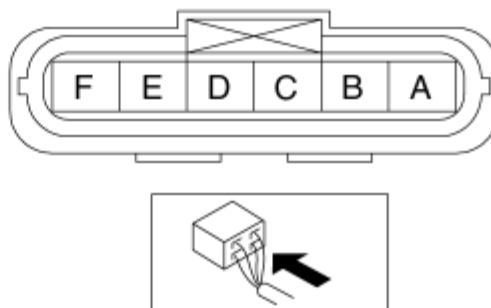




DRIVE-BY-WIRE RELAY



THROTTLE BODY WIRING HARNESS-SIDE CONNECTOR



PCM WIRING HARNESS-SIDE CONNECTOR

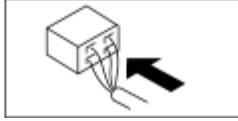
1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B



2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>VERIFY RELATED PENDING AND STORED DTCs</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off, then to the ON position (Engine off).</li> <li>Verify the pending and stored DTCs using the M-MDS.</li> <li>Is any DTC present?</li> </ul>	Yes Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [LF]</a> ).
		No Go to the next step.
4	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> <ul style="list-style-type: none"> <li>Is DTC P2101 on FREEZE FRAME DATA?</li> </ul>	Yes Go to the next step.
		No Go to the troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the PCM connector.</li> <li>Inspect for poor connection (such as damaged, pulled out terminals, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace the terminal, then go to Step 22.
		No Go to the next step.

6	<b>INSPECT MAIN RELAY OUTPUT VOLTAGE</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Connect the PCM connector.</li> <li>• Turn the ignition switch to the ON position (Engine off).</li> <li>• Measure the voltage between PCM terminal 1BE and body ground.</li> <li>• Is the voltage <b>B+</b>?</li> </ul>	Yes	Go to Step 13.
		No	Go to the next step.
7	<b>INSPECT MAIN RELAY CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the main relay.</li> <li>• Inspect for poor connection (such as damaged, pulled out terminals, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 22.
		No	Go to the next step.
8	<b>INSPECT POWER SUPPLY OF MAIN RELAY</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position (Engine off).</li> <li>• Measure the voltage between main relay and body ground.</li> <li>• Is the voltage <b>B+</b>?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to Step 22.
9	<b>INSPECT POWER SUPPLY FOR CONTROL CIRCUIT OF MAIN RELAY</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position (Engine off).</li> <li>• Measure the voltage between main relay and body ground.</li> <li>• Is the voltage <b>B+</b>?</li> </ul>	Yes	Go to the next step.
		No	Go to Step 22.
10	<b>INSPECT MAIN RELAY</b> <ul style="list-style-type: none"> <li>• Inspect the main relay. (See <a href="#">RELAY INSPECTION</a>.)</li> <li>• Is the main relay normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the main relay, then go to Step 22.
11	<b>INSPECT POWER CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the main relay and the PCM connector.</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to Step 22.

	<ul style="list-style-type: none"> <li>Inspect for continuity between main relay and PCM terminal 1BE (wiring harness-side).</li> <li>Is there continuity?</li> </ul>		
12	<b>INSPECT CONTROL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for continuity between main relay and PCM terminal 1Q (wiring harness-side).</li> <li>Is there continuity?</li> </ul>	Yes	Go to Step 22.
		No	Repair or replace the wiring harness for an open circuit, then go to Step 22.
13	<b>INSPECT DRIVE-BY-WIRE RELAY OUTPUT VOLTAGE</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Measure the voltage between PCM terminal 1BF (wiring harness-side) and body ground.</li> <li>Is the voltage <b>B+</b>?</li> </ul>	Yes	Go to Step 20.
		No	Go to the next step.
14	<b>INSPECT DRIVE-BY-WIRE RELAY CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the drive-by-wire relay.</li> <li>Inspect the drive-by-wire relay connector (wiring harness-side) for poor connection (such as damaged, pulled out terminals, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 22.
		No	Go to the next step.
15	<b>INSPECT POWER SUPPLY OF DRIVE-BY-WIRE RELAY</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Measure the voltage between drive-by-wire relay terminal C (wiring harness-side) and body ground.</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to Step 22.
16	<b>INSPECT POWER SUPPLY FOR CONTROL CIRCUIT OF DRIVE-BY-WIRE RELAY</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Measure the voltage between the drive-by-wire relay terminal A (wiring harness-side) and body</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit between drive-by-wire relay terminal A and main relay terminal C, then go to Step 22.

	<p>ground.</p> <ul style="list-style-type: none"> <li>Is the voltage <b>B+</b>?</li> </ul>		
17	<p><b>INSPECT DRIVE-BY-WIRE RELAY</b></p> <ul style="list-style-type: none"> <li>Inspect the drive-by-wire relay.</li> <li>(See <b>RELAY INSPECTION</b>.)</li> <li>Is the drive-by-wire relay normal?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Replace the drive-by-wire relay, then go to Step 22.</p>	
18	<p><b>INSPECT POWER CIRCUIT FOR OPEN CIRCUIT</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Inspect for continuity between drive-by-wire relay terminal D (wiring harness-side) and PCM terminal 1BF (wiring harness-side).</li> <li>Is there continuity?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Repair or replace the wiring harness for an open circuit, then go to Step 22.</p>	
19	<p><b>INSPECT CONTROL CIRCUIT FOR OPEN CIRCUIT</b></p> <ul style="list-style-type: none"> <li>Inspect for continuity between drive-by-wire relay E (wiring harness-side) and PCM terminal 1BE (wiring harness-side).</li> </ul>	<p>Yes Go to the next step.</p> <p>No Repair or replace the wiring harness for an open circuit, then go to Step 22.</p>	
20	<p><b>INSPECT THROTTLE POSITION SENSOR NO.1 OUTPUT VOLTAGE</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Connect the PCM connector.</li> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Inspect the voltage between PCM terminal 2AK and body ground.</li> <li>Is the voltage <b>0.40—0.60 V</b>?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Inspect throttle position sensor No.1 and the related circuits and terminals.</p> <p>(See <b>THROTTLE POSITION (TP) SENSOR INSPECTION [LF]</b>.)</p> <p>Repair or replace if necessary, then go to Step 22.</p>	
21	<p><b>INSPECT THROTTLE POSITION SENSOR NO.2 OUTPUT VOLTAGE</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Inspect the voltage between PCM terminal 2AL and body ground.</li> <li>Is the voltage <b>4.40—4.60 V</b>?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Check throttle position sensor No.2 and the related circuits and terminals.</p> <p>(See <b>THROTTLE POSITION (TP) SENSOR INSPECTION [LF]</b>.)</p> <p>Repair or replace if necessary, then go to the next step.</p>	
22	<p><b>VERIFY TROUBLESHOOTING OF DTC P2101 COMPLETED</b></p>	<p>Yes Replace the PCM, then go to the next step.</p>	<p><b>PCM REMOVAL/INSTALLATION [LF]</b></p>

	<p>Make sure to reconnect all disconnected connectors.</p> <ul style="list-style-type: none"><li>• Turn the ignition switch to the ON position (Engine off).</li><li>• Clear the DTC from the PCM memory using the M-MDS.</li><li>• Start the engine and idle it.</li><li>• Turn the ignition switch off, then to the ON position (Engine off).</li><li>• Is the same DTC present?</li></ul>		(See .)
		No	Go to the next step.
23	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"><li>• Perform the "AFTER REPAIR PROCEDURE".</li></ul> <p>(See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</p> <ul style="list-style-type: none"><li>• Are any DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.

## 2008 - MX-5 - Engine

### DTC P2107 [LF]

DTC P2107	Throttle actuator control module processor error
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>Throttle actuator control module internal processor error</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>PENDING CODE is available if the PCM detects the above malfunction conditions.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Throttle actuator control module internal processor malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b>	Yes Perform repair or diagnosis according to the available repair information.
	<ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	No Go to the next step.
3	<b>VERIFY TROUBLESHOOTING OF DTC P2107 COMPLETED</b>	Yes Replace the PCM, then go to the next step.

	<ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Clear the DTC from the PCM memory using the M-MDS.</li><li>• Start the engine.</li><li>• Is the same DTC present?</li></ul>		(See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
4	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "AFTER REPAIR PROCEDURE".</li></ul> (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a> .)	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .)
		No	DTC troubleshooting completed.
	<ul style="list-style-type: none"><li>• Is any DTC present?</li></ul>		

## 2008 - MX-5 - Engine

### DTC P2108 [LF]

DTC P2108	Throttle actuator control module performance error
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM internal malfunction.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>PENDING CODE is available if the PCM detects the above malfunction conditions.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>PCM internal malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b>	Yes Perform repair or diagnosis according to the available repair information.
	<ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	No Go to the next step.
3	<b>VERIFY TROUBLESHOOTING OF DTC P2108 COMPLETED</b>	Yes Replace the PCM, then go to the next step.



	<ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Clear the DTC from the PCM memory using the M-MDS.</li><li>• Start the engine.</li><li>• Is the same DTC present?</li></ul>		(See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
4	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "AFTER REPAIR PROCEDURE".</li></ul> (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a> .)	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .)
		No	DTC troubleshooting completed.
	<ul style="list-style-type: none"><li>• Is any DTC present?</li></ul>		

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### DTC P2119 [LF]

DTC P2119	Throttle actuator control throttle body range/performance problem
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM compares the actual TP with initial setting TP when the ignition switch is off. If the difference is less than the specification, the PCM determines that there is a throttle actuator control circuit range/performance problem.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>The MIL illuminates if the PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li> <li>PENDING CODE is available if the PCM detects the above malfunction conditions during the first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Throttle actuator malfunction</li> <li>Throttle valve malfunction</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b>	Yes Perform repair or diagnosis according to the available repair information.
	<ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information</li> </ul>	<ul style="list-style-type: none"> <li>If the vehicle is not</li> </ul>

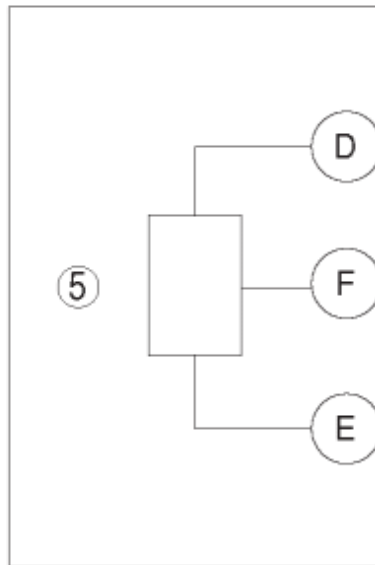
	availability. <ul style="list-style-type: none"> <li>Is any related repair information available?</li> </ul>		repaired, go to the next step.
		No	Go to the next step.
3	<b>INSPECT THROTTLE ACTUATOR</b> <ul style="list-style-type: none"> <li>Inspect the throttle actuator.</li> <li>Is there any malfunction?</li> </ul>	Yes	Replace the throttle body, then go to Step 5.  (See <a href="#">INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
4	<b>INSPECT THROTTLE VALVE</b> <ul style="list-style-type: none"> <li>Inspect the throttle valve.</li> <li>Is there any malfunction?</li> </ul>	Yes	Replace the throttle body, then go to the next step.  (See <a href="#">INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
5	<b>VERIFY TROUBLESHOOTING OF DTC P2119 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Turn the ignition switch to the ON position (Engine off), then off.</li> <li>Is the PENDING CODE for this DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step.  (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
6	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the "AFTER REPAIR PROCEDURE".             (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to the applicable DTC inspection.  (See <a href="#">DTC TABLE [LF]</a> .)
		No	DTC troubleshooting completed.

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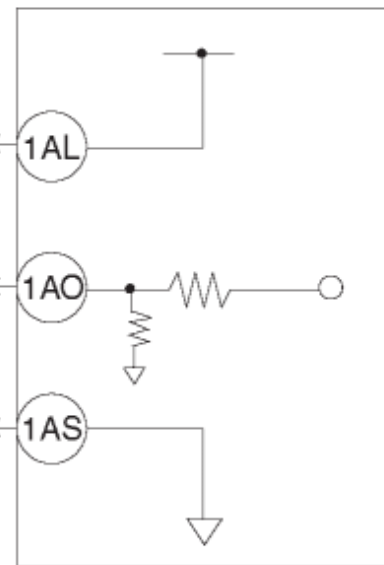
DTC P2122 [LF]

DTC P2122	APP sensor No.1 circuit low input
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors the input voltage from APP sensor No.1 when the engine is running. If the input voltage is <b>less than 0.35 V</b>, the PCM determines that the APP sensor No.1 circuit input voltage is low.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (CCM).</li><li>• The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle.</li><li>• PENDING CODE is available if the PCM detects the above malfunction conditions.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• APP sensor No.1 malfunction</li><li>• Connector or terminal malfunction</li><li>• Open circuit in wiring harness between APP sensor terminal D and PCM terminal 1AL</li><li>• Short to ground in wiring harness between APP sensor terminal D and PCM terminal 1AL</li><li>• Open circuit in wiring harness between APP sensor terminal F and PCM terminal 1AO</li><li>• Short to ground in wiring harness between APP sensor terminal F and PCM terminal 1AO</li><li>• PCM malfunction</li></ul>

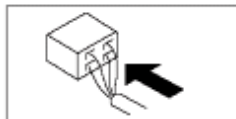
# APP SENSOR NO.1 (APP SENSOR)



# PCM

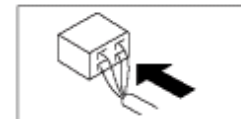


## APP SENSOR WIRING HARNESS-SIDE CONNECTOR



## PCM WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step. No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>

		No	Go to the next step.
3	<b>INSPECT APP SENSOR CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the APP sensor connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	<b>INSPECT APP SENSOR NO.1 CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Inspect for continuity between the following terminals and body ground: <ul style="list-style-type: none"> <li>▪ APP sensor terminal D (wiring harness-side) and body ground</li> <li>▪ APP sensor terminal F (wiring harness-side) and body ground</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 8.
		No	Go to the next step.
5	<b>INSPECT APP SENSOR NO.1</b> <ul style="list-style-type: none"> <li>• Inspect APP sensor No.1.</li> </ul> <p>(See <b>ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [LF].</b>)</p> <ul style="list-style-type: none"> <li>• Is there any malfunction?</li> </ul>	Yes	Replace the APP sensor, then go to Step 8.
			(See <b>ACCELERATOR PEDAL REMOVAL/INSTALLATION [LF].</b> )
		No	Go to the next step.
6	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the PCM connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	<b>INSPECT APP SENSOR NO.1 CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Inspect for continuity between the following terminals: <ul style="list-style-type: none"> <li>▪ APP sensor terminal D (wiring harness-side)</li> </ul> </li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible an open circuit, then go to the next step.

	<p>and PCM terminal 1AL (wiring harness-side)</p> <ul style="list-style-type: none"> <li>▪ APP sensor terminal F (wiring harness-side) and PCM terminal 1AO (wiring harness-side)</li> </ul> <ul style="list-style-type: none"> <li>• Is there continuity?</li> </ul>		
8	<p><b>VERIFY TROUBLESHOOTING OF DTC P2122 COMPLETED</b></p> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Start the engine.</li> <li>• Is the same DTC present?</li> </ul>	Yes	<p>Replace the PCM, then go to the next step.</p> <p>(See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a>.)</p>
		No	Go to the next step.
9	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"> <li>• Perform the "AFTER REPAIR PROCEDURE".</li> </ul> <p>(See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</p> <ul style="list-style-type: none"> <li>• Is any DTC present?</li> </ul>	Yes	<p>Go to the applicable DTC inspection.</p> <p>(See <a href="#">DTC TABLE [LF]</a>.)</p>
		No	DTC troubleshooting completed.

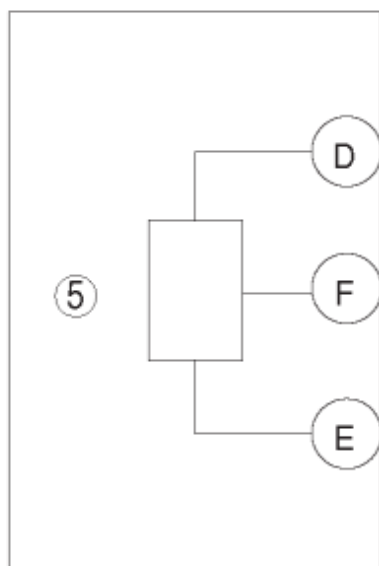
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DTC P2123 [LF]

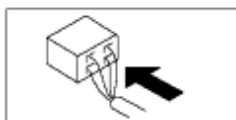
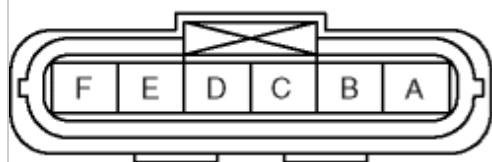
DTC P2123	APP sensor No.1 circuit high input
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors the input voltage from APP sensor No.1 when the engine is running. If the input voltage is <b>above 4.8 V</b>, the PCM determines that the APP sensor No.1 circuit input voltage is high.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (CCM).</li><li>• The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle.</li><li>• PENDING CODE is available if the PCM detects the above malfunction conditions.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTCs is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• APP sensor No.1 malfunction</li><li>• Connector or terminal malfunction</li><li>• Short to power supply in wiring harness between APP sensor terminal F and PCM terminal 1AO</li><li>• Open circuit in wiring harness between APP sensor terminal E and PCM terminal 1AS</li><li>• PCM malfunction</li></ul>



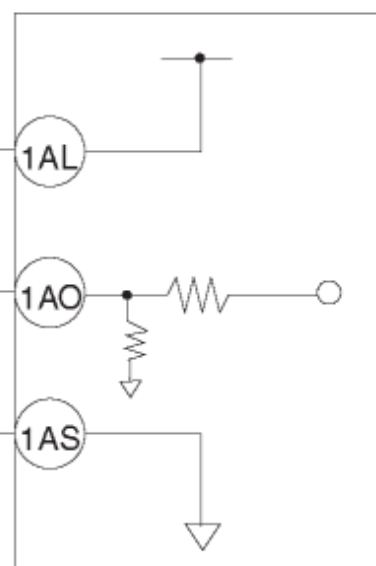
## APP SENSOR NO.1 (APP SENSOR)



APP SENSOR  
WIRING HARNESS-SIDE  
CONNECTOR

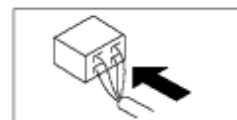


## PCM



PCM  
WIRING HARNESS-SIDE  
CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.  No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>

		No	Go to the next step.
3	<b>INSPECT APP SENSOR CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the APP sensor connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	<b>INSPECT APP SENSOR NO.1 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position (Engine off).</li> <li>• Measure the voltage between APP sensor terminal F (wiring harness-side) and body ground.</li> <li>• Is the voltage <b>B+</b>?</li> </ul>	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 8.
		No	Go to the next step.
5	<b>INSPECT APP SENSOR NO.1</b> <ul style="list-style-type: none"> <li>• Inspect APP sensor No.1.</li> </ul> <p>(See <b>ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>• Is there any malfunction?</li> </ul>	Yes	Replace the APP sensor, then go to Step 8.
			(See <b>ACCELERATOR PEDAL REMOVAL/INSTALLATION [LF]</b> .)
		No	Go to the next step.
6	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the PCM connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	<b>INSPECT APP SENSOR NO.1 GROUND CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Inspect for continuity between APP sensor terminal E (wiring harness-side) and PCM terminal 1AS (wiring harness-side).</li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible an open circuit, then go to the next step.
8	<b>VERIFY TROUBLESHOOTING OF DTC P2123 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> </ul>	Yes	Replace the PCM, then go to the next step.
			(See <b>PCM REMOVAL/INSTALLATION</b> )

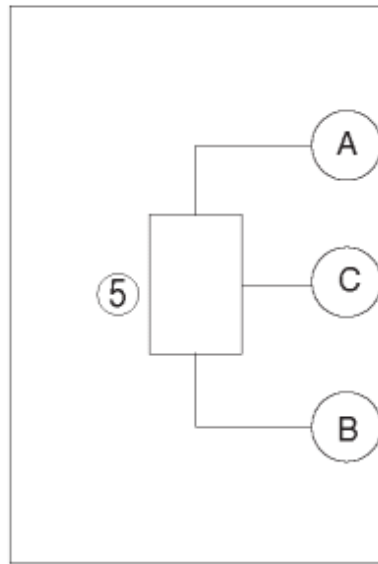
	<ul style="list-style-type: none"><li>• Clear the DTC from the PCM memory using the M-MDS.</li><li>• Start the engine.</li><li>• Is the same DTC present?</li></ul>		[LF].)
		No	Go to the next step.
9	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the “AFTER REPAIR PROCEDURE”. (See <b>AFTER REPAIR PROCEDURE [LF].</b>)</li><li>• Is any DTC present?</li></ul>	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [LF].</b> )
		No	DTC troubleshooting completed.

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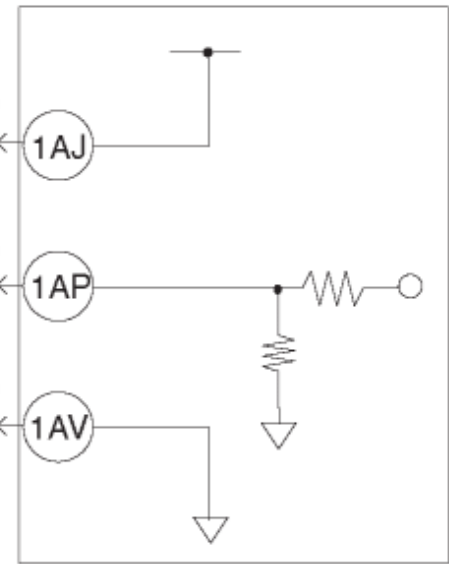
DTC P2127 [LF]

DTC P2127	APP sensor No.2 circuit low input
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors the input voltage from APP sensor No.2 when the engine is running. If the input voltage is <b>less than 0.35 V</b>, the PCM determines that the APP sensor No.2 circuit has a malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (CCM).</li><li>• The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle.</li><li>• PENDING CODE is available if the PCM detects the above malfunction conditions.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• APP sensor No.2 malfunction</li><li>• Connector or terminal malfunction</li><li>• Open circuit in wiring harness between APP sensor terminal A and PCM terminal 1AJ</li><li>• Short to ground in wiring harness between APP sensor terminal A and terminal 1AJ</li><li>• Open circuit in wiring harness between APP sensor terminal C and PCM terminal 1AP</li><li>• Short to ground in wiring harness between APP sensor terminal C and PCM terminal 1AP</li><li>• PCM malfunction</li></ul>

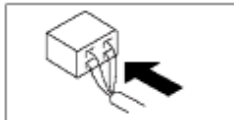
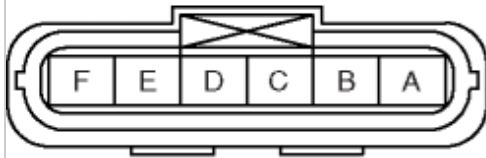
## APP SENSOR NO.2 (APP SENSOR)



## PCM

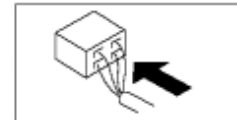


## APP SENSOR WIRING HARNESS-SIDE CONNECTOR



## PCM WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step. No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> No Go to the next step.

3	<b>INSPECT APP SENSOR CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the APP sensor connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	<b>INSPECT APP SENSOR NO.2 CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Inspect for continuity between the following terminals and body ground: <ul style="list-style-type: none"> <li>▪ APP sensor terminal A (wiring harness-side) and body ground</li> <li>▪ APP sensor terminal C (wiring harness-side) and body ground</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness for a possible short to ground, then go to Step 8.
		No	Go to the next step.
5	<b>INSPECT APP SENSOR NO.2</b> <ul style="list-style-type: none"> <li>• Inspect APP sensor No.2.</li> </ul> <p>(See <b>ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>• Is there any malfunction?</li> </ul>	Yes	Replace the APP sensor, then go to Step 8.
		No	Go to the next step.
6	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the PCM connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	<b>INSPECT APP SENSOR NO.2 CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Inspect for continuity between the following terminals: <ul style="list-style-type: none"> <li>▪ APP sensor terminal A (wiring harness-side) and PCM terminal 1AJ (wiring harness-side)</li> </ul> </li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible an open circuit, then go to the next step.

	<ul style="list-style-type: none"> <li>▪ APP sensor terminal C (wiring harness-side) and PCM terminal 1AP (wiring harness-side)</li> </ul> <ul style="list-style-type: none"> <li>• Is there continuity?</li> </ul>		
8	<b>VERIFY TROUBLESHOOTING OF DTC P2127 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Start the engine.</li> <li>• Is the same DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step.  (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
9	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform the "AFTER REPAIR PROCEDURE".</li> </ul> (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a> .) <ul style="list-style-type: none"> <li>• Is any DTC present?</li> </ul>	Yes	Go to the applicable DTC inspection.  (See <a href="#">DTC TABLE [LF]</a> .)
		No	Troubleshooting completed.

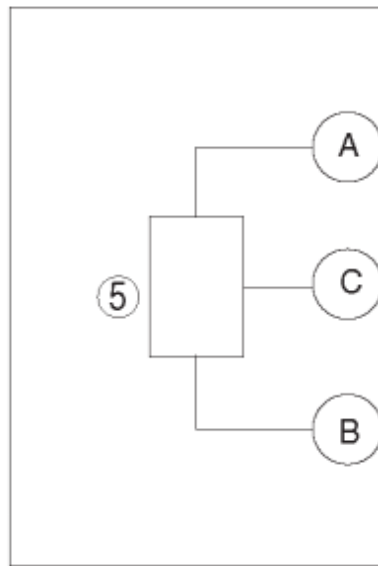
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DTC P2128 [LF]

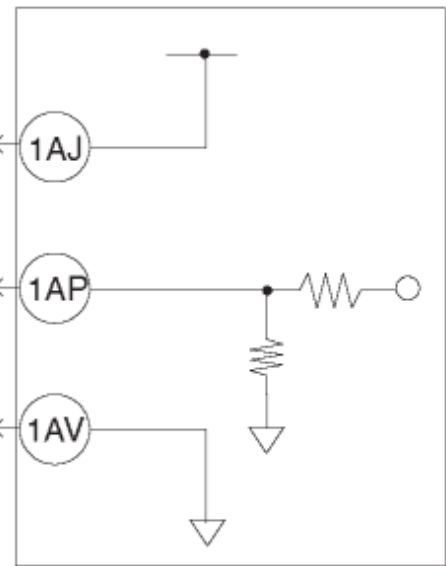
DTC P2128	APP sensor No.2 circuit high input
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors the input voltage from APP sensor No.2 when the engine is running. If the input voltage is <b>more than 4.8 V</b>, the PCM determines that the APP sensor No.2 circuit has a malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (CCM).</li><li>• The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle.</li><li>• PENDING CODE is available if the PCM detects the above malfunction conditions.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• APP sensor No.2 malfunction</li><li>• Connector or terminal malfunction</li><li>• Open circuit in wiring harness between APP sensor terminal B and PCM terminal 1AV</li><li>• Short to power supply in wiring harness between APP sensor terminal B and PCM terminal 1AV</li><li>• Short to power supply in wiring harness between APP sensor terminal C and PCM terminal 1AP</li><li>• PCM malfunction</li></ul>



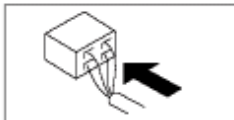
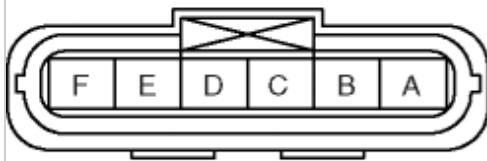
## APP SENSOR NO.2 (APP SENSOR)



## PCM

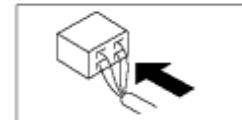


## APP SENSOR WIRING HARNESS-SIDE CONNECTOR



## PCM WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information.
		<ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>

		No	Go to the next step.
3	<b>INSPECT APP SENSOR CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the APP sensor connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
4	<b>INSPECT APP SENSOR NO.2 SIGNAL CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position (Engine off).</li> <li>• Measure the voltage between the following circuits: <ul style="list-style-type: none"> <li>▪ APP sensor terminal B (wiring harness-side) and PCM terminal 1AV</li> <li>▪ APP sensor terminal C (wiring harness-side) and PCM terminal 1AP</li> </ul> </li> <li>• Is the voltage <b>B+</b>?</li> </ul>	Yes	Repair or replace the wiring harness for a possible short to power supply, then go to Step 8.
		No	Go to the next step.
5	<b>INSPECT APP SENSOR NO.2</b> <ul style="list-style-type: none"> <li>• Inspect APP sensor No.2. (See <b>ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [LF]</b>.)</li> <li>• Is there any malfunction?</li> </ul>	Yes	Replace the APP sensor, then go to Step 8.  (See <b>ACCELERATOR PEDAL REMOVAL/INSTALLATION [LF]</b> .)
		No	Go to the next step.
6	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the PCM connector.</li> <li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 8.
		No	Go to the next step.
7	<b>INSPECT APP SENSOR NO.2 GROUND CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Inspect for continuity between APP sensor terminal B (wiring harness-side) and PCM terminal 1AV (wiring harness-side).</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for a possible an open circuit, then go to the next step.

	<ul style="list-style-type: none"> <li>• Is there continuity?</li> </ul>		
8	<b>VERIFY TROUBLESHOOTING OF DTC P2128 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Start the engine.</li> <li>• Is the same DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step.  (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
9	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform the "AFTER REPAIR PROCEDURE". (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</li> <li>• Is any DTC present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .)
		No	DTC troubleshooting completed.

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## 2008 - MX-5 - Engine

### DTC P2135 [LF]

DTC P2135	TP sensor No.1/No.2 voltage correlation problem
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM compares the input voltage from TP sensor No.1 with the input voltage from TP sensor No.2 when the engine is running. If the difference is more than the specification, the PCM determines that there is a TP sensor No.1/No.2 voltage correlation problem.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>PENDING CODE is available if the PCM detects the above malfunction conditions.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>TP sensor No.1 malfunction</li> <li>TP sensor No.2 malfunction</li> <li>Connector or terminal malfunction</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b>	Yes Perform repair or diagnosis according to the available repair information.
	<ul style="list-style-type: none"> <li>Verify related Service Bulletins</li> </ul>	<ul style="list-style-type: none"> <li>If the vehicle is not</li> </ul>

	<p>and/or on-line repair information availability.</p> <ul style="list-style-type: none"> <li>Is any related repair information available?</li> </ul>		<p>repaired, go to the next step.</p>
		No	Go to the next step.
3	<p><b>INSPECT THROTTLE BODY CONNECTOR FOR POOR CONNECTION</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the throttle body connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 6.
		No	Go to the next step.
4	<p><b>INSPECT TP SENSOR</b></p> <ul style="list-style-type: none"> <li>Inspect the TP sensor.</li> </ul> <p>(See <b>THROTTLE POSITION (TP) SENSOR INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>Is there any malfunction?</li> </ul>	Yes	<p>Replace the throttle body, then go to Step 6.</p> <p>(See <b>INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [LF]</b>.)</p>
		No	Go to the next step.
5	<p><b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the PCM connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
6	<p><b>VERIFY TROUBLESHOOTING OF DTC P2135 COMPLETED</b></p> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Start the engine.</li> <li>Is the same DTC present?</li> </ul>	Yes	<p>Replace the PCM, then go to the next step.</p> <p>(See <b>PCM REMOVAL/INSTALLATION [LF]</b>.)</p>
		No	Go to the next step.
7	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"> <li>Perform the "AFTER REPAIR PROCEDURE".</li> </ul> <p>(See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</p>	Yes	<p>Go to the applicable DTC inspection.</p> <p>(See <b>DTC TABLE [LF]</b>.)</p>
		No	DTC troubleshooting completed.

- |  |   |  |  |
|--|---|--|--|
|  | <ul style="list-style-type: none"><li>• Is any DTC present?</li></ul> |  |  |
|--|---|--|--|

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## 2008 - MX-5 - Engine

### DTC P2138 [LF]

DTC P2138	APP sensor No.1/No.2 voltage correlation problem
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM compares the input voltage from APP sensor No.1 with the input voltage from APP sensor No.2 when the engine is running. If the difference is more than the specification, the PCM determines that there is an APP sensor No.1/No.2 angle correlation problem.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>PENDING CODE is available if the PCM detects the above malfunction conditions.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>APP sensor No.1 malfunction</li> <li>APP sensor No.2 malfunction</li> <li>Connector or terminal malfunction</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b>	Yes Perform repair or diagnosis according to the available repair information.
	<ul style="list-style-type: none"> <li>Verify related Service Bulletins</li> </ul>	<ul style="list-style-type: none"> <li>If the vehicle is not</li> </ul>

	<p>and/or on-line repair information availability.</p> <ul style="list-style-type: none"> <li>Is any related repair information available?</li> </ul>		<p>repaired, go to the next step.</p>
		No	Go to the next step.
3	<p><b>INSPECT APP SENSOR CONNECTOR FOR POOR CONNECTION</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the APP sensor connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 6.
		No	Go to the next step.
4	<p><b>INSPECT APP SENSOR</b></p> <ul style="list-style-type: none"> <li>Inspect the APP sensor.</li> </ul> <p>(See <a href="#">ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [LF]</a>.)</p> <ul style="list-style-type: none"> <li>Is there any malfunction?</li> </ul>	Yes	<p>Replace the APP sensor, then go to Step 6.</p> <p>(See <a href="#">ACCELERATOR PEDAL REMOVAL/INSTALLATION [LF]</a>.)</p>
		No	Go to the next step.
5	<p><b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the PCM connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to the next step.
		No	Go to the next step.
6	<p><b>VERIFY TROUBLESHOOTING OF DTC P2138 COMPLETED</b></p> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Start the engine.</li> <li>Is the same DTC present?</li> </ul>	Yes	<p>Replace the PCM, then go to the next step.</p> <p>(See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a>.)</p>
		No	Go to the next step.
7	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"> <li>Perform the "AFTER REPAIR PROCEDURE".</li> </ul> <p>(See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</p> <ul style="list-style-type: none"> <li>Is any DTC present?</li> </ul>	Yes	<p>Go to the applicable DTC inspection.</p> <p>(See <a href="#">DTC TABLE [LF]</a>.)</p>
		No	DTC troubleshooting completed.





## 2008 - MX-5 - Engine

### DTC P2177 [LF]

DTC P2177	Fuel system too lean at off idle
DETECTION CONDITION	<ul style="list-style-type: none"><li>PCM monitors short term fuel trim (SHRTFT), long term fuel trim (LONGFT) during closed loop fuel control at off-idle. If the LONGFT and the sum total of these fuel trims exceed preprogrammed criteria. PCM determines that fuel system is too lean at off-idle.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>This is a continuous monitor. (Fuel system)</li><li>The MIL illuminates if the PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>PENDING CODE is available if the PCM detects the above malfunction conditions during the first drive cycle.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Misfire</li><li>Front HO2S deterioration</li><li>Front HO2S heater malfunction</li><li>MAF sensor malfunction</li><li>Pressure regulator (built-in fuel injection pump) malfunction</li><li>Fuel pump malfunction</li><li>Fuel filter clogged or restricted</li><li>Fuel leakage on fuel line from fuel delivery pipe and fuel pump</li><li>Leakage exhaust system</li><li>Purge solenoid valve improper operation</li><li>Purge solenoid valve malfunction (stuck open)</li><li>Purge solenoid hoses improper connection</li><li>Air suction in intake air system</li></ul>

- Insufficient engine compression
- Variable valve timing control system improper operation
- PCM malfunction

## Diagnostic procedure

STEP	INSPECTION		ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b> <ul style="list-style-type: none"> <li>• Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Fuel system related) been recorded?</li> </ul>	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>• Verify related Service Bulletins and/or on-line repair information availability.</li> <li>• Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>• If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<b>VERIFY RELATED PENDING CODE OR STORED DTCS</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off, then to the ON position (Engine off).</li> <li>• Verify related pending code or stored DTCS.</li> <li>• Is other DTC present?</li> </ul>	Yes	If misfire DTC is present, go to Step 8.  If other DTC is present, go to the applicable DTC inspection.  (See <a href="#">DTC TABLE [LF]</a> .)
		No	If driveability concern is present, go to Step 8.  If not, go to the next step.
4	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> <ul style="list-style-type: none"> <li>• Is DTC P2177 on FREEZE FRAME DATA?</li> </ul>	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	<b>VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION SWITCH TO THE ON POSITION/IDLE)</b> <ul style="list-style-type: none"> <li>• Access APP1, APP2, ECT, MAF, TP and VSS PIDs using M-MDS.</li> <li>• Is there any signal that is far out of specification when the ignition switch</li> </ul>	Yes	Inspect the sensor and excessive resistance in related wiring harnesses.  Repair if necessary.  Then go to Step 17.

	is at the ON position and the engine runs?	No	Go to the next step.
6	<b>VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION</b> <ul style="list-style-type: none"> <li>Inspect the same PIDs as Step 5 while simulating FREEZE FRAME DATA condition.</li> <li>Is there any signal which causes drastic changes?</li> </ul>	Yes	Inspect the sensor and related wiring harnesses repair or replace it.  Then go to Step 17.
		No	Go to the next step.
7	<b>INSPECT FRONT HO2S</b> <ul style="list-style-type: none"> <li>Inspect the front HO2S                 (See <b>FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF].</b>)</li> <li>Is HO2S normal?</li> </ul>	Yes	Go to the next step.
		No	Visually inspect for any gas leakage between the exhaust manifold and the front HO2S.  Then go to Step 17.
8	<b>VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR</b> <ul style="list-style-type: none"> <li>Connect the M-MDS to the DLC-2.</li> <li>Start the engine.</li> <li>Access the MAF PID.</li> <li>Verify that the MAF PID changes quickly according to engine speed.</li> <li>Is the PID normal?</li> </ul>	Yes	Go to the next step.
		No	Replace MAF/IAT sensor, then go to Step 17.  (See <b>MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION [LF].</b> )
9	<b>INSPECT FOR EXCESSIVE AIR SUCTION OF INTAKE AIR SYSTEM</b> <ul style="list-style-type: none"> <li>Visually inspect for loosen, cracks or damages hoses on intake air system.</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace source of air suction, then go to Step 17.
		No	Go to the next step.
10	<b>INSPECT PURGE SOLENOID OPERATION</b> <ul style="list-style-type: none"> <li>Perform Purge Control System Inspection.                 (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF].</b>)</li> <li>Does the purge control system work properly?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to inspection result, then go to Step 17.
11	<b>INSPECT FUEL LINE PRESSURE</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Inspect the fuel line pressure.</li> </ul>	Yes	Go to Step 12.
		No	If the fuel pressure is too high, replace fuel pump unit, then go to Step 17.

	<p>(See <b>FUEL LINE PRESSURE INSPECTION [LF].</b>)</p> <ul style="list-style-type: none"> <li>Is the fuel line pressure normal?</li> </ul>		If the fuel line pressure is low, go to the next step.
12	<p><b>INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE</b></p> <ul style="list-style-type: none"> <li>Visually inspect fuel line for any leakage.</li> <li>Is fuel leakage found?</li> </ul>	Yes	Replace suspected fuel line, then go to Step 17.
		No	<p>Inspect for foreign materials or stain inside fuel filter (low-pressure).</p> <p>If for foreign materials or stain inside fuel filter (low-pressure), clean of fuel tank and filter.</p> <p>Then go to Step 17.</p>
13	<p><b>INSPECT IGNITION SYSTEM</b></p> <ul style="list-style-type: none"> <li>Perform spark test.</li> </ul> <p>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF].</b>)</p> <ul style="list-style-type: none"> <li>Is strong blue spark visible at each cylinder?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to spark test result, then go to Step 17.
14	<p><b>INSPECT ENGINE COMPRESSION</b></p> <ul style="list-style-type: none"> <li>Inspect the engine compression.</li> </ul> <p>(See <b>COMPRESSION INSPECTION [LF].</b>)</p> <ul style="list-style-type: none"> <li>Is it normal?</li> </ul>	Yes	Go to the next step.
		No	Implement the engine overhaul for repairs, then go to Step 17.
15	<p><b>INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION</b></p> <ul style="list-style-type: none"> <li>Inspect variable valve timing control system operation.</li> </ul> <p>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF].</b>)</p> <ul style="list-style-type: none"> <li>Does variable valve timing control system work properly?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to inspection results, then go to Step 17.
16	<p><b>INSPECT FUEL INJECTOR OPERATION</b></p> <ul style="list-style-type: none"> <li>Remove the fuel injector.</li> <li>Inspect the fuel injector (resistance, injection amount).</li> </ul> <p>(See <b>FUEL INJECTOR INSPECTION [LF].</b>)</p> <ul style="list-style-type: none"> <li>Is the fuel injector normal?</li> </ul>	Yes	Go to the next step.
		No	<p>Replace the fuel injector, then go to the next step.</p> <p>(See <b>FUEL INJECTOR REMOVAL/INSTALLATION [LF].</b>)</p>

17	<b>VERIFY TROUBLESHOOTING OF DTC P2177 COMPLETED</b> <ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Clear the DTC from the PCM memory using the M-MDS.</li><li>• Perform the KOER self-test (using M-MDS) or the HO2S heater, HO2S, and TWC Repair Verification Drive Mode (not using M-MDS).</li></ul> (See <a href="#">KOEO/KOER SELF TEST [LF]</a> .) (See <a href="#">OBD-II DRIVE MODE [LF]</a> .) <ul style="list-style-type: none"><li>• Is the PENDING CODE for this DTC present?</li></ul>	Yes	Replace the PCM, then go to the next step. (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
18	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform "AFTER REPAIR PROCEDURE".</li></ul> (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a> .) <ul style="list-style-type: none"><li>• Is there any DTC present?</li></ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .)
		No	Troubleshooting completed.

## 2008 - MX-5 - Engine

### DTC P2178 [LF]

DTC P2178	Fuel system too rich at off idle
DETECTION CONDITION	<ul style="list-style-type: none"><li>PCM monitors short term fuel trim (SHRTFT), long term fuel trim (LONGFT) during closed loop fuel control at off-idle. If the LONGFT and the sum total of these fuel trims exceed preprogrammed criteria. PCM determines that fuel system is too rich at off-idle.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>This is a continuous monitor. (Fuel system)</li><li>The MIL illuminates if the PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>PENDING CODE is available if the PCM detects the above malfunction conditions during the first drive cycle.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Misfire</li><li>Front HO2S deterioration</li><li>Front HO2S heater malfunction</li><li>MAF sensor malfunction</li><li>Pressure regulator (built-in fuel injection pump) malfunction</li><li>Fuel pump malfunction</li><li>EGR valve improper operation</li><li>Purge solenoid valve improper operation</li><li>Purge solenoid valve malfunction (stuck open)</li><li>Purge solenoid hoses improper connection</li><li>PCV valve malfunction</li><li>Variable valve timing control system improper operation</li><li>PCM malfunction</li></ul>

## Diagnostic procedure

STEP	INSPECTION		ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Fuel system related) been recorded?</li> </ul>	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<b>VERIFY RELATED PENDING CODE OR STORED DTCS</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off, then to the ON position (Engine off).</li> <li>Verify related pending code or stored DTCS.</li> <li>Is other DTC present?</li> </ul>	Yes	If misfire DTC is present, go to Step 8.  If other DTC is present, go to applicable DTC inspection.  (See <a href="#">DTC TABLE [LF].</a> )
		No	If driveability concern is present, go to Step 8.  If not, go to the next step.
4	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> <ul style="list-style-type: none"> <li>Is DTC P2178 on FREEZE FRAME DATA?</li> </ul>	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	<b>VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION SWITCH TO THE ON POSITION/IDLE)</b> <ul style="list-style-type: none"> <li>Access APP1, APP2, ECT, MAF, TP and VSS PIDs using M-MDS.</li> <li>Is there any signal that is far out of specification when the ignition switch is at the ON position and the engine runs?</li> </ul>	Yes	Inspect the sensor and excessive resistance in related wiring harnesses.  Repair if necessary.  Then go to Step 15.
		No	Go to the next step.
6	<b>VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION</b>	Yes	Inspect the sensor and related wiring



	<ul style="list-style-type: none"> <li>Inspect the same PIDs as Step 5 while simulating FREEZE FRAME DATA condition.</li> <li>Is there any signal which causes drastic changes?</li> </ul>	harnesses, repair or replace it. Then go to Step 15.	
7	<b>INSPECT FRONT HO2S</b> <ul style="list-style-type: none"> <li>Inspect the front HO2S (See <b>FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF]</b>.)</li> <li>Is HO2S normal?</li> </ul>	Yes Go to the next step.  No Visually inspect for any gas leakage between the exhaust manifold and the front HO2S.  Then go to Step 15.	
8	<b>VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR</b> <ul style="list-style-type: none"> <li>Connect the M-MDS to the DLC-2</li> <li>Start the engine.</li> <li>Access the MAF PID.</li> <li>Verify that the MAF PID changes quickly according to engine speed.</li> <li>Is the PID normal?</li> </ul>	Yes Go to the next step.  No Replace the MAF/IAT sensor, then go to Step 15.  (See <b>MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION [LF]</b> .)	
9	<b>INSPECT PURGE SOLENOID OPERATION</b> <ul style="list-style-type: none"> <li>Perform Purge Control System Inspection. (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b>.)</li> <li>Does purge control system work properly?</li> </ul>	Yes Go to the next step.  No Repair or replace the malfunctioning part according to inspection result, then go to Step 15.	
10	<b>INSPECT PCV VALVE OPERATION</b> <ul style="list-style-type: none"> <li>Inspect the PCV valve operation. (See <b>POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION [LF]</b>.)</li> <li>Is the PCV valve normal?</li> </ul>	Yes Go to the next step.  No Replace the PCV valve, then go to Step 15.	
11	<b>INSPECT EGR VALVE OPERATION</b> <ul style="list-style-type: none"> <li>Perform EGR Control System Inspection. (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b>.)</li> <li>Does the EGR control system work</li> </ul>	Yes Go to the next step.  No Repair or replace the malfunctioning part according to inspection result, then go to Step 15.	

	properly?		
12	<b>INSPECT FUEL LINE PRESSURE</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Inspect the fuel line pressure. (See <b>FUEL LINE PRESSURE INSPECTION [LF].</b>)</li> <li>• Is the fuel line pressure normal?</li> </ul>	Yes	Go to the next step.
		No	<p>If the fuel pressure is too high, replace fuel pump unit, then go to Step 15.</p> <p>If the fuel line pressure is low, go to the next step.</p>
13	<b>INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE</b> <ul style="list-style-type: none"> <li>• Visually inspect the fuel line for any leakage.</li> <li>• Is fuel leakage found?</li> </ul>	Yes	Replace suspected fuel line, then go to the next step.
		No	<p>Inspect for foreign materials or stain inside fuel filter (low-pressure).</p> <p>If for foreign materials or stain inside fuel filter (low-pressure), clean off the fuel tank and filter.</p> <p>Then go to the next step.</p>
14	<b>INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION</b> <ul style="list-style-type: none"> <li>• Inspect variable valve timing control system operation. (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF].</b>)</li> <li>• Does variable valve timing control system work properly?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to inspection results, then go to the next step.
15	<b>VERIFY TROUBLESHOOTING OF DTC P2178 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Perform the KOER self-test (using M-MDS) or the HO2S heater, HO2S, and TWC Repair Verification Drive Mode (not using M-MDS). (See <b>KOEO/KOER SELF TEST [LF].</b>) (See <b>OBD-II DRIVE MODE [LF].</b>)</li> <li>• Is the PENDING CODE for this DTC present?</li> </ul>	Yes	<p>Replace the PCM, then go to the next step. (See <b>PCM REMOVAL/INSTALLATION [LF].</b>)</p>
		No	Go to the next step.
16	<b>VERIFY AFTER REPAIR PROCEDURE</b>	Yes	Go to the applicable DTC inspection.

	<ul style="list-style-type: none"><li>• Perform "AFTER REPAIR PROCEDURE".</li></ul> <p>(See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</p> <ul style="list-style-type: none"><li>• Is there any DTC present?</li></ul>		(See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.

## 2008 - MX-5 - Engine

### DTC P2187 [LF]

DTC P2187	Fuel system too lean at idle
DETECTION CONDITION	<ul style="list-style-type: none"><li>PCM monitors short term fuel trim (SHRTFT) and long term fuel trim (LONGFT) during closed loop fuel control at idle. If the LONGFT and the sum total of these fuel trims exceed preprogrammed criteria. PCM determines that fuel system is too lean at idle.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>This is a continuous monitor. (Fuel system)</li><li>The MIL illuminates if the PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>PENDING CODE is available if the PCM detects the above malfunction conditions during the first drive cycle.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Misfire</li><li>Front HO2S deterioration</li><li>Front HO2S heater malfunction</li><li>MAF sensor malfunction</li><li>Pressure regulator (built-in fuel injection pump) malfunction</li><li>Fuel pump malfunction</li><li>Fuel filter clogged or restricted</li><li>Fuel leakage on fuel line from fuel delivery pipe and fuel pump</li><li>Leakage exhaust system</li><li>Purge solenoid valve malfunction</li><li>Purge solenoid hoses improper connection</li><li>Air suction in intake air system</li><li>Insufficient engine compression</li></ul>

- Variable valve timing control system improper operation
- PCM malfunction

## Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b> <ul style="list-style-type: none"> <li>• Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Fuel system related) been recorded?</li> </ul>	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>• Verify related Service Bulletins and/or on-line repair information availability.</li> <li>• Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>• If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<b>VERIFY RELATED PENDING CODE OR STORED DTCS</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off, then to the ON position (Engine off).</li> <li>• Verify related pending code or stored DTCS.</li> <li>• Is other DTC present?</li> </ul>	Yes	If misfire DTC is present, go to Step 8.  If other DTC is present, go to applicable DTC inspection.  (See <a href="#">DTC TABLE [LF]</a> .)
		No	If driveability concern is present, go to Step 8.  If not, go to the next step.
4	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> <ul style="list-style-type: none"> <li>• Is DTC P2177 on FREEZE FRAME DATA?</li> </ul>	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	<b>VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION SWITCH TO THE ON POSITION/IDLE)</b> <ul style="list-style-type: none"> <li>• Access APP1, APP2, ECT, MAF and TP PIDs using M-MDS.)</li> <li>• Is there any signal that is far out of specification when the ignition switch is at the ON position and the engine runs?</li> </ul>	Yes	Inspect the sensor and excessive resistance in related wiring harnesses.  Repair if necessary.  Then go to Step 17.
		No	Go to the next step.

6	<b>VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION</b> <ul style="list-style-type: none"> <li>Inspect the same PIDs as Step 4 while simulating FREEZE FRAME DATA condition.</li> <li>Is there any signal which causes drastic changes?</li> </ul>	Yes	Inspect the sensor and related wiring harnesses, repair or replace it.  Then go to Step 17.
7	<b>INSPECT FRONT HO2S</b> <ul style="list-style-type: none"> <li>Inspect the front HO2S             (See <b>FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF]</b>.)</li> <li>Is HO2S normal?</li> </ul>	Yes	Go to the next step.
8	<b>VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR</b> <ul style="list-style-type: none"> <li>Connect the M-MDS to the DLC-2.</li> <li>Start the engine.</li> <li>Access the MAF PID.</li> <li>Verify that the MAF PID changes quickly according to engine speed.</li> <li>Is the PID normal?</li> </ul>	Yes	Go to the next step.
9	<b>INSPECT FOR EXCESSIVE AIR SUCTION OF INTAKE AIR SYSTEM</b> <ul style="list-style-type: none"> <li>Visually inspect for loosen, cracks or damages hoses on intake air system.</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace source of air suction, then go to Step 17.
10	<b>INSPECT PURGE SOLENOID VALVE STUCK OPEN</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect both hoses from purge solenoid valve.</li> <li>Blow air through purge solenoid valve.</li> <li>Does air blow through?</li> </ul>	Yes	Replace the purge solenoid valve.  (See <b>PURGE SOLENOID VALVE REMOVAL/INSTALLATION [LF]</b> .)  Then go to Step 17.
11	<b>INSPECT FUEL LINE PRESSURE</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Inspect the fuel line pressure.             (See <b>FUEL LINE PRESSURE INSPECTION [LF]</b>.)</li> </ul>	Yes	Go to Step 13.
		No	If the fuel pressure is too high, replace fuel pump unit, then go to Step 17.  If the fuel line pressure is low, go to the

	<ul style="list-style-type: none"> <li>Is the fuel line pressure normal?</li> </ul>		next step.
12	<b>INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE</b> <ul style="list-style-type: none"> <li>Visually inspect fuel line for any leakage.</li> <li>Is fuel leakage found?</li> </ul>	Yes	Replace suspected fuel line, then go to Step 17.
		No	Inspect for foreign materials or stain inside fuel filter (low-pressure).  If for foreign materials or stain inside fuel filter (low-pressure), clean off the fuel tank and filter.  Then go to Step 17.
13	<b>INSPECT IGNITION SYSTEM</b> <ul style="list-style-type: none"> <li>Perform spark test.</li> </ul> (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b> .)  <ul style="list-style-type: none"> <li>Is strong blue spark visible at each cylinder?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to spark test results, then go to Step 17.
14	<b>INSPECT ENGINE COMPRESSION</b> <ul style="list-style-type: none"> <li>Inspect the engine compression.</li> </ul> (See <b>COMPRESSION INSPECTION [LF]</b> .)  <ul style="list-style-type: none"> <li>Is it normal?</li> </ul>	Yes	Go to the next step.
		No	Implement the engine overhaul for repairs, then go to Step 17.
15	<b>INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION</b> <ul style="list-style-type: none"> <li>Inspect variable valve timing control system operation.</li> </ul> (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b> .)  <ul style="list-style-type: none"> <li>Does variable valve timing control system work properly?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to inspection results, then go to Step 17.
16	<b>INSPECT FUEL INJECTOR OPERATION</b> <ul style="list-style-type: none"> <li>Remove the fuel injector.</li> <li>Inspect the fuel injector (resistance, injection amount).</li> </ul> (See <b>FUEL INJECTOR INSPECTION [LF]</b> .)  <ul style="list-style-type: none"> <li>Is the fuel injector normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the fuel injector, then go to the next step.
17	<b>VERIFY TROUBLESHOOTING OF DTC P2187 COMPLETED</b>	Yes	Replace the PCM, then go to the next step.

	<ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Clear the DTC from the PCM memory using the M-MDS.</li><li>• Perform the KOER self-test (using M-MDS) or the HO2S heater, HO2S, and TWC Repair Verification Drive Mode (not using M-MDS).</li></ul> <p>(See <a href="#">KOE0/KOER SELF TEST [LF]</a>.)</p> <p>(See <a href="#">OBD-II DRIVE MODE [LF]</a>.)</p> <ul style="list-style-type: none"><li>• Is the PENDING CODE for this DTC present?</li></ul>		(See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
18	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform "AFTER REPAIR PROCEDURE".</li></ul> <p>(See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</p> <ul style="list-style-type: none"><li>• Is there any DTC present?</li></ul>	Yes	Go to the applicable DTC inspection.  (See <a href="#">DTC TABLE [LF]</a> .)
		No	Troubleshooting completed.



## 2008 - MX-5 - Engine

### DTC P2188 [LF]

DTC P2188	Fuel system too rich at idle
DETECTION CONDITION	<ul style="list-style-type: none"><li>PCM monitors short term fuel trim (SHRTFT), long term fuel trim (LONGFT) during closed loop fuel control at idle. If the LONGFT and the sum total of these fuel trims exceed preprogrammed criteria. PCM determines that fuel system is too rich at idle.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>This is a continuous monitor. (Fuel system)</li><li>The MIL illuminates if the PCM detects the above malfunctioning condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>PENDING CODE is available if the PCM detects the above malfunction conditions during the first drive cycle.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Misfire</li><li>Front HO2S deterioration</li><li>Front HO2S heater malfunction</li><li>MAF sensor malfunction</li><li>Pressure regulator (built-in fuel injection pump) malfunction</li><li>Fuel pump malfunction</li><li>EGR valve stuck open</li><li>Purge solenoid valve improper operation</li><li>Purge solenoid valve malfunction (stuck open)</li><li>Purge solenoid hoses improper connection</li><li>PCV valve malfunction</li><li>Variable valve timing control system improper operation</li><li>PCM malfunction</li></ul>

## Diagnostic procedure

STEP	INSPECTION		ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Fuel system related) been recorded?</li> </ul>	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<b>VERIFY RELATED PENDING CODE OR STORED DTCS</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off, then to the ON position (Engine off).</li> <li>Verify related pending code or stored DTCS.</li> <li>Is other DTC present?</li> </ul>	Yes	If misfire DTC is present, go to Step 8.  If other DTC is present, go to applicable DTC inspection.  (See <a href="#">DTC TABLE [LF].</a> )
		No	If driveability concern is present, go to Step 8.  If not, go to the next step.
4	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> <ul style="list-style-type: none"> <li>Is DTC P2178 on FREEZE FRAME DATA?</li> </ul>	Yes	Go to the next step.
		No	Go to troubleshooting procedures for DTC on FREEZE FRAME DATA.
5	<b>VERIFY CURRENT INPUT SIGNAL STATUS (IGNITION SWITCH TO THE ON POSITION/IDLE)</b> <ul style="list-style-type: none"> <li>Access APP1, APP2, ECT, MAF, TP and VSS PIDs using M-MDS.</li> <li>Is there any signal that is far out of specification when the ignition switch is at the ON position and engine runs?</li> </ul>	Yes	Inspect the sensor and excessive resistance in related wiring harnesses.  Repair or if necessary.  Then go to Step 15.
		No	Go to the next step.
6	<b>VERIFY CURRENT INPUT SIGNAL STATUS UNDER TROUBLE CONDITION</b>	Yes	Inspect the sensor and related wiring

	<ul style="list-style-type: none"> <li>Inspect the same PIDs as Step 5 while simulating FREEZE FRAME DATA condition.</li> <li>Is there any signal which causes drastic changes?</li> </ul>	harnesses, repair or replace it. Then go to Step 15.	
7	<b>INSPECT FRONT HO2S</b> <ul style="list-style-type: none"> <li>Inspect the front HO2S (See <b>FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF].</b>)</li> <li>Is HO2S normal?</li> </ul>	Yes Go to the next step.  No Visually inspect for any gas leakage between the exhaust manifold and the front HO2S.  Then go to Step 15.	
8	<b>VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR</b> <ul style="list-style-type: none"> <li>Connect the M-MDS to the DLC-2.</li> <li>Start the engine.</li> <li>Access the MAF PID.</li> <li>Verify that the MAF PID changes quickly according to engine speed.</li> <li>Is the PID normal?</li> </ul>	Yes Go to the next step.  No Replace the MAF/IAT sensor, then go to Step 15.  (See <b>MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION [LF].</b> )	
9	<b>INSPECT PURGE SOLENOID OPERATION</b> <ul style="list-style-type: none"> <li>Perform Purge Control System Inspection. (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF].</b>)</li> <li>Does purge control system work properly?</li> </ul>	Yes Go to the next step.  No Repair or replace the malfunctioning part according to inspection result, then go to Step 15.	
10	<b>INSPECT PCV VALVE OPERATION</b> <ul style="list-style-type: none"> <li>Inspect the PCV valve operation. (See <b>POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION [LF].</b>)</li> <li>Is the PCV valve normal?</li> </ul>	Yes Go to the next step.  No Replace the PCV valve, then go to Step 15.	
11	<b>INSPECT FUEL LINE PRESSURE</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Inspect the fuel line pressure. (See <b>FUEL LINE PRESSURE INSPECTION [LF].</b>)</li> </ul>	Yes Go to Step 13.  No If the fuel pressure is too high, replace fuel pump unit, then go to Step 15.  If the fuel line pressure is low, go to the next step.	

	Is the fuel line pressure normal?		
12	<b>INSPECT FUEL LINE FROM FUEL PUMP TO FUEL DELIVERY PIPE</b> <ul style="list-style-type: none"> <li>Visually inspect fuel line for any leakage.</li> <li>Is fuel leakage found?</li> </ul>	Yes Replace the fuel line, then go to Step 15.	
		No Inspect for foreign materials or stain inside fuel filter (low-pressure).  If for foreign materials or stain inside fuel filter (low-pressure), clean off fuel tank and filter.  Then go to Step 15.	
13	<b>INSPECT VARIABLE VALVE TIMING CONTROL SYSTEM OPERATION</b> <ul style="list-style-type: none"> <li>Inspect variable valve timing control system operation.                 (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b>.)</li> <li>Does variable valve timing control system work properly?</li> </ul>	Yes Go to the next step.	
		No Repair or replace the malfunctioning part according to inspection results, then go to Step 15.	
14	<b>INSPECT IF EGR VALVE IS STUCK OPEN</b> <ul style="list-style-type: none"> <li>Remove the EGR valve.</li> <li>Does the EGR valve stuck open?</li> </ul>	Yes Clean or replace the EGR valve, then go to the next step.	
		No Go to the next step.	
15	<b>VERIFY TROUBLESHOOTING OF DTC P2188 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Perform the KOER self-test (using M-MDS) or the HO2S heater, HO2S, and TWC Repair Verification Drive Mode (not using M-MDS).                 (See <b>KOEO/KOER SELF TEST [LF]</b>.)                 (See <b>OBD-II DRIVE MODE [LF]</b>.)</li> <li>Is the PENDING CODE for this DTC present?</li> </ul>	Yes Replace the PCM, then go to the next step.  (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)	
		No Go to the next step.	
16	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "AFTER REPAIR PROCEDURE".                 (See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</li> </ul>	Yes Go to the applicable DTC inspection.  (See <b>DTC TABLE [LF]</b> .)	
		No Troubleshooting completed.	

	Is there any DTC present?	
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2008 - MX-5 - Engine

DTC P2195 [LF]

DTC P2195	Front HO2S signal stuck lean
DETECTION CONDITION	<ul style="list-style-type: none"><li>The PCM monitors the front HO2S output when the following conditions are met. If the output is <b>more than 1.15</b> for <b>25 s</b>, the PCM determines that the front HO2S signal remains lean.</li></ul> <p><b>MONITORING CONDITION</b></p> <ul style="list-style-type: none"><li>ECT: <b>more than 70 °C {158 °F}</b></li><li>Engine speed: <b>1,000—3,200 rpm</b></li><li>MAF amount: <b>6—80 g/s {0.80—10.58 lb/min}</b></li><li>Target A/F feedback system status: feedback control</li><li>Output voltage from the middle HO2S: <b>more than 0.2 V</b></li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>This is an intermittent monitor (HO2S).</li><li>The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Front HO2S malfunction</li><li>Fuel injector malfunction</li><li>Insufficient fuel line pressure</li><li>Leakage exhaust gas</li><li>Air suction at intake air system malfunction</li><li>Leakage fuel</li><li>MAF sensor malfunction</li></ul>

ECT sensor malfunction

- PCM malfunction

## Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b> <ul style="list-style-type: none"><li>• Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?</li></ul>	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"><li>• Verify related Service Bulletins and/or on-line repair information availability.</li><li>• Is any related repair information available?</li></ul>	Yes	Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"><li>• If the vehicle is not repaired, go to the next step.</li></ul>
		No	Go to the next step.
3	<b>VERIFY RELATED PENDING CODE OR STORED DTC</b> <ul style="list-style-type: none"><li>• Turn the ignition switch off, then to ON position (Engine off).</li><li>• Verify the related PENDING CODE or stored DTCs.</li><li>• Is the DTC P2177 or P2187 also present?</li></ul>	Yes	Go to applicable DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .)
		No	Go to the next step.
4	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> <ul style="list-style-type: none"><li>• Is DTC P2195 on FREEZE FRAME DATA?</li></ul>	Yes	Go to the next step.
		No	Go to FREEZE FRAME DATA DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .)
5	<b>VERIFY CURRENT INPUT SIGNAL STATUS</b> <ul style="list-style-type: none"><li>• Connect the M-MDS to the DLC-2.</li><li>• Verify the following PIDs. (See <a href="#">PCM INSPECTION [LF]</a>.)<ul style="list-style-type: none"><li>▪ APP1</li><li>▪ APP2</li><li>▪ ECT</li></ul></li></ul>	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results.  Then go to Step 14.

	<ul style="list-style-type: none"> <li>▪ MAF</li> <li>▪ TP</li> <li>▪ VSS</li> </ul> <ul style="list-style-type: none"> <li>• Are the PIDs normal?</li> </ul>		
6	<b>VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA CONDITION</b> <ul style="list-style-type: none"> <li>• Connect the M-MDS to the DLC-2.</li> <li>• Verify the following PIDs under FREEZE FRAME DATA condition. (See <b>PCM INSPECTION [LF]</b>.) <ul style="list-style-type: none"> <li>▪ APP1</li> <li>▪ APP2</li> <li>▪ ECT</li> <li>▪ MAF</li> <li>▪ TP</li> <li>▪ VSS</li> </ul> </li> <li>• Are the PIDs normal?</li> </ul>	YesGo to the next step.	NoInspect the malfunctioning part according to the inspection results.  Then go to Step 14.
7	<b>INSPECT INTAKE AIR SYSTEM FOR EXCESSIVE AIR SUCTION</b> <ul style="list-style-type: none"> <li>• Visually inspect for loosen, cracks or damages hose in intake air system.</li> <li>• Is there any malfunction?</li> </ul>	YesRepair or replace the malfunctioning part, then go to Step 14.	NoGo to the next step.
8	<b>VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR</b> <ul style="list-style-type: none"> <li>• Connect the M-MDS to the DLC-2.</li> <li>• Start the engine.</li> <li>• Access the MAF PID.</li> <li>• Verify that the MAF PID changes quickly according to engine speed.</li> <li>• Is the PID normal?</li> </ul>	YesGo to the next step.	NoReplace the MAF/IAT sensor, then go to Step 14.  (See <b>MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION [LF]</b> .)
9	<b>INSPECT FRONT HO2S</b> <ul style="list-style-type: none"> <li>• Inspect front HO2S. (See <b>FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF]</b>.)</li> </ul>	YesReplace front HO2S, then go to Step 14.  (See <b>FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]</b> .)	NoGo to the next step.



	Is there any malfunction?		
10	<b>INSPECT FUEL INJECTOR</b> <ul style="list-style-type: none"> <li>Inspect fuel injector.</li> </ul> (See <b>FUEL INJECTOR INSPECTION [LF]</b> .) <ul style="list-style-type: none"> <li>Is there any malfunction?</li> </ul>	Yes Replace suspected fuel injector, then go to Step 14.  (See <b>FUEL INJECTOR REMOVAL/INSTALLATION [LF]</b> .)	
		No Go to the next step.	
11	<b>INSPECT FUEL LINE PRESSURE</b> <ul style="list-style-type: none"> <li>Perform the "FUEL LINE PRESSURE INSPECTION".</li> </ul> (See <b>FUEL LINE PRESSURE INSPECTION [LF]</b> .) <ul style="list-style-type: none"> <li>Is there any malfunction?</li> </ul>	Yes Go to the next step.	
		No Go to Step 13.	
12	<b>INSPECT FUEL SYSTEM FOR FUEL LEAKAGE</b> <ul style="list-style-type: none"> <li>Visually inspect fuel leakage in the fuel system.</li> <li>Is there fuel leakage?</li> </ul>	Yes Repair or replace the malfunctioning part, then go to the next step.	
		No Replace the fuel pump unit, then go to the next step.  (See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF]</b> .)	
13	<b>VERIFY TROUBLESHOOTING OF DTC P2195 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Perform the PCM Adopted Memory Produce Drive Mode and HO2S heater, and TWC Repair Verification Drive Mode.</li> </ul> (See <b>OBD-II DRIVE MODE [LF]</b> .) <ul style="list-style-type: none"> <li>Is the PENDING CODE for this DTC present?</li> </ul>	Yes Replace the PCM, then go to the next step.  (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)	
		No Go to the next step.	
14	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "AFTER REPAIR PROCEDURE".</li> </ul> (See <b>AFTER REPAIR PROCEDURE [LF]</b> .) <ul style="list-style-type: none"> <li>Is any DTC present?</li> </ul>	Yes Go to the applicable DTC inspection.  (See <b>DTC TABLE [LF]</b> .)	
		No Troubleshooting completed.	



## 2008 - MX-5 - Engine

### DTC P2196 [LF]

DTC P2196	Front HO2S signal stuck rich
DETECTION CONDITION	<ul style="list-style-type: none"><li>The PCM monitors the front HO2S output current when the following conditions are met. If the output current is <b>less than 0.85</b> for <b>25 s</b>, the PCM determines that the front HO2S signal remains rich.</li></ul> <p><b>MONITORING CONDITION</b></p> <ul style="list-style-type: none"><li>ECT: <b>more than 70 °C {158 °F}</b></li><li>Engine speed: <b>1,000—3,200 rpm</b></li><li>MAF amount: <b>6—80 g/s {0.80—10.58 lb/min}</b></li><li>Target A/F feedback system status: feedback control</li><li>Output voltage from the middle HO2S: <b>less than 0.7 V</b></li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>This is an intermittent monitor (HO2S).</li><li>The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Front HO2S malfunction</li><li>Fuel injector malfunction</li><li>Excessive fuel pressure</li><li>Restriction in intake air system</li><li>MAF sensor malfunction</li><li>ECT sensor malfunction</li><li>PCM malfunction</li></ul>

## Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?</li> </ul>	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<b>VERIFY RELATED PENDING CODE OR STORED DTC</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off, then ON position (Engine off).</li> <li>Verify the related PENDING CODE or stored DTCs.</li> <li>Is the DTC P2177 or P2187 also present?</li> </ul>	Yes	Go to the appropriate DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	Go to the next step.
4	<b>IDENTIFY TRIGGER DTC FOR FREEZE FRAME DATA</b> <ul style="list-style-type: none"> <li>Is DTC P2196 on FREEZE FRAME DATA?</li> </ul>	Yes	Go to the next step.
		No	Go to FREEZE FRAME DATA DTC inspection. (See <b>DTC TABLE [LF]</b> .)
5	<b>VERIFY CURRENT INPUT SIGNAL STATUS</b> <ul style="list-style-type: none"> <li>Connect the M-MDS to the DLC-2.</li> <li>Verify the following PIDs. (See <b>PCM INSPECTION [LF]</b>.) <ul style="list-style-type: none"> <li>APP1</li> <li>APP2</li> <li>ECT</li> <li>MAF</li> <li>TP</li> </ul> </li> </ul>	Yes	Go to the next step.
		No	Inspect the malfunctioning part according to the inspection results. Then go to Step 11.

	<ul style="list-style-type: none"> <li>▪ VSS</li> </ul> <ul style="list-style-type: none"> <li>• Are the PIDs normal?</li> </ul>		
6	<b>VERIFY CURRENT INPUT SIGNAL STATUS UNDER FREEZE FRAME DATA CONDITION</b> <ul style="list-style-type: none"> <li>• Connect the M-MDS to the DLC-2.</li> <li>• Verify the following PIDs under the FREEZE FRAME DATA condition. <ul style="list-style-type: none"> <li>▪ APP1</li> <li>▪ APP2</li> <li>▪ ECT</li> <li>▪ MAF</li> <li>▪ TP</li> <li>▪ VSS</li> </ul> </li> <li>• Are the PIDs normal?</li> </ul>	YesGo to the next step.	No Inspect the malfunctioning part according to the inspection results.  Then go to Step 11.
7	<b>VERIFY CURRENT INPUT SIGNAL STATUS OF MAF SENSOR</b> <ul style="list-style-type: none"> <li>• Connect the M-MDS to the DLC-2.</li> <li>• Start the engine.</li> <li>• Access the MAF PID.</li> <li>• Verify that the MAF PID changes quickly according to engine speed.</li> <li>• Is the PID normal?</li> </ul>	YesGo to the next step.	No Replace the MAF/IAT sensor, then go to Step 11.  (See <b>MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION [LF]</b> .)
8	<b>INSPECT FRONT HO2S</b> <ul style="list-style-type: none"> <li>• Inspect the front HO2S. (See <b>FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF]</b>.)</li> <li>• Is there any malfunction?</li> </ul>	YesReplace front HO2S, then go to Step 11.  (See <b>FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]</b> .)	No Go to the next step.
9	<b>INSPECT FUEL INJECTOR</b> <ul style="list-style-type: none"> <li>• Inspect fuel injector. (See <b>FUEL INJECTOR INSPECTION [LF]</b>.)</li> <li>• Is there any malfunction?</li> </ul>	YesReplace suspected fuel injector, then go to Step 11.  (See <b>FUEL INJECTOR REMOVAL/INSTALLATION [LF]</b> .)	No Go to the next step.
10	<b>INSPECT FUEL LINE PRESSURE</b> <ul style="list-style-type: none"> <li>• Perform the “FUEL LINE</li> </ul>	YesReplace the fuel pump unit, then go to the next step.	

	<p>PRESSURE INSPECTION".</p> <p>(See <a href="#">FUEL LINE PRESSURE INSPECTION [LF]</a>.)</p> <ul style="list-style-type: none"><li>• Is there any malfunction?</li></ul>		<p>(See <a href="#">FUEL PUMP UNIT REMOVAL/INSTALLATION [LF]</a>.)</p>
		No	Go to the next step.
11	<p><b>VERIFY TROUBLESHOOTING OF DTC P2196 COMPLETED</b></p> <ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Clear the DTC from the PCM memory using the M-MDS.</li><li>• Perform the PCM Adopted Memory Produce Drive Mode and HO2S heater, and TWC Repair Verification Drive Mode.</li></ul> <p>(See <a href="#">OBD-II DRIVE MODE [LF]</a>.)</p> <ul style="list-style-type: none"><li>• Is the PENDING CODE for this DTC present?</li></ul>	Yes	Replace the PCM, then go to the next step.
		No	Go to the next step.
12	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"><li>• Perform the "AFTER REPAIR PROCEDURE".</li></ul> <p>(See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</p> <ul style="list-style-type: none"><li>• Is any DTC present?</li></ul>	Yes	Go to the applicable DTC inspection.
		No	Troubleshooting completed.

## 2008 - MX-5 - Engine

### DTC P2228 [LF]

DTC P2228	BARO sensor circuit low input
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM monitors input voltage from BARO sensor. If input voltage is <b>below 2.1 V</b>, PCM determines that BARO sensor circuit has malfunction.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>BARO sensor malfunction</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b>	Yes Perform repair or diagnosis according to the available repair information.
	<ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	<ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> No Go to the next step.

3	<b>INSPECT BARO SENSOR MALFUNCTION</b> <ul style="list-style-type: none"> <li>Inspect the BARO sensor.</li> </ul> <p>(See <b>BAROMETRIC PRESSURE (BARO) SENSOR INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>Is the BARO sensor okay?</li> </ul>	Yes	Go to the next step.
		No	Replace the PCM, then go to the next step. (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)
4	<b>VERIFY TROUBLESHOOTING OF DTC P2228 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Start the engine.</li> <li>Is the same DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step. (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)
		No	No concern is detected. Go to the next step.
5	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "AFTER REPAIR PROCEDURE".</li> </ul> <p>(See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</p> <ul style="list-style-type: none"> <li>Is there any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.



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### DTC P2229 [LF]

DTC P2229	BARO sensor circuit high input
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM monitors input voltage from BARO sensor. If input voltage is <b>above 4.0 V</b>, PCM determines that BARO sensor circuit has malfunction.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>BARO sensor malfunction</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	YesGo to the next step.
		NoRecord the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	YesPerform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		NoGo to the next step.

3	<b>INSPECT BARO SENSOR MALFUNCTION</b> <ul style="list-style-type: none"> <li>Inspect the BARO sensor.</li> <li>(See <b>BAROMETRIC PRESSURE (BARO) SENSOR INSPECTION [LF]</b>.)</li> <li>Is the BARO sensor okay?</li> </ul>	Yes	Go to the next step.
		No	Replace the PCM, then go to the next step. (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)
4	<b>VERIFY TROUBLESHOOTING OF DTC P2229 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Start the engine.</li> <li>Is the same DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step. (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)
		No	No concern is detected. Go to the next step.
5	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform "AFTER REPAIR PROCEDURE".</li> <li>(See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to applicable DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.

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DTC P2401 [LF]

DTC P2401	EVAP system leak detection pump motor circuit low
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors pump load current (EVAP line pressure), while evaporative leak monitor is operating. If the pump load current is lower than specified, the PCM determines EVAP system leak detection pump motor circuit has a malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a intermittent monitor (CCM).</li><li>• The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• EVAP system leak detection pump malfunction</li><li>• Open circuit between the main relay and EVAP system leak detection pump terminal A</li><li>• Open circuit between the EVAP system leak detection pump terminal D and PCM terminal 1U</li><li>• Short to ground circuit between the EVAP system leak detection pump terminal D and PCM terminal 1U</li><li>• Poor connection at EVAP system leak detection pump or PCM connector</li><li>• PCM malfunction</li></ul>



	<p>and/or on-line repair information availability.</p> <ul style="list-style-type: none"> <li>Is any related repair information available?</li> </ul>		<ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<p><b>VERIFY RELATED PENDING CODE OR STORED DTC</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch off, then to the ON position (Engine off).</li> <li>Verify related PENDING CODE or stored DTC.</li> <li>Is DTC P2405 present?</li> </ul>	Yes	Go to the applicable DTC inspection.  (See <a href="#">DTC P2405 [LF]</a> .)
		No	Go to the next step.
4	<p><b>INSPECT EVAP SYSTEM LEAK DETECTION PUMP CONNECTOR FOR POOR CONNECTION</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect EVAP system leak detection pump connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 11.
		No	Go to the next step.
5	<p><b>INSPECT EVAP SYSTEM LEAK DETECTION PUMP MOTOR GROUND CIRCUIT FOR OPEN CIRCUIT</b></p> <ul style="list-style-type: none"> <li>Inspect for continuity between EVAP system leak detection pump terminal B (wiring harness-side) and body ground.</li> <li>Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace wiring harness for open circuit, then go to Step 11.
6	<p><b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the PCM connector.</li> <li>Inspect for poor connection (such as damaged, pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair the terminal, then go to Step 10.
		No	Go to the next step.
7	<p><b>INSPECT EVAP SYSTEM LEAK DETECTION PUMP MOTOR CIRCUIT FOR SHORT TO GROUND</b></p> <ul style="list-style-type: none"> <li>Inspect for continuity between EVAP system leak detection pump terminal D (wiring harness-side) and body ground.</li> </ul>	Yes	Repair or replace the wiring harness for short to ground, then go to Step 11.
		No	Go to the next step.

	<ul style="list-style-type: none"> <li>Is there continuity?</li> </ul>		
8	<b>INSPECT EVAP SYSTEM LEAK DETECTION PUMP MOTOR CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for continuity between EVAP system leak detection pump terminal D (wiring harness-side) and PCM terminal 1U (wiring harness-side).</li> <li>Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace wiring harness for open circuit, then go to Step 11.
9	<b>INSPECT EVAP SYSTEM LEAK DETECTION PUMP POWER CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for continuity between EVAP system leak detection pump terminal A (wiring harness-side) and main relay.</li> <li>Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace wiring harness for open circuit, then go to Step 11.
10	<b>INSPECT EVAP SYSTEM LEAK DETECTION PUMP</b> <ul style="list-style-type: none"> <li>Perform EVAP system leak detection pump inspection. (See <b>EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION [LF].</b>)</li> <li>Is the EVAP system leak detection pump normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the EVAP system leak detection pump, then go to the next step. (See <b>EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP REMOVAL/INSTALLATION [LF].</b> )
11	<b>VERIFY TROUBLESHOOTING OF DTC P2401 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Perform the evaporative emission test using the M-MDS. (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF].</b>)</li> <li>Is the same DTC present?</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>If evaporative system test function is not available, perform the following procedure:</li> </ul>	Yes	Replace the PCM, then go to the next step. (See <b>PCM REMOVAL/INSTALLATION [LF].</b> )
		No	Go to the next step.

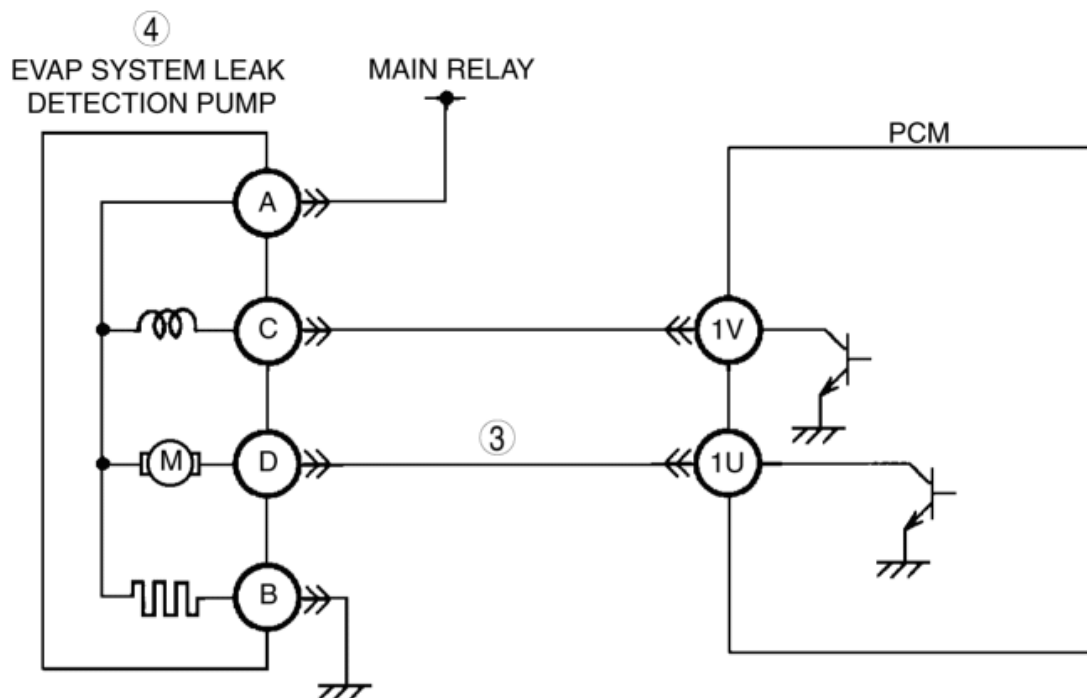
	<p>Perform the EVAP System Repair Verification Drive Mode.</p> <p>(See <b>OBD-II DRIVE MODE [LF]</b>.)</p> <ul style="list-style-type: none"><li>▪ Is the PENDING CODE the same as the DTC present?</li></ul>		
12	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"><li>• Perform "AFTER REPAIR PROCEDURE".</li></ul> <p>(See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</p> <ul style="list-style-type: none"><li>• Is any DTC present?</li></ul>	Yes	Go to the applicable DTC inspection.  (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.

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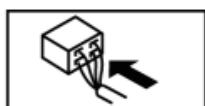
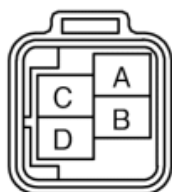
DTC P2402 [LF]

DTC P2402	EVAP system leak detection pump motor circuit high
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors pump load current (EVAP line pressure), while evaporative leak monitor is operating. If the pump load current is higher than specified, the PCM determines EVAP system leak detection pump motor circuit has a malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a intermittent monitor (CCM).</li><li>• The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Short to power circuit between the EVAP system leak detection pump terminal D and PCM terminal 1U</li><li>• EVAP system leak detection pump malfunction</li><li>• PCM malfunction</li></ul>



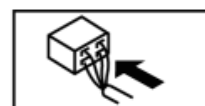


EVAP SYSTEM LEAK DETECTION PUMP  
HARNESS SIDE CONNECTOR



PCM  
HARNESS SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step. No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> No Go to the next step.
3	<b>INSPECT EVAP SYSTEM LEAK DETECTION PUMP CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position.</li> <li>Disconnect the EVAP system leak detection pump</li> </ul>	Yes Repair or replace the wiring harness, then go to the next step. No Go to the next step.

	<p>connector.</p> <ul style="list-style-type: none"><li>• Measure the voltage between EVAP system leak detection pump terminal D (wiring harness-side) and body ground.</li><li>• Is the voltage <b>B+</b>?</li></ul>		
4	<p><b>INSPECT EVAP SYSTEM LEAK DETECTION PUMP RESISTANCE</b></p> <ul style="list-style-type: none"><li>• Inspect resistance between EVAP system leak detection pump terminal A and D.</li></ul> <p>(See <b>EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION [LF]</b>)</p> <ul style="list-style-type: none"><li>• Is the resistance normal?</li></ul>	Yes	Go to the next step.
		No	Replace the EVAP system leak detection pump, then go to the next step.  (See <b>EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP REMOVAL/INSTALLATION [LF]</b> )
5	<p><b>VERIFY TROUBLESHOOTING OF DTC P2402 COMPLETED</b></p> <ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Clear the DTC from the PCM memory using the M-MDS.</li><li>• Perform the evaporative system test using the M-MDS.</li></ul> <p>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"><li>• Is the same DTC present?</li></ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"><li>• If evaporative system test function is not available, perform the following procedure:<ul style="list-style-type: none"><li>▪ Perform the EVAP System Repair Verification Drive Mode.</li></ul></li><li>• (See <b>OBD-II DRIVE MODE [LF]</b>.)</li><li>▪ Is the PENDING CODE the same as the DTC present?</li></ul>	Yes	Replace the PCM, then go to the next step.  (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)
		No	Go to the next step.
6	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"><li>• Perform "AFTER REPAIR PROCEDURE".</li></ul> <p>(See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</p> <ul style="list-style-type: none"><li>• Is any DTC present?</li></ul>	Yes	Go to the applicable DTC inspection.  (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.

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### DTC P2404 [LF]

DTC P2404	EVAP system leak detection pump sense circuit problem
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors pump load current (EVAP line pressure), while evaporative leak monitor is operating. After obtaining the reference current value, if the time in which the pump load current reaches the reference current value is less than the specification, the PCM determines air filter has a malfunction.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a intermittent monitor (CCM).</li> <li>The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Air filter clogging</li> <li>EVAP hose bending</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-</li> </ul>	Yes Perform repair or diagnosis according to the available repair information.

	<p>line repair information availability.</p> <ul style="list-style-type: none"> <li>Is any related repair information available?</li> </ul>		If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	<p><b>INSPECT EVAP HOSE BENDING</b></p> <ul style="list-style-type: none"> <li>Inspect the EVAP hose for bending.</li> <li>Is the EVAP hose normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the hose, then go to Step 5.
4	<p><b>INSPECT AIR FILTER FOR CLOGGING</b></p> <ul style="list-style-type: none"> <li>Inspect the air filter for clogging.</li> <li>Is the air filter normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the air filter, then go to the next step.
5	<p><b>VERIFY TROUBLESHOOTING OF DTC P2404 COMPLETED</b></p> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Perform the evaporative system test using the M-MDS.</li> </ul> <p>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>Is the same DTC present?</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>If evaporative system test function is not available, perform the following procedure: <ul style="list-style-type: none"> <li>Perform the EVAP System Repair Verification Drive Mode.</li> </ul> <p>(See <b>OBD-II DRIVE MODE [LF]</b>.)</p> <li>Is the PENDING CODE the same as the DTC present?</li> </li></ul>	Yes	<p>Replace the PCM, then go to the next step.</p> <p>(See <b>PCM REMOVAL/INSTALLATION [LF]</b>.)</p>
		No	Go to the next step.
6	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"> <li>Perform "AFTER REPAIR PROCEDURE".</li> </ul> <p>(See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</p> <ul style="list-style-type: none"> <li>Is any DTC present?</li> </ul>	Yes	<p>Go to the applicable DTC inspection.</p> <p>(See <b>DTC TABLE [LF]</b>.)</p>
		No	Troubleshooting completed.

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### DTC P2405 [LF]

DTC P2405	EVAP system leak detection pump sense circuit low input
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors pump load current (EVAP line pressure), while evaporative leak monitor is operating. If the current is lower than the specification while the PCM obtains the reference current value, the PCM determines EVAP system leak detection pump orifice has a malfunction.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a intermittent monitor (CCM).</li> <li>The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the malfunction has been stored in the PCM.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>EVAP system leak detection pump orifice fallen off</li> <li>EVAP system leak detection pump motor malfunction</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-</li> </ul>	Yes Perform repair or diagnosis according to the available repair information.

	<p>line repair information availability.</p> <ul style="list-style-type: none"> <li>Is any related repair information available?</li> </ul>		<p>If the vehicle is not repaired, go to the next step.</p>
		No	Go to the next step.
3	<p><b>VERIFY TROUBLESHOOTING OF DTC P2405 COMPLETED</b></p> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Perform the evaporative emission test using the M-MDS.</li> </ul> <p>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>Is the same DTC present?</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>If evaporative system test function is not available, perform the following procedure: <ul style="list-style-type: none"> <li>Perform the EVAP System Repair Verification Drive Mode.</li> </ul> <p>(See <b>OBD-II DRIVE MODE [LF]</b>.)</p> <li>Is the PENDING CODE the same as the DTC present?</li> </li></ul>	Yes	<p>Replace the PCM, then go to the next step.</p> <p>(See <b>PCM REMOVAL/INSTALLATION [LF]</b>.)</p>
		No	Go to the next step.
4	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"> <li>Perform "AFTER REPAIR PROCEDURE".</li> </ul> <p>(See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</p> <ul style="list-style-type: none"> <li>Is any DTC present?</li> </ul>	Yes	<p>Go to the applicable DTC inspection.</p> <p>(See <b>DTC TABLE [LF]</b>.)</p>
		No	Troubleshooting completed.

## 2008 - MX-5 - Engine

### DTC P2407 [LF]

DTC P2407	EVAP system leak detection pump sense circuit intermittent
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors pump load current (EVAP line pressure), while evaporative leak monitor is operating. When either of the following is detected 6 times or more successively, the PCM determines EVAP system leak detection pump heater has a malfunction: <ul style="list-style-type: none"> <li>While obtaining the reference current value, the change in pump load current exceeds the specification.</li> <li>After obtaining the reference current value, the pump load current is kept lower than the maximum pump load current for more than the specified time.</li> </ul> </li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a intermittent monitor (CCM).</li> <li>The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the malfunction has been stored in the PCM.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>EVAP system leak detection pump heater malfunction</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.



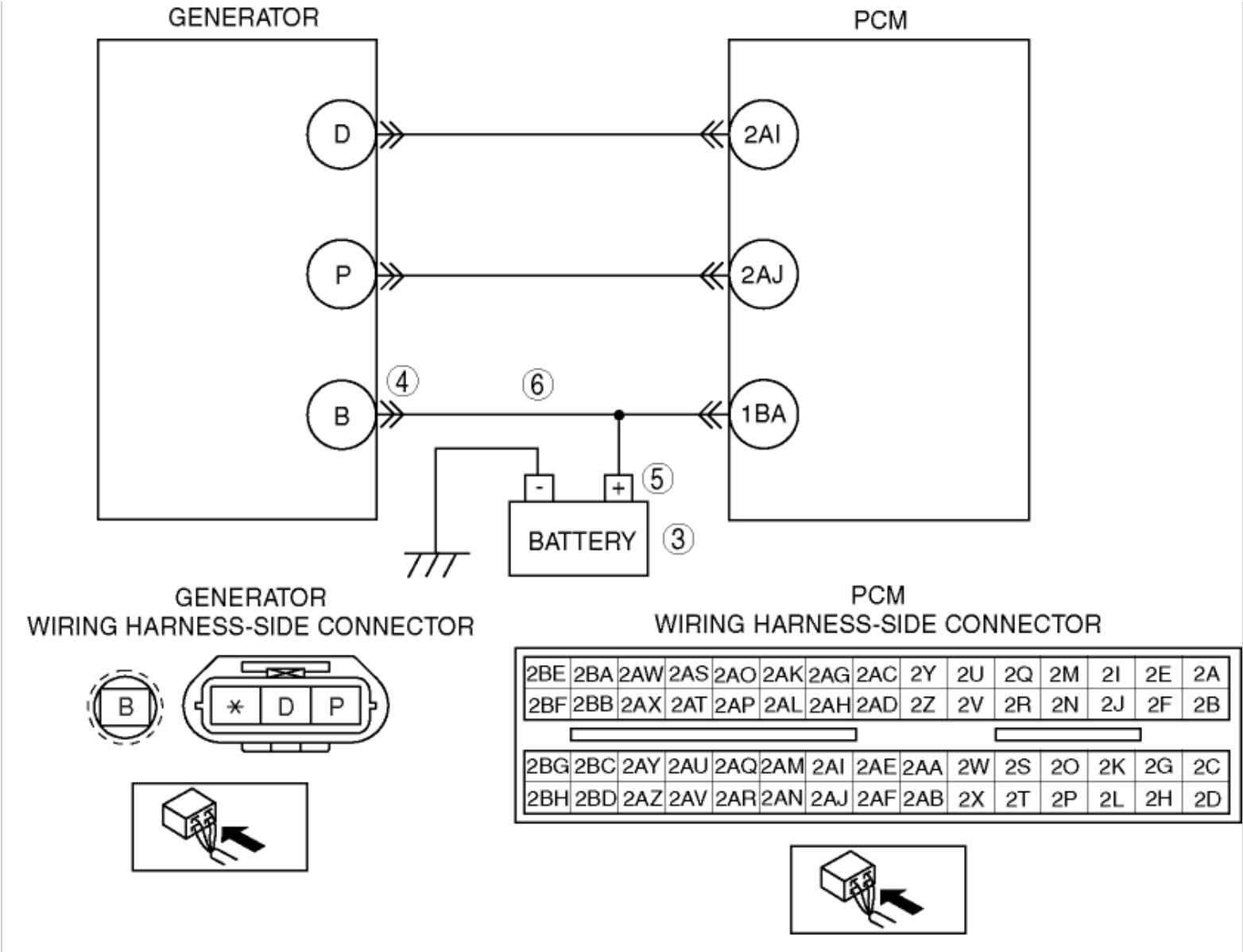
2	<p><b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b></p> <ul style="list-style-type: none"> <li>• Verify related Service Bulletins and/or on-line repair information availability.</li> <li>• Is any related repair information available?</li> </ul>	<p>Yes Perform repair or diagnosis according to the available repair information.</p> <ul style="list-style-type: none"> <li>• If the vehicle is not repaired, go to the next step.</li> </ul> <p>No Go to the next step.</p>
3	<p><b>INSPECT EVAP SYSTEM LEAK DETECTION PUMP HEATER</b></p> <ul style="list-style-type: none"> <li>• Perform EVAP system leak detection pump inspection.</li> </ul> <p>(See <b>EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>• Is the EVAP system leak detection pump normal?</li> </ul>	<p>Yes Replace the EVAP system leak detection pump, then go to the next step.</p> <p>(See <b>EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP REMOVAL/INSTALLATION [LF]</b>.)</p> <p>No Go to the next step.</p>
4	<p><b>VERIFY TROUBLESHOOTING OF DTC P2407 COMPLETED</b></p> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Perform the evaporative emission test using the M-MDS.</li> </ul> <p>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>• Is the same DTC present?</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• If evaporative system test function is not available, perform the following procedure: <ul style="list-style-type: none"> <li>▪ Perform the EVAP System Repair Verification Drive Mode.</li> </ul> <p>(See <b>OBD-II DRIVE MODE [LF]</b>.)</p> <li>▪ Is the PENDING CODE the same as the DTC present?</li> </li></ul>	<p>Yes Replace the PCM, then go to the next step.</p> <p>(See <b>PCM REMOVAL/INSTALLATION [LF]</b>.)</p> <p>No Go to the next step.</p>

5	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform "AFTER REPAIR PROCEDURE".</li></ul> (See <b>AFTER REPAIR PROCEDURE [LF]</b> .)	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.

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DTC P2502 [LF]

DTC P2502	Charging system voltage problem
DETECTION CONDITION	<ul style="list-style-type: none"><li>PCM judges generator output voltage is <b>above 17 V</b> or battery voltage is <b>below 11 V</b> during engine running.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>This is a continuous monitor (Other).</li><li>The MIL does not illuminate.</li><li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Open circuit between generator terminal B and battery positive terminal</li><li>Battery malfunction</li><li>Generator malfunction</li><li>PCM is poorly connected</li><li>PCM, generator and/or battery are poorly connected</li></ul>



Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"><li>Has FREEZE FRAME DATA been recorded?</li></ul>	YesGo to the next step.
		NoRecord the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"><li>Verify related Service Bulletins and/or on-line repair information availability.</li><li>Is any related repair information available?</li></ul>	YesPerform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"><li>If the vehicle is not repaired, go to the next step.</li></ul>
		NoGo to the next step.
3	<b>INSPECT BATTERY</b>	YesGo to the next step.

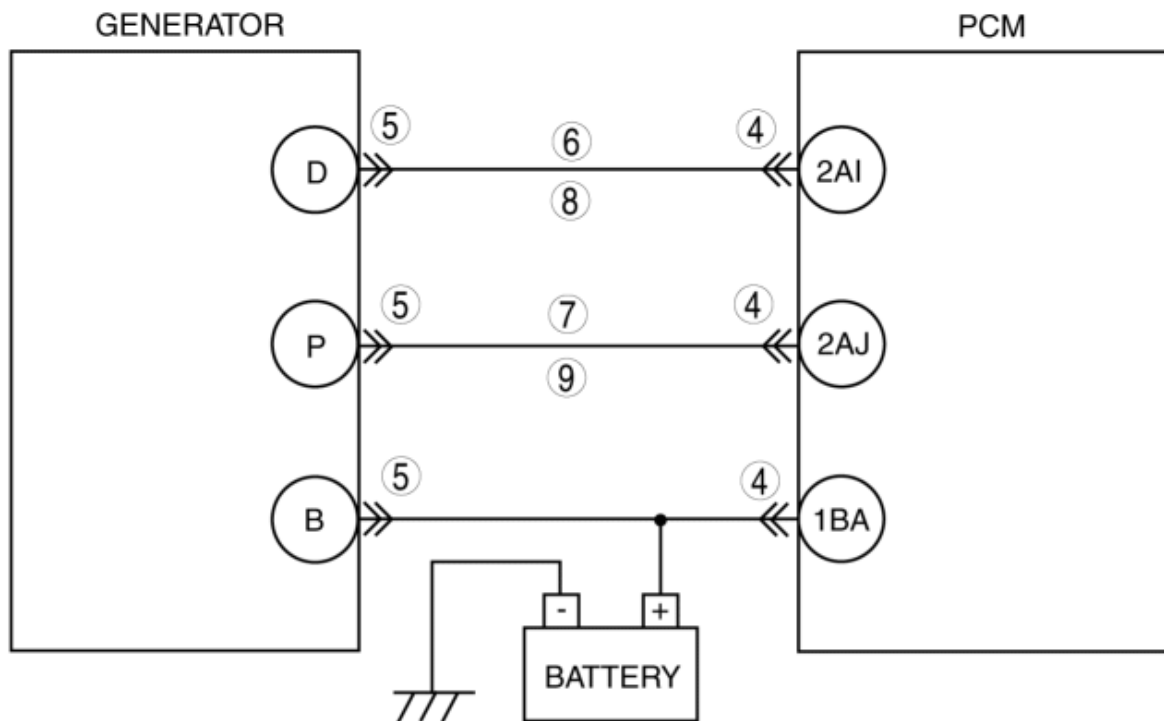
	<p>Turn the ignition switch off.</p> <ul style="list-style-type: none"> <li>• Inspect the battery.</li> <li>• Is the battery normal?</li> </ul>		No Replace the battery, then go to Step 7.
4	<p><b>INSPECT POOR INSTALLATION OF GENERATOR TERMINAL</b></p> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Inspect for looseness of generator terminal B installation nut.</li> <li>• Is nut loose?</li> </ul>	Yes	Tighten generator terminal B installation nut, then go to Step 7.
		No	Go to the next step.
5	<p><b>INSPECT POOR INSTALLATION OF BATTERY POSITIVE TERMINAL</b></p> <ul style="list-style-type: none"> <li>• Inspect for looseness of battery positive terminal.</li> <li>• Is the terminal loose?</li> </ul>	Yes	Connect the battery positive terminal correctly, then go to Step 7.
		No	Go to the next step.
6	<p><b>INSPECT BATTERY CHARGING CIRCUIT</b></p> <ul style="list-style-type: none"> <li>• Disconnect the generator terminal B.</li> <li>• Measure the voltage between generator terminal B (wiring harness-side) and body ground.</li> <li>• Is the voltage <b>B+</b>?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness between generator terminal B and battery positive terminal, then go to the next step.
7	<p><b>VERIFY TROUBLESHOOTING OF DTC P2502 COMPLETED</b></p> <ul style="list-style-type: none"> <li>• Make sure to reconnect all connectors.</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Start the engine, or perform the KOER self-test with M-MDS.</li> </ul> <p>(See <a href="#">KOE0/KOER SELF TEST [LF]</a>.)</p> <ul style="list-style-type: none"> <li>• Is the same DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step. (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
8	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"> <li>• Perform "AFTER REPAIR PROCEDURE".</li> </ul> <p>(See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</p> <ul style="list-style-type: none"> <li>• Is there any DTC present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .)
		No	Troubleshooting completed.



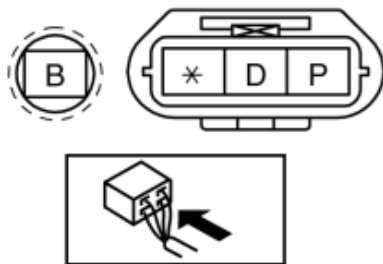
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DTC P2503 [LF]

DTC P2503	Charging system voltage low
DETECTION CONDITION	<ul style="list-style-type: none"><li>PCM needs <b>more than 20 A</b> from generator, and judges generator output voltage to be <b>below 8.5 V</b> during engine running.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>This is a continuous monitor (Other).</li><li>The MIL does not illuminate.</li><li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Generator malfunction</li><li>PCM and/or generator are poorly connected</li><li>Open and/or short to ground in wiring from between generator terminal P and PCM terminal 2AJ</li><li>Open and/or short to ground in wiring from between generator terminal D and PCM terminal 2AI</li><li>Drive belt misadjustment</li></ul>



GENERATOR  
WIRING HARNESS-SIDE CONNECTOR



PCM  
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>INSPECT DRIVE BELT CONDITION</b>	Yes Go to the next step.



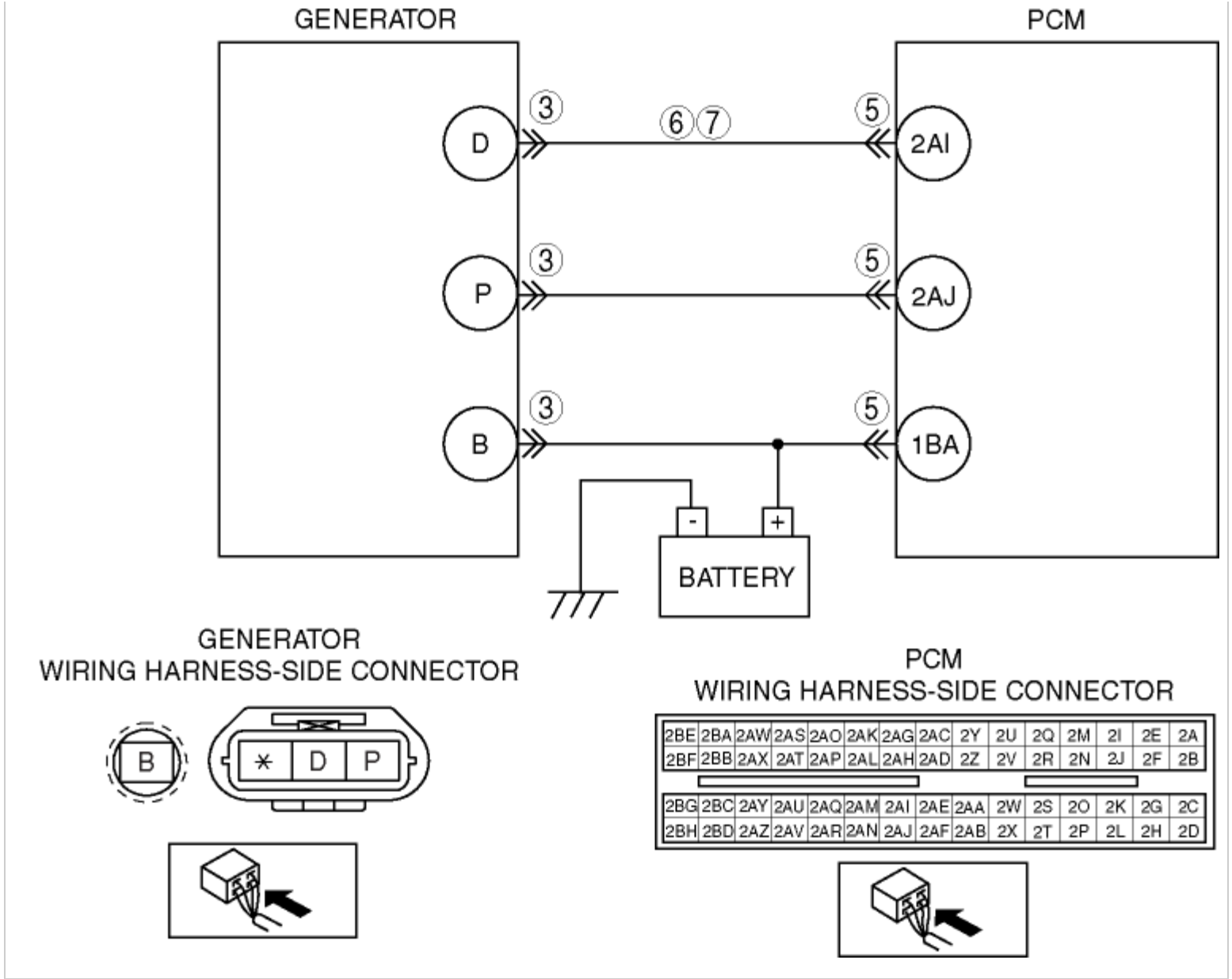
	<ul style="list-style-type: none"> <li>• Verify that drive belt auto tensioner indicator mark does not exceed limit.</li> <li>• Is drive belt normal?</li> </ul>	No	Replace and/or adjust drive belt, then go to Step 10.
4	<b>INSPECT POOR CONNECTION OF PCM CONNECTOR</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect PCM connector.</li> <li>• Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair the terminals, then go to Step 10.
		No	Go to the next step.
5	<b>INSPECT POOR CONNECTION OF GENERATOR CONNECTOR</b> <ul style="list-style-type: none"> <li>• Disconnect generator connector.</li> <li>• Inspect for poor connection (damaged, pulled-out terminals, corrosion, etc.).</li> <li>• Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminals, then go to Step 10.
		No	Go to the next step.
6	<b>INSPECT GENERATOR CONTROL CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between generator terminal D (wiring harness-side) and body ground.</li> <li>• Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness for short to ground, then go to Step 10.
		No	Go to the next step.
7	<b>INSPECT GENERATOR OUTPUT VOLTAGE MONITOR CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between generator terminal P (wiring harness-side) and body ground.</li> <li>• Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness for short to ground, then go to Step 10.
		No	Go to the next step.
8	<b>INSPECT GENERATOR CONTROL CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between generator terminal D (wiring harness-side) and PCM terminal 2AI (wiring harness-side).</li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to Step 10.
9	<b>INSPECT GENERATOR OUTPUT VOLTAGE MONITOR CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between generator terminal P (wiring harness-side) and PCM terminal 2AJ (wiring harness-side).</li> <li>• Is there continuity?</li> </ul>	Yes	Repair or replace the generator, then go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to the next step.
10	<b>VERIFY TROUBLESHOOTING OF DTC P2503 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all connectors.</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Start the engine, or perform the KOER self-test with M-MDS.</li> </ul>	Yes	Replace the PCM, then go to the next step.  (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.

	(See <a href="#">KOE0/KOER SELF TEST [LF].</a> )		
	<ul style="list-style-type: none"><li>Is the same DTC present?</li></ul>		
11	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>Perform "AFTER REPAIR PROCEDURE".</li></ul> (See <a href="#">AFTER REPAIR PROCEDURE [LF].</a> )	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [LF].</a> )
		No	Troubleshooting completed.

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DTC P2504 [LF]

DTC P2504	Charging system voltage high
DETECTION CONDITION	<ul style="list-style-type: none"><li>PCM judges generator output voltage is <b>above 18.5 V</b> or battery voltage is <b>above 16.0 V</b> during engine running.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>This is a continuous monitor (Other).</li><li>The MIL does not illuminate.</li><li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Short to power circuit between generator connector terminal D and PCM connector terminal 2AI</li><li>Generator malfunction</li><li>PCM and/or generator are poorly connected</li></ul>



**Diagnostic procedure**

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.

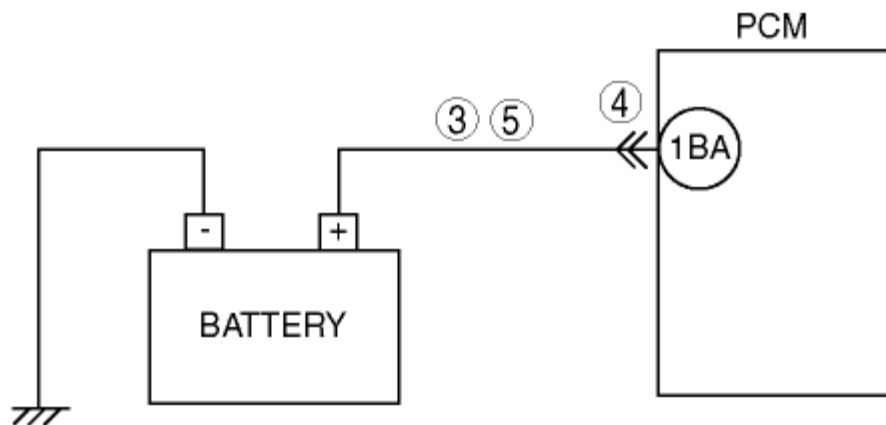
3	<b>INSPECT POOR CONNECTION OF GENERATOR CONNECTOR</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the generator connector.</li> <li>• Inspect for poor connection (damaged/pulled-out terminals, corrosion, etc.).</li> <li>• Is there any malfunction?</li> </ul>	<div>Yes Repair or replace the terminals, then go to Step 8.</div> <div>No Go to the next step.</div>
4	<b>CLASSIFY GENERATOR MALFUNCTION OR OTHER MALFUNCTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON (Engine off).</li> <li>• Measure the voltage between generator terminal D (wiring harness-side) and body ground.</li> <li>• Is the voltage <b>B+</b>?</li> </ul>	<div>Yes Go to the next step.</div> <div>No There is a malfunction at the generator. Go to Step 7.</div>
5	<b>INSPECT POOR CONNECTION OF PCM CONNECTOR</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Disconnect the PCM connector.</li> <li>• Inspect for poor connection (damaged/pulled-out terminals, corrosion, etc.).</li> <li>• Is there any malfunction?</li> </ul>	<div>Yes Repair or replace pins, then go to Step 8.</div> <div>No Go to the next step.</div>
6	<b>INSPECT GENERATOR CONTROL CIRCUIT FOR SHORT TO POWER</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON (engine off).</li> <li>• Measure the voltage between generator terminal D (wiring harness-side) and body ground.</li> <li>• Is the voltage <b>B+</b>?</li> </ul>	<div>Yes Repair or replace the wiring harness for short to power supply, then go to Step 8.</div> <div>No Go to Step 8.</div>
7	<b>INSPECT GENERATOR CONTROL TERMINAL FOR SHORT TO POWER</b> <ul style="list-style-type: none"> <li>• Measure the voltage between generator terminal D (part-side) and body ground.</li> <li>• Is the voltage <b>B+</b>?</li> </ul>	<div>Yes Repair or replace the generator, then go to the next step.</div> <div>No Go to the next step.</div>
8	<b>VERIFY TROUBLESHOOTING OF DTC P2504 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all connectors.</li> </ul>	<div>Yes Replace the PCM, then go to the next step.</div>

	<ul style="list-style-type: none"><li>• Clear the DTC from the PCM memory using the M-MDS.</li><li>• Start the engine, or perform the KOER self-test with M-MDS.</li></ul> <p>(See <a href="#">KOEO/KOER SELF TEST [LF]</a>.)</p> <ul style="list-style-type: none"><li>• Is the same DTC present?</li></ul>	(See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No Go to the next step.
9	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform "AFTER REPAIR PROCEDURE".</li></ul> <p>(See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</p> <ul style="list-style-type: none"><li>• Is any DTC present?</li></ul>	YesGo to the applicable DTC inspection.  (See <a href="#">DTC TABLE [LF]</a> .)
		No Troubleshooting completed.

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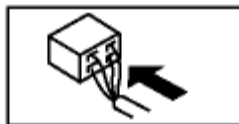
DTC P2507 [LF]

DTC P2507	PCM B+ voltage low
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors the voltage of back-up battery positive terminal. If the PCM detects battery positive terminal voltage <b>below 2.5 V</b> for <b>2 s</b>, the PCM determines that the backup voltage circuit has a malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (CCM).</li><li>• The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Open circuit in wiring between battery positive terminal and PCM terminal 1BA</li><li>• Short to ground in wiring harness between battery positive terminal and PCM terminal 1BA</li><li>• Poor connection of PCM connector</li><li>• PCM malfunction</li></ul>



PCM  
WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>INSPECT MONITOR CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>Disconnect battery cables.</li> </ul>	Yes Repair or replace the wiring harness for short to ground and install new



	<ul style="list-style-type: none"> <li>Inspect for continuity between battery positive terminal wiring harness-side and body ground.</li> <li>Is there continuity?</li> </ul>		fuse, then go to Step 6.
		No	Go to the next step.
4	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Disconnect PCM connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair the terminals, then go to Step 6.
		No	Go to the next step.
5	<b>INSPECT MONITOR CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Disconnect battery cables.</li> <li>Inspect for continuity between battery positive terminal wiring harness-side and PCM terminal 1BA (wiring harness-side).</li> <li>Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for an open circuit, then go to the next step.
6	<b>VERIFY TROUBLESHOOTING OF DTC P2507 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Start the engine and warm it up completely.</li> <li>Is the same DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step.  (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
7	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the "AFTER REPAIR PROCEDURE". (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to the applicable DTC inspection.  (See <a href="#">DTC TABLE [LF]</a> .)
		No	Troubleshooting completed.

## 2008 - MX-5 - Engine

### DTC P2610 [LF]

DTC P2610	PCM internal engine off timer performance
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM internal engine off timer is damaged.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>PCM internal engine off timer is damaged.</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b>	Yes Perform repair or diagnosis according to the available repair information.
	<ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	<ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
	<b>VERIFY TROUBLESHOOTING OF DTC P2610</b>	No Go to the next step.

3	<b>COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all the disconnected connectors.</li> <li>• Clear the DTC from the PCM memory using the M-MDS.</li> <li>• Start the engine.</li> <li>• Is the same DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step.  (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
4	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform the "AFTER REPAIR PROCEDURE".</li> </ul> (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a> .) <ul style="list-style-type: none"> <li>• Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC troubleshooting.  (See <a href="#">DTC TABLE [LF]</a> .)
		No	DTC troubleshooting completed.

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### DTC P0401 [LF]

DTC P0401	EGR flow insufficient detected
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>PCM monitors difference in intake manifold pressures when EGR is operated and when it is stopped. If the difference is too small, PCM determines that EGR flow insufficient.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is an intermittent monitor (EGR system).</li> <li>The MIL illuminates if the PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>EGR valve malfunction</li> <li>MAP sensor malfunction</li> <li>EGR gasket malfunction</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (EGR system related) been recorded?</li> </ul>	No Record FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b>	Yes Perform repair or diagnosis according to the

	<ul style="list-style-type: none"> <li>• Verify related Service Bulletins and/or on-line repair information availability.</li> <li>• Is any related repair information available?</li> </ul>	available repair information. <ul style="list-style-type: none"> <li>• If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>INSPECT FOR OTHER DTCS</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off then to the ON position (Engine off).</li> <li>• Have other DTCs been stored?</li> </ul>	Yes Repair circuit malfunction for applicable DTCs.
		No Go to the next step.
4	<b>INSPECT VACUUM HOSE CONDITION</b> <ul style="list-style-type: none"> <li>• Inspect vacuum hoses for clogs, any damages, frozen, or vacuum leakage.</li> <li>• Is there any malfunction?</li> </ul>	Yes Replace vacuum hoses, then go to Step 8.
		No Go to the next step.
5	<b>INSPECT EGR VALVE MALFUNCTION</b> <ul style="list-style-type: none"> <li>• Inspect the EGR valve. (See <a href="#">EGR VALVE INSPECTION [LF]</a>.)</li> <li>• Is the EGR valve normal?</li> </ul>	Yes Go to the next step.
		No Replace the EGR valve, then go to Step 8. (See <a href="#">EGR VALVE REMOVAL/INSTALLATION [LF]</a> .)
6	<b>INSPECT MAP SENSOR MALFUNCTION</b> <ul style="list-style-type: none"> <li>• Perform MAP sensor inspection. (See <a href="#">MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR INSPECTION [LF]</a>.)</li> <li>• Is EGR valve normal?</li> </ul>	Yes Go to the next step.
		No Replace MAP sensor, then go to Step 8. (See <a href="#">MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR REMOVAL/INSTALLATION [LF]</a> .)
7	<b>INSPECT EGR VALVE PASSAGE</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Remove the EGR valve.</li> <li>• Is gasket installation normal?</li> </ul>	Yes Go to the next step.
		No Install gasket correctly, then go to the next step.
8	<b>MONITOR EGR SYSTEM BY DRIVE MODE</b> <ul style="list-style-type: none"> <li>• Clear DTC from PCM memory using M-MDS.</li> <li>• Run PCM Adaptive Memory Procedure Drive Mode. (See <a href="#">OBD-II DRIVE MODE [LF]</a>.)</li> <li>• Stop vehicle and access ON BOARD READINESS TEST to</li> </ul>	Yes Go to the next step.
		No Retry this step.

	<p>inspect DRIVE MODE completion status.</p> <ul style="list-style-type: none"><li>• Verify FUEL_EVAL and EGR_EVAL PIDs status.</li><li>• Does FUEL_EVAL and EGR_EVAL PIDs change to Yes?</li></ul>		
9	<p><b>VERIFY TROUBLESHOOTING OF DTC P0401 COMPLETED</b></p> <ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Access DIAGNOSTIC MONITORING TEST RESULTS.</li></ul> <p>(See <b>ON-BOARD DIAGNOSTIC TEST [LF]</b>.)</p> <ul style="list-style-type: none"><li>• Verify TEST #10:31:83 (EGR pressure variation) value.</li><li>• Is value within the specification?</li></ul>	Yes	Go to the next step.
		No	Replace the PCM, then go to the next step. (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)
10	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"><li>• Perform "AFTER REPAIR PROCEDURE".</li></ul> <p>(See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</p> <ul style="list-style-type: none"><li>• Is there any DTC present?</li></ul>	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.

2008 - MX-5 - Engine

DTC P0126, P0128 [LF]

DTC P0126 DTC P0128	Coolant thermostat stuck open
DETECTION CONDITION	<p><b>DTC P0126</b></p> <ul style="list-style-type: none"><li>If the ECT sensor signal never exceeds <b>71 °C {160 °F}</b> after engine start for specified period, PCM determines that the coolant thermostat is stuck open.</li></ul> <p><b>MONITORING CONDITIONS</b></p> <ul style="list-style-type: none"><li>IAT: <b>above –10 °C {14 °F}</b></li><li>Vehicle speed: <b>over 6 km/h {3.7 mph}</b></li></ul> <p><b>DTC P0128</b></p> <ul style="list-style-type: none"><li>PCM monitors MAF, IAT, VSS and EAT signals and calculate radiator’s heat radiation ratio while following monitoring conditions are met. If calculated value exceeds threshold, PCM determines that the coolant thermostat is stuck open.</li></ul> <p><b>MONITORING CONDITIONS</b></p> <ul style="list-style-type: none"><li>IAT: <b>above –10°C {14 °F}</b></li><li>ECT at engine start: <b>Below 36 °C {97 °F}</b></li><li>Difference between ECT at engine start and minimum IAT: <b>Below 6 °C {10.8 °F}</b></li><li>Vehicle speed: <b>over 30 km/h {18.6 mph}</b></li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>This is an intermittent monitor (Engine cooling system).</li><li>The MIL illuminates if the PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in PCM.</li><li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li><li>FREEZE FRAME DATA is available.</li><li>The DTC is stored in the PCM memory.</li></ul>

	<ul style="list-style-type: none"> <li>• DIAGNOSTIC MONITORING TEST RESULT is available.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• ECT sensor malfunction</li> <li>• Coolant thermostat malfunction</li> <li>• PCM malfunction</li> </ul>

## Diagnostic procedure

STEP	INSPECTION		ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b> <ul style="list-style-type: none"> <li>• Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (Engine cooling system related) been recorded?</li> </ul>	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>• Verify related Service Bulletins and/or on-line repair information availability.</li> <li>• Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>• If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<b>INSPECT FOR OTHER DTCS</b> <ul style="list-style-type: none"> <li>• Have other DTCs been stored?</li> </ul>	Yes	Repair circuit malfunction for applicable DTCs.
		No	Go to the next step.
4	<b>INSPECT COOLANT THERMOSTAT FOR WHETHER STUCK OPEN</b> <ul style="list-style-type: none"> <li>• Perform the coolant thermostat inspection. (See <a href="#">THERMOSTAT INSPECTION [LF].</a>)</li> <li>• Is the coolant thermostat normal?</li> </ul>	Yes	Inspect the ECT sensor.  Replace the ECT sensor if necessary, then go to the next step.  (See <a href="#">ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [LF].</a> )
		No	Replace the coolant



		thermostat, then go to the next step.  (See <b>THERMOSTAT REMOVAL/INSTALLATION [LF].</b> )
5	<b>VERIFY MONITORING CONDITION FOR REPAIR VERIFICATION</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Cool down engine.</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• If workshop inside and outside temperature difference is significant, PCM might not operate thermostat monitor. Therefore, it is recommended to  cool down engine out of workshop.</li> <li>• Turn the ignition switch to the ON position (Engine off).</li> <li>• Clear DTC from PCM memory using M-MDS.</li> <li>• Access ECT, IAT PIDs and make sure that each value is within following specifications. <ul style="list-style-type: none"> <li>▪ ECT: <b>below 36 °C {97 °F}</b> (for P0128 only)</li> <li>▪ Difference between ECT and IAT: <b>Below 6 °C {10.8 °F}</b></li> </ul> </li> <li>• Is there any PID that is out of specification?</li> </ul>	<div>Yes Take corrective action (e.g. cool down engine), then repeat this step.</div> <div>No Go to the next step for DTC P0126 or go to Step 7 for DTC P0128.</div>
6	<b>VERIFY TROUBLESHOOTING OF DTC P0126 COMPLETED</b> <ul style="list-style-type: none"> <li>• Start the engine and turn off E/L and A/C.</li> <li>• Access DIAGNOSTIC MONITORING TEST RESULTS using M-MDS and monitor TEST #10:E1:81 (ECT).</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• This test requires actual driving. Chassis roller cannot be used for this test.</li> <li>• During test drive, constant speed should be maintained, although 2 or 3 stops during every <b>5 minutes</b> of driving time (e.g. for traffic signals) is acceptable. Stop-and-go (e.g. in case of traffic congestion) is not acceptable during the test period.</li> </ul>	<div>Yes Go to Step 8.</div> <div>No Replace the PCM, then go to Step 8.  (See <b>PCM REMOVAL/INSTALLATION [LF].</b>)</div>

	<p>Test period depends on ECT at engine start. (e.g. if ECT is <b>-10 °C {14 °F}</b>, monitoring period is <b>20 minutes</b> and ECT is <b>30 °C {86 °F}</b>, monitoring period is <b>8 minutes</b>)</p> <ul style="list-style-type: none"> <li>• Verify TEST #10:E1:81 (ECT) value.</li> <li>• Is value above minimum value?</li> </ul>		
7	<p><b>VERIFY TROUBLESHOOTING OF DTC P0128 COMPLETED</b></p> <ul style="list-style-type: none"> <li>• Start the engine and turn off E/L and A/C.</li> <li>• Access DIAGNOSTIC MONITORING TEST RESULTS using M-MDS and monitor TEST #10:E1:80 (Heat radiation ratio) or #10:E1:81 (ECT).</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• This test requires actual driving. Chassis roller cannot be used for this test.</li> <li>• During test drive, constant speed should be maintained, although 2 or 3 stops (e.g. for traffic signals) is acceptable. Stop-and-go (e.g. in case of traffic congestion) is not acceptable during the test period.</li> <li>• Verify TEST #10:E1:80 (Heat radiation ratio) and #10:E1:81 (ECT) value.</li> <li>• Are value of TEST #10:E1:80 (Heat radiation ratio) below maximum value and value of TEST #10:E1:81 (ECT) above minimum value?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Replace the PCM, then go to the next step.</p> <p>(See <b>PCM REMOVAL/INSTALLATION [LF]</b>.)</p>	
8	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"> <li>• Perform the "AFTER REPAIR PROCEDURE".</li> </ul> <p>(See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</p> <ul style="list-style-type: none"> <li>• Are any DTCs present?</li> </ul>	<p>Yes Go to the applicable DTC inspection.</p> <p>(See <b>DTC TABLE [LF]</b>.)</p> <p>No Troubleshooting completed.</p>	

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### DTC P1260 [LF]

DTC P1260	Immobilizer system problem
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The instrument cluster detects an immobilizer system malfunction.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (Other).</li> <li>The MIL does not illuminate.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition.</li> <li>FREEZE FRAME DATA is not available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Immobilizer system malfunction</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
2	<b>VERIFY STORED DTC IN INSTRUMENT CLUSTER</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Verify stored DTCs in instrument cluster.</li> </ul> <p>(See <a href="#">DTC INSPECTION [IMMOBILIZER</a></p>	Yes Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [IMMOBILIZER SYSTEM (ADVANCED KEYLESS SYSTEM)]</a> .) (See <a href="#">DTC TABLE [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]</a> .)

	<p><b>SYSTEM (ADVANCED KEYLESS SYSTEM)]</b>.)</p> <p>(See <b>DTC INSPECTION [IMMOBILIZER SYSTEM (KEYLESS ENTRY SYSTEM)]</b>.)</p> <ul style="list-style-type: none"><li>• Are DTCs stored?</li></ul>	No	Go to the next step.
3	<p><b>VERIFY TROUBLESHOOTING OF DTC P1260 COMPLETED</b></p> <ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Clear the DTC from the PCM memory using the M-MDS.</li><li>• Start the engine, or perform the KOEO self-test with M-MDS.</li></ul> <p>(See <b>KOEO/KOER SELF TEST [LF]</b>.)</p> <ul style="list-style-type: none"><li>• Is the same DTC present?</li></ul>	Yes	Replace the PCM, then go to the next step.  (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)
		No	Go to the next step.
4	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"><li>• Perform the "AFTER REPAIR PROCEDURE".</li></ul> <p>(See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</p> <ul style="list-style-type: none"><li>• Is any DTC present?</li></ul>	Yes	Go to the applicable DTC inspection.  (See <b>DTC TABLE [LF]</b> .)
		No	DTC troubleshooting completed.

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### DTC B1342 [LF]

DTC B1342	<b>PCM malfunction</b>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"><li>Malfunction in the PCM internal circuit.</li></ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"><li>PCM internal malfunction</li></ul>

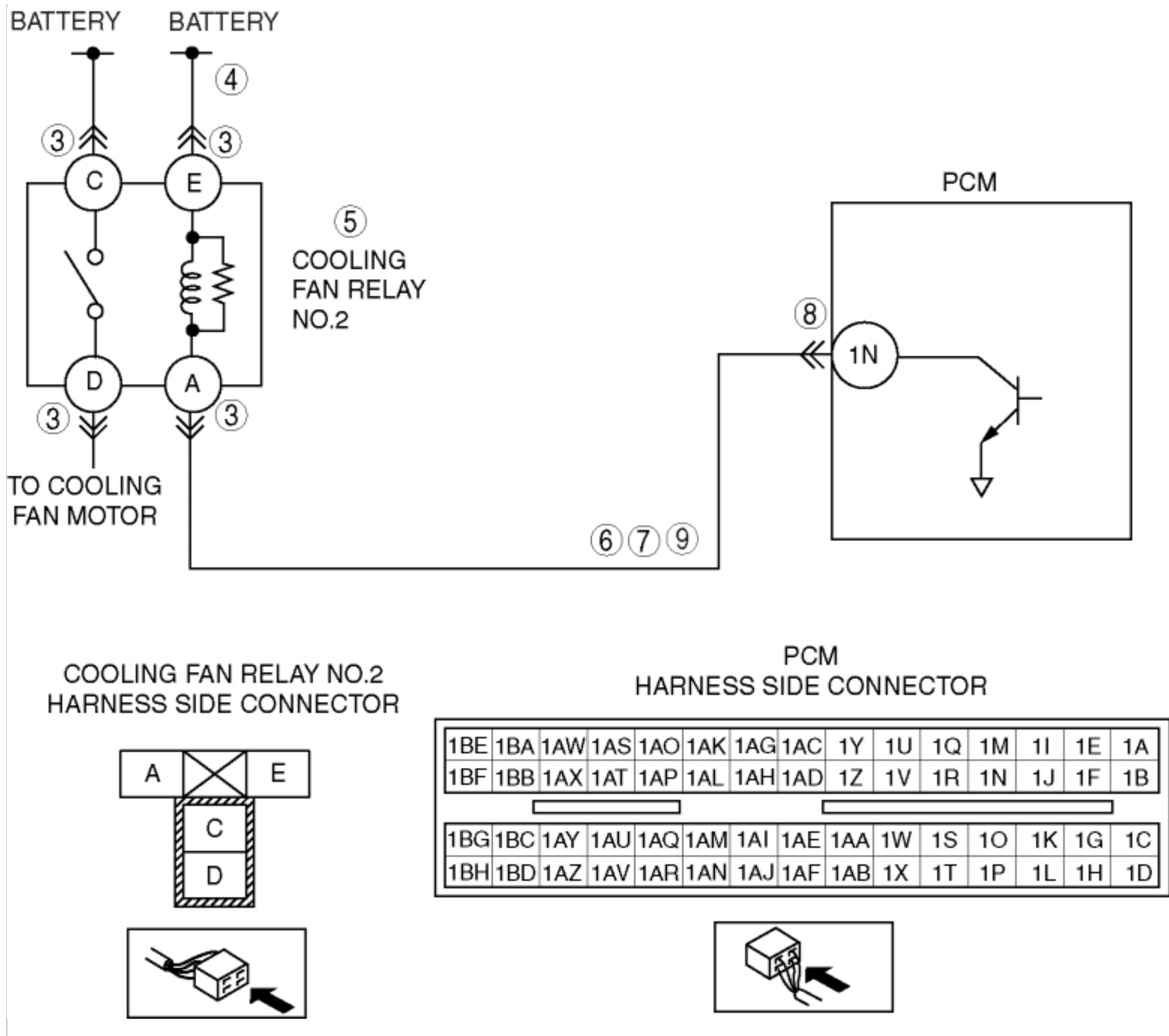
### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY CURRENT STATUS OF MALFUNCTION</b> <ul style="list-style-type: none"><li>Clear the DTC from the PCM memory using the M-MDS.</li><li>Is same DTC present?</li></ul>	Yes Replace the PCM, then go to the next step.  (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No Go to the next step.
2	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>Perform the "AFTER REPAIR PROCEDURE". (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</li><li>Are any DTC present?</li></ul>	Yes Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .)
		No Troubleshooting completed.

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### DTC P0481 [LF]

DTC P0481	Cooling fan relay No.2 control circuit malfunction
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors the cooling fan relay No.2 control signal voltage and current. If the following conditions are met, the PCM determines that there is the cooling fan relay No.2 control circuit problem.<ul style="list-style-type: none"><li>▪ The PCM turns the cooling fan relay No.2 off, but the voltage of the cooling fan relay No.2 control signal remains low.</li><li>▪ The PCM turns the cooling fan relay No.2 on, but the current of the cooling fan relay No.2 control signal remains high.</li></ul></li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (Other).</li><li>• The MIL does not illuminate.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Cooling fan relay No.2 malfunction</li><li>• Connector or terminal malfunction</li><li>• Open circuit in wiring harness between battery positive terminal and cooling fan relay No.2 terminal E</li><li>• Open circuit in wiring harness between cooling fan relay No.2 terminal A and PCM terminal 1N</li><li>• Short to ground in wiring harness between cooling fan relay No.2 terminal A and PCM terminal 1N</li><li>• Short to power supply between cooling fan relay No.2 terminal A and PCM terminal 1N</li><li>• PCM malfunction</li></ul>



### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> </ul>	Yes Perform repair or diagnosis according to the available repair information.

	<ul style="list-style-type: none"> <li>Is any related repair information available?</li> </ul>		<ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<b>INSPECT COOLING FAN RELAY NO.2 CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition switch to off.</li> <li>Disconnect cooling fan relay No.2 connector.</li> <li>Inspect for poor connection (such as damaged, pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace terminal and/or connector, then go to Step 10.
		No	Go to next step.
4	<b>INSPECT COOLING FAN RELAY NO.2 POWER CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn ignition switch to ON (Engine OFF).</li> <li>Measure voltage between cooling fan relay No.2 terminal E (wiring harness side) and body ground.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes	Go to next step.
		No	Replace or replace harness for open circuit, then go to Step 10.
5	<b>INSPECT COOLING FAN RELAY NO.2</b> <ul style="list-style-type: none"> <li>Inspect cooling fan relay No.2. (See <a href="#">RELAY INSPECTION</a>.)</li> <li>Are cooling fan relay No.2 okay?</li> </ul>	Yes	Go to next step.
		No	Replace cooling fan relay No.2, then go to Step 10.
6	<b>INSPECT COOLING FAN RELAY NO.2 CONTROL CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>Measure voltage between cooling fan relay No.2 terminal A (wiring harness side) and body ground.</li> <li>Is voltage <b>B+</b>?</li> </ul>	Yes	Repair or replace harness for short to power supply, then go to Step 10.
		No	Go to next step.
7	<b>INSPECT COOLING FAN RELAY NO.2 CONTROL CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>Inspect continuity between cooling fan relay No.2 terminal A (wiring harness side) and body ground.</li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace harness for open circuit, then go to Step 10.
		No	Go to next step.
8	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn ignition switch to OFF.</li> </ul>	Yes	Repair or replace terminal and/or connector, then go to Step 10.



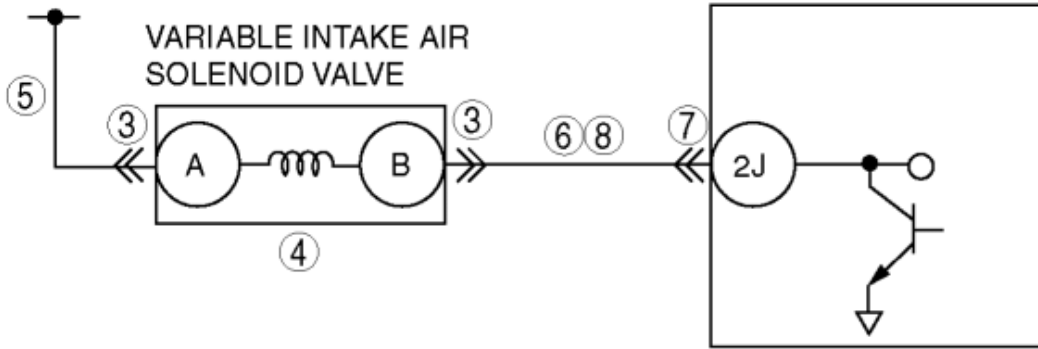
	<p>Disconnect PCM connector.</p> <ul style="list-style-type: none"> <li>Inspect for poor connection (such as damaged, pulled-out pins, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>		No	Go to next step.
9	<p><b>INSPECT COOLING FAN RELAY NO.2 CONTROL CIRCUIT FOR OPEN CIRCUIT</b></p> <ul style="list-style-type: none"> <li>Inspect continuity between cooling fan relay No.2 terminal A (wiring harness side) and PCM terminal 1N (wiring harness side).</li> <li>Is there continuity?</li> </ul>		Yes	Go to next step.
			No	Repair or replace harness for open circuit, then go to next step.
10	<p><b>VERIFY TROUBLESHOOTING OF DTC P0481 COMPLETED</b></p> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear DTC from PCM memory using M-MDS.</li> <li>Perform the KOEO self-test with M-MDS, or following procedures.</li> </ul> <p>(See <a href="#">KOEO/KOER SELF TEST [LF]</a>.)</p> <ul style="list-style-type: none"> <li>Turn ignition switch to off.</li> <li>Start engine and turn on A/C switch and fan switch.</li> <li>Retrieve any DTC.</li> <li>Is PENDING CODE for this DTC present?</li> </ul>		Yes	<p>Replace PCM, then go to next step.</p> <p>(See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a>.)</p>
			No	Go to next step.
11	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"> <li>Perform "After Repair Procedure".</li> </ul> <p>(See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</p> <ul style="list-style-type: none"> <li>Is any DTC present?</li> </ul>		Yes	<p>Go to applicable DTC inspection.</p> <p>(See <a href="#">DTC TABLE [LF]</a>.)</p>
			No	Troubleshooting completed.

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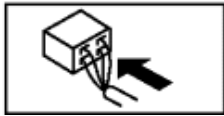
DTC P0661 [LF]

DTC P0661	Variable intake air solenoid valve circuit low input
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors the variable intake air solenoid valve control signal. If the PCM turns variable intake air solenoid valve off but voltage at PCM terminal still remains low, the PCM determines that variable intake air solenoid valve circuit has malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (Other).</li><li>• The MIL does not illuminate.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition.</li><li>• The FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Variable intake air solenoid valve malfunction</li><li>• Open circuit in wiring harness between main relay and variable intake air solenoid valve terminal A</li><li>• Open circuit in wiring harness between variable intake air solenoid valve terminal B and PCM terminal 2J</li><li>• Short to ground in wiring harness between variable intake air solenoid valve terminal B and PCM terminal 2J</li><li>• Connector or terminal malfunction</li><li>• PCM malfunction</li></ul>

MAIN RELAY

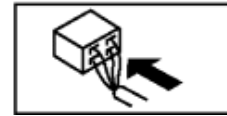


VARIABLE INTAKE AIR SOLENOID VALVE  
WIRING HARNESS-SIDE CONNECTOR



PCM  
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>INSPECT VARIABLE INTAKE AIR SOLENOID VALVE CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the variable intake air solenoid valve connector.</li> <li>Inspect for poor connection (damaged/pulled-out pins, corrosion, etc.).</li> </ul>	Yes Repair or replace the terminal, then go to Step 9.
		No Go to the next step.

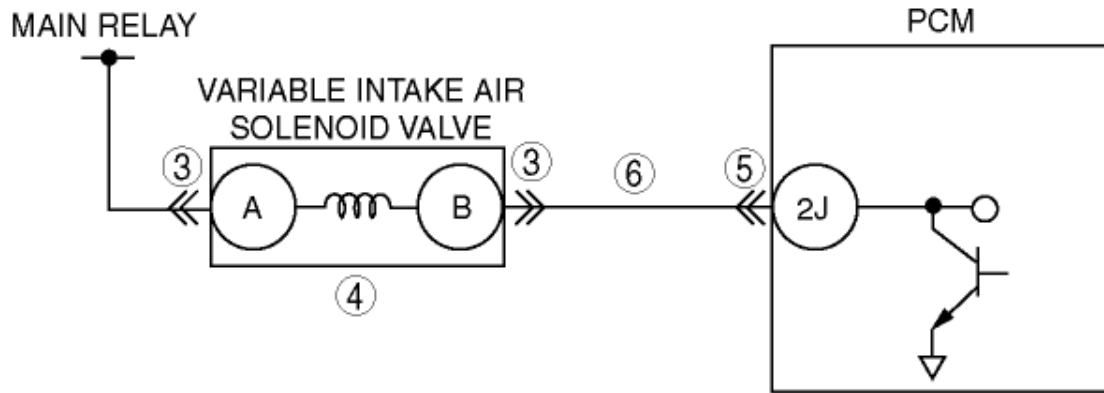
	<ul style="list-style-type: none"> <li>Is there malfunction?</li> </ul>		
4	<b>INSPECT VARIABLE INTAKE AIR SOLENOID VALVE MALFUNCTION</b> <ul style="list-style-type: none"> <li>Inspect the variable intake air solenoid valve. (See <a href="#">VARIABLE INTAKE AIR SOLENOID VALVE INSPECTION [LF].</a>)</li> <li>Is the variable intake air solenoid valve normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the variable intake air solenoid valve, then go to Step 9.  (See <a href="#">VARIABLE INTAKE AIR SOLENOID VALVE REMOVAL/INSTALLATION [LF].</a> )
5	<b>INSPECT VARIABLE INTAKE AIR SOLENOID VALVE POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Measure the voltage between variable intake air solenoid valve terminal A (wiring harness-side) and body ground.</li> <li>Is the voltage <b>B+</b>?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open, then go to Step 9.
6	<b>INSPECT VARIABLE INTAKE AIR SOLENOID VALVE CONTROL CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>Inspect for continuity between variable intake air solenoid valve terminal B (wiring harness-side) and body ground.</li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness for short to ground, then go to Step 9.
		No	Go to the next step.
7	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Disconnect the PCM connector.</li> <li>Inspect for poor connection at terminal 2J. (damaged/pulled-out pins, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair the terminal, then go to Step 9.
		No	Go to the next step.
8	<b>INSPECT VARIABLE INTAKE AIR SOLENOID VALVE CONTROL CIRCUIT FOR OPEN</b> <ul style="list-style-type: none"> <li>Inspect for continuity between variable intake air solenoid valve terminal B (wiring harness-side) and PCM terminal 2J (wiring harness-side).</li> <li>Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to the next step.
9	<b>VERIFY TROUBLESHOOTING OF DTC P0661 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Perform the following procedures, or KOEO self-test with M-MDS. (See <a href="#">KOEO/KOER SELF TEST [LF].</a>)               <ul style="list-style-type: none"> <li>Access RPM PID.</li> <li>Increase the engine speed <b>4,750 rpm</b></li> </ul> </li> </ul>	Yes	Replace the PCM, then go to the next step.  (See <a href="#">PCM REMOVAL/INSTALLATION [LF].</a> )
		No	Go to the next step.

	<p><b>or more for 10 times.</b></p> <ul style="list-style-type: none"> <li>Is the same DTC present?</li> </ul>		
10	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"> <li>Perform the "AFTER REPAIR PROCEDURE". (See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to the applicable DTC troubleshooting. (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.

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DTC P0662 [LF]

DTC P0662	Variable intake air solenoid valve circuit high input
DETECTION CONDITION	<ul style="list-style-type: none"><li>• The PCM monitors the variable intake air solenoid valve control signal at PCM terminal. If the PCM turns variable intake air solenoid valve on but voltage at PCM terminal still remains high, the PCM determines that the variable intake air solenoid valve circuit has malfunction.</li></ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"><li>• This is a continuous monitor (Other).</li><li>• The MIL does not illuminate.</li><li>• PENDING CODE is available if the PCM detects the above malfunction condition.</li><li>• FREEZE FRAME DATA is available.</li><li>• The DTC is stored in the PCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Variable intake air solenoid valve malfunction</li><li>• Short to power supply in wiring harness between variable intake air solenoid valve terminal B and PCM terminal 2J</li><li>• Shorted variable intake air solenoid valve or PCM connector</li><li>• PCM malfunction</li></ul>

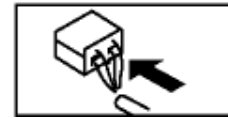


VARIABLE INTAKE AIR SOLENOID VALVE  
WIRING HARNESS-SIDE CONNECTOR



PCM  
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.  No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> No Go to the next step.
3	<b>INSPECT VARIABLE INTAKE AIR SOLENOID VALVE CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the variable intake air solenoid valve connector.</li> <li>Inspect for poor connection (damaged/pulled-out pins, corrosion, etc.).</li> <li>Is there any malfunction?</li> </ul>	Yes Repair or replace the terminal, then go to Step 7.  No Go to the next step.

4	<b>INSPECT VARIABLE INTAKE AIR SOLENOID VALVE MALFUNCTION</b> <ul style="list-style-type: none"> <li>Inspect the variable intake air solenoid valve. (See <b>VARIABLE INTAKE AIR SOLENOID VALVE INSPECTION [LF]</b>.)</li> <li>Is the variable intake air solenoid valve normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the variable intake air solenoid valve, then go to Step 7.  (See <b>VARIABLE INTAKE AIR SOLENOID VALVE REMOVAL/INSTALLATION [LF]</b> .)
5	<b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the PCM connector.</li> <li>Inspect for poor connection at terminal 2J. (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair the terminal, then go to Step 7.
		No	Go to the next step.
6	<b>INSPECT VARIABLE INTAKE AIR SOLENOID VALVE CONTROL CIRCUIT SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Measure the voltage between variable intake air solenoid valve terminal B (wiring harness-side) and body ground.</li> <li>Is the voltage <b>B+</b>?</li> </ul>	Yes	Repair or replace the wiring harness for short to power supply, then go to the next step.
		No	Go to the next step.
7	<b>VERIFY TROUBLESHOOTING OF DTC P0662 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Turn the ignition switch to the ON position (Engine off).</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Perform the following procedures, or KOEO self-test with M-MDS. (See <b>KOEO/KOER SELF TEST [LF]</b>.) <ul style="list-style-type: none"> <li>Access RPM PID.</li> <li>Increase the engine speed <b>4,750 rpm or more</b> for <b>10 times</b>.</li> </ul> </li> <li>Is the same DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step.  (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)
		No	Go to the next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the "AFTER REPAIR PROCEDURE". (See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</li> <li>Are any DTC present?</li> </ul>	Yes	Go to the applicable DTC troubleshooting.  (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.





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### DTC P0130 [LF]

DTC P0130	Front HO2S circuit problem
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors the front HO2S impedance when under the front HO2S heater control. If the impedance is <b>more than 500 ohms</b>, the PCM determines that there is a front HO2S circuit problem.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (HO2S).</li> <li>The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Front HO2S malfunction</li> <li>Connector or terminal malfunction</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA AND DIAGNOSTIC MONITORING TEST RESULTS HAVE BEEN RECORDED</b>	YesGo to the next step.
	<ul style="list-style-type: none"> <li>Have FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS (HO2S related) been recorded?</li> </ul>	NoRecord the FREEZE FRAME DATA and DIAGNOSTIC MONITORING TEST RESULTS on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or</li> </ul>	YesPerform repair or diagnosis according to the available repair information.

	<p>on-line repair information availability.</p> <ul style="list-style-type: none"> <li>Is any related repair information available?</li> </ul>		<ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<p><b>INSPECT FRONT HO2S CONNECTOR FOR POOR CONNECTION</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the front HO2S connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 6.
		No	Go to the next step.
4	<p><b>INSPECT PCM CONNECTOR FOR POOR CONNECTION</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect the PCM connector.</li> <li>Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the terminal, then go to Step 6.
		No	Go to the next step.
5	<p><b>INSPECT FRONT HO2S</b></p> <ul style="list-style-type: none"> <li>Inspect the front HO2S.</li> </ul> <p>(See <b>FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF].</b>)</p> <ul style="list-style-type: none"> <li>Is there any malfunction?</li> </ul>	Yes	<p>Replace the front HO2S, then go to the next step.</p> <p>(See <b>FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF].</b>)</p>
		No	Go to the next step.
6	<p><b>VERIFY TROUBLESHOOTING OF DTC P0130 COMPLETED</b></p> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Perform the KOEO self-test (using M-MDS) or the HO2S heater, HO2S, and TWC Repair Verification Drive Mode (not using M-MDS).</li> </ul> <p>(See <b>KOEO/KOER SELF TEST [LF].</b>)</p> <p>(See <b>OBD-II DRIVE MODE [LF].</b>)</p> <ul style="list-style-type: none"> <li>Is the PENDING CODE for this DTC present?</li> </ul>	Yes	<p>Replace the PCM, then go to the next step.</p> <p>(See <b>PCM REMOVAL/INSTALLATION [LF].</b>)</p>
		No	Go to the next step.

7	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the “AFTER REPAIR PROCEDURE”.</li></ul> (See <b>AFTER REPAIR PROCEDURE [LF]</b> .) <ul style="list-style-type: none"><li>• Are any DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	DTC troubleshooting completed.

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### DTC P2109 [LF]

DTC P2109	TP sensor minimum stop range/performance problem
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors the minimum TP when the closed TP learning is completed. If the TP is <b>less than 6.03%</b> or <b>more than 18.7%</b>, the PCM determines that there is a TP sensor minimum stop range/performance problem.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>PENDING CODE is available if the PCM detects the above malfunction conditions.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Throttle actuator malfunction</li> <li>Throttle valve malfunction</li> <li>PCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	YesGo to the next step.
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	NoRecord the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b>	YesPerform repair or diagnosis according to the available repair information.
	<ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> </ul>	<ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next</li> </ul>

	<ul style="list-style-type: none"> <li>Is any related repair information available?</li> </ul>		step.
		No	Go to the next step.
3	<b>INSPECT THROTTLE ACTUATOR</b> <ul style="list-style-type: none"> <li>Inspect the throttle actuator. (See <b>THROTTLE BODY INSPECTION [LF]</b>.)</li> <li>Is there any malfunction?</li> </ul>	Yes	Replace the throttle body, then go to Step 5.  (See <b>INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [LF]</b> .)
		No	Go to the next step.
4	<b>INSPECT THROTTLE VALVE</b> <ul style="list-style-type: none"> <li>Inspect the throttle valve. (See <b>THROTTLE BODY INSPECTION [LF]</b>.)</li> <li>Is there any malfunction?</li> </ul>	Yes	Replace the throttle body, then go to the next step.  (See <b>INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [LF]</b> .)
		No	Go to the next step.
5	<b>VERIFY TROUBLESHOOTING OF DTC P2109 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the PCM memory using the M-MDS.</li> <li>Start the engine.</li> <li>Is the same DTC present?</li> </ul>	Yes	Replace the PCM, then go to the next step.  (See <b>PCM REMOVAL/INSTALLATION [LF]</b> .)
		No	Go to the next step.
6	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the "AFTER REPAIR PROCEDURE". (See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</li> <li>Is any DTC present?</li> </ul>	Yes	Go to the applicable DTC inspection.  (See <b>DTC TABLE [LF]</b> .)
		No	DTC troubleshooting completed.

## 2008 - MX-5 - Engine

### DTC P2112 [LF]

DTC P2112	Throttle actuator control system range/performance problem
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The PCM monitors the throttle actuator control duty ratio when the engine is running. If the duty ratio is <b>more than 95%</b>, the PCM determines that there is a throttle actuator control system range/performance problem.</li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is a continuous monitor (CCM).</li> <li>The MIL illuminates if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>PENDING CODE is available if the PCM detects the above malfunction conditions.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Throttle actuator control module malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.

3	<b>VERIFY TROUBLESHOOTING OF DTC P2112 COMPLETED</b> <ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Clear the DTC from the PCM memory using the M-MDS.</li><li>• Start the engine.</li><li>• Is the same DTC present?</li></ul>	Yes	Replace the PCM, then go to the next step. (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a> .)
		No	Go to the next step.
4	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "AFTER REPAIR PROCEDURE".  (See <a href="#">AFTER REPAIR PROCEDURE [LF]</a>.)</li><li>• Is any DTC present?</li></ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .)
		No	DTC troubleshooting completed.



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### DTC P0442, P0455, P0456 [LF]

DTC P0442	P0442: EVAP system leak detected (small leak)
DTC P0455	P0455: EVAP system leak detected (gross leak/no flow)
DTC P0456	P0456: EVAP system leak detected (very small leak)
DETECTION CONDITION	<p><b>DTC P0455, DTC P0442, DTC P0456</b></p> <ul style="list-style-type: none"> <li>The PCM measures the pump load current (EVAP line pressure) after a specified period has elapsed since the EVAP system is sealed when monitoring conditions are met. If the load does not reach the reference load value, or the rate of the load increase is lower than the specification within a specified period, the PCM determines that the EVAP system has a very small leak.</li> </ul> <p><b>MONITORING CONDITION</b></p> <ul style="list-style-type: none"> <li>The ignition switch is turned off.</li> <li>IAT: <b>5—35 °C {41—95 °F}</b></li> <li>Battery voltage: <b>10.9 V or above</b></li> <li>Atmospheric pressure: <b>72.2 kPa {542 mmHg, 21.3 inHg} or above</b></li> <li>Fuel tank level: <b>15—85%</b></li> <li>Time from engine off: <b>5 h or more.</b></li> </ul> <p><b>Diagnostic support note</b></p> <ul style="list-style-type: none"> <li>This is an intermittent monitor (Evaporative system).</li> <li>The MIL illuminates if the PCM detects above malfunction condition in two consecutive drive cycles or in one drive cycle while the DTC for the same malfunction has been stored in the PCM.</li> <li>PENDING CODE is available if the PCM detects the above malfunction condition during the first drive cycle.</li> <li>FREEZE FRAME DATA is available.</li> <li>The DTC is stored in the PCM memory.</li> <li>DIAGNOSTIC MONITORING TEST RESULT is available.</li> </ul>
	<p><b>DTC P0442, P0456</b></p> <ul style="list-style-type: none"> <li>After-market EVAP hardware (such as fuel-filler cap) not conforming to required</li> </ul>

**POSSIBLE  
CAUSE**

specifications.

- Small holes or cuts in fuel vapor hoses/tubes (P0442, P0456).
- Change over valve stays partially open on closed command.
- Damaged, cross-threaded or loosely installed fuel-filler cap.
- EVAP system component seals leaking.
- Purge solenoid leaking

**DTC P0455**

- After-market EVAP hardware (such as fuel-filler cap) not conforming to required specifications.
- Disconnected or cracked change over valve, purge solenoid valve outlet tube, or EVAP return tube.
- Loose, malfunctioning, damaged or missing fuel-filler cap.
- Loose fuel vapor hose/tube connections to EVAP system components.
- Change over valve stuck open.
- Damaged charcoal canister.

**Diagnostic procedure**

STEP	INSPECTION	ACTION	
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>• Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes	Go to the next step.
		No	Record FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>• Verify related Service Bulletins and/or on-line repair information availability.</li> <li>• Are any related Service Bulletins available?</li> </ul>	Yes	Perform repair or diagnosis according to the available Service Bulletins. <ul style="list-style-type: none"> <li>• If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<b>VERIFY RELATED PENDING CODE OR STORED DTCs</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch off then to the ON position (Engine off).</li> </ul>	Yes	Go to the appropriate DTC troubleshooting.

	<ul style="list-style-type: none"> <li>• Verify related pending code or stored DTCs.</li> <li>• Are any other DTCs present?</li> </ul>	(See <b>DTC TABLE [LF]</b> .)	
		No	Go to the next step.
4	<b>PRELIMINARY EVAP SYSTEM TEST</b> <ul style="list-style-type: none"> <li>• Perform the EVAP system leak inspection using the M-MDS.</li> <li>• Verify that all PIDs are within the following specifications:</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• To successfully perform this procedure, all PIDs must be within specification before proceeding to the next step. <ul style="list-style-type: none"> <li>▪ Select the following items from the initialization screen of the M-MDS.</li> <li>▪ Select "Powertrain".</li> <li>▪ Select "Fuel".</li> <li>▪ Select "EVAP Test".</li> <li>▪ Verify that ECT and IAT are within the specification on the confirmation screen. To successfully perform this procedure, ECT and IAT must be within the specification before proceeding to the next step.</li> <li>▪ The fuel level must be maintained within 15%—85%. The PCM will cancel the EVAP test If the fuel level is lower than 15% or higher than 85%.</li> <li>▪ Allow the M-MDS to run the EVAP test.</li> </ul> </li> <li>• Are DTCs besides P0455, P0442 or P0456 present?</li> </ul>	Yes	Go to the appropriate DTC troubleshooting.  (See <b>DTC TABLE [LF]</b> .)
		No	Go to the next step.
5	<b>VERIFY EVAP DTCs</b> <ul style="list-style-type: none"> <li>• Did the M-MDS EVAP test produce DTCs P0455, P0442 or P0456?</li> </ul>	Yes	Go to the next step.
		No	Go to Step 8.
6	<b>SECONDARY EVAP SYSTEM TEST</b> <ul style="list-style-type: none"> <li>• Tighten the fuel-filler cap then perform the EVAP system leak inspection using the M-MDS again.</li> <li>• Verify that all PIDs are within the following specifications:</li> </ul> <p><b>NOTE:</b></p>	Yes	Go to the next step.
		No	Fuel-filler cap was not properly tightened. Go to Step 11.

	<ul style="list-style-type: none"> <li>To successfully perform this procedure, all PIDs must be within the specification before proceeding to the next step. <ul style="list-style-type: none"> <li>Select the following items from the initialization screen of the M-MDS.</li> <li>Select "Powertrain".</li> <li>Select "Fuel".</li> <li>Select "EVAP Test".</li> <li>Verify that ECT and IAT are within the specification on the confirmation screen. To successfully perform this procedure, ECT and IAT must be within the specification before proceeding to the next step.</li> <li>The fuel level must be maintained within 15%—85%. The PCM will cancel the EVAP test If the fuel level is lower than 15% or higher than 85%.</li> <li>Allow the M-MDS to run the EVAP test.</li> </ul> </li> <li>Does the M-MDS still indicate that an EVAP system leak exists?</li> </ul>		
7	<b>VISUALLY INSPECT COMPONENTS FOR LEAKS</b> <ul style="list-style-type: none"> <li>Visually inspect for cut or loose connections to the fuel vapor hoses/tubes in the following locations: <ul style="list-style-type: none"> <li>Charcoal canister to EVAP leak detection pump.</li> <li>Charcoal canister to evaporative emission valve component.</li> <li>Evaporative emission valve component to the fuel tank (if applicable).</li> <li>Check for fuel-filler pipe damage.</li> </ul> </li> <li>Is a concern with a hose, tube, connection or valve visually evident?</li> </ul>	Yes	Repair or install a new component if necessary. Afterwards, verify that the leak is repaired by performing diagnostic Step 8.
		No	Go to the next step.
8	<b>CALIBRATE THE LEAK TESTER FOR DIAGNOSIS</b> <ul style="list-style-type: none"> <li>Verify that the control valve on the panel is in the HOLD position then open the nitrogen bottle valve.</li> <li>Connect the vehicle interface hose (part of the <b>SST</b>) to the SELF-TEST port located on the control panel. Hand tighten</li> </ul>	Yes	Go to the next step.
		No	Refer to the tester operator's manual for tester repair instructions

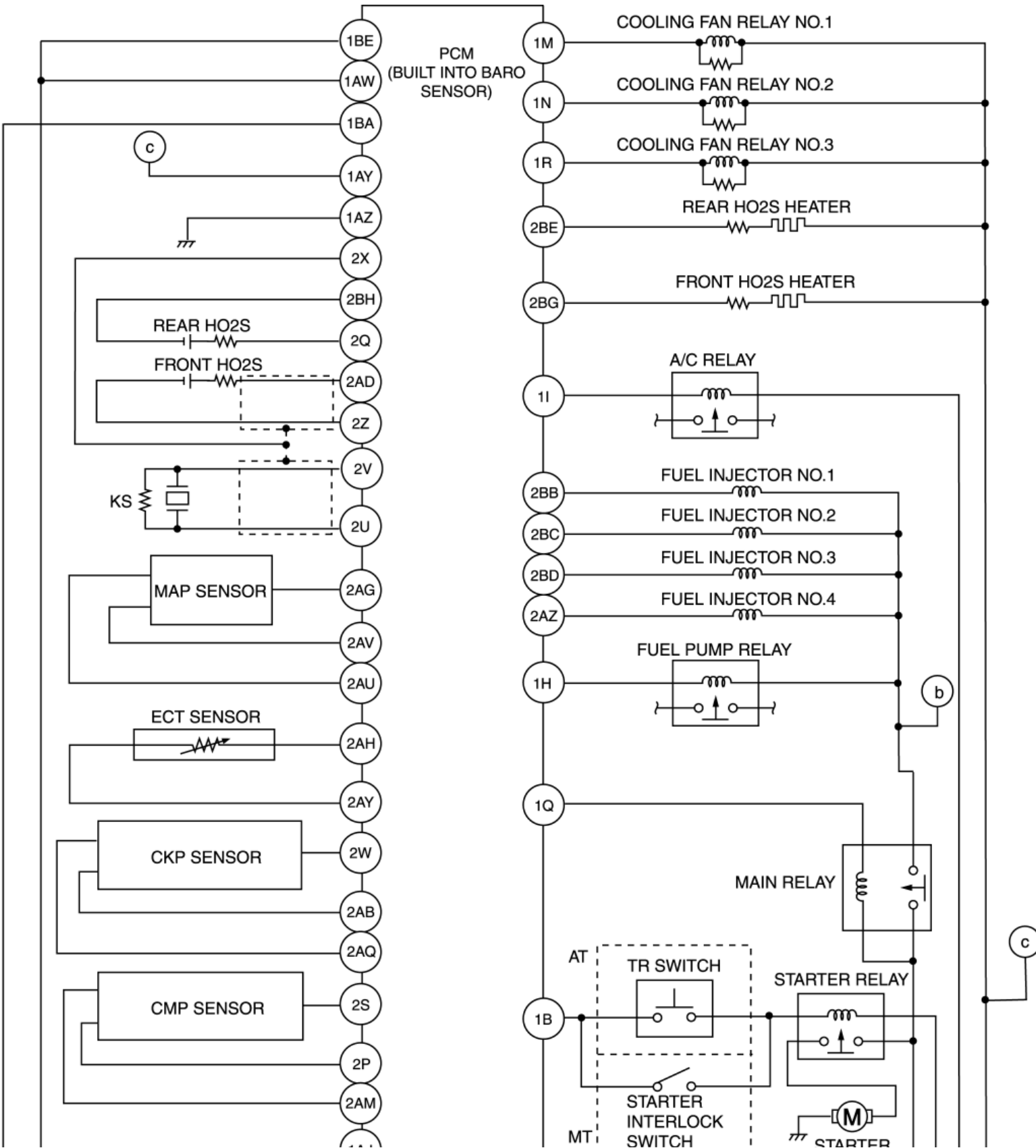
	<p>the fitting. (Do not overtighten.)</p> <ul style="list-style-type: none"><li>• Turn the control valve to the TEST position; the gauge should read 331—381 mm {13—15 in} of water.</li></ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"><li>• If the gauge is not reading in this range, adjust the pressure by turning the black knob on the low pressure regulator at the nitrogen bottle.</li><li>• After verifying the regulator is properly calibrated, turn the control valve to the HOLD position.</li><li>• Verify that the gauge holds pressure and that the flow meter reads no flow.</li><li>• Does the gauge hold pressure and the flow meter read no flow?</li></ul>		
9	<p><b>PRESSURIZE THE EVAP SYSTEM WITH NITROGEN</b></p> <ul style="list-style-type: none"><li>• Verify that the control valve on the panel is in the HOLD position.</li><li>• Remove the fuel-filler cap from the vehicle.<ul style="list-style-type: none"><li>• If the fuel-filler cap is not a MAZDA part or equivalent, replace it.</li></ul></li></ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"><li>• <b>INSPECT FUEL-FILLER CAP AND FILLER NECK</b><ul style="list-style-type: none"><li>▪ Visually inspect for damage, insufficient sealing, rust, cracks or warps for fuel-filler cap and fuel-filler neck</li><li>▪ Repair or replace if necessary</li></ul></li><li>• Connect the receiver assembly (<b>SST</b>: 134-01051) to the vehicle cap test hose assembly (part of the <b>SST</b>) and the fuel-filler cap from the vehicle.</li><li>• Connect the cap adaptor (<b>SST</b>: 134-01050) to the vehicle cap test hose assembly (part of the <b>SST</b>) and to the fuel-filler neck.</li><li>• Connect the vehicle interface hose (part of the <b>SST</b>) to the center fitting of the vehicle cap test hose assembly (part of</li></ul>	Yes	Disconnect the purge solenoid valve hose (to intake manifold side). Then go to the next step.
		No	Go to Step 11.

	<p>the <b>SST</b>).</p> <ul style="list-style-type: none"><li>• Connect M-MDS to the DLC-2.</li><li>• Turn the ignition switch to the ON position (Engine off)</li><li>• Request PCM on-board device control (Mode 08) using M-MDS to close the change over valve.</li></ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"><li>• The change over valve is closed for 10 min unless either of the following is done:<ul style="list-style-type: none"><li>▪ The engine is started.</li><li>▪ The ignition switch is turned to the off position</li></ul></li><li>• Verify the valve on the nitrogen bottle is still open.</li><li>• Turn the control valve to the open position and let the system fill. You should note a drop in the gauge pressure along with the flow meter being pegged at maximum flow for several minutes depending on how full or empty the fuel tank is, and how long it takes to completely fill and pressurize the evaporative emissions system hoses.</li><li>• Does the test indicate that a leak exists?</li></ul>		
10	<p><b>LOCATE LEAKAGE POINT</b></p> <ul style="list-style-type: none"><li>• Verify that the control valve on the panel is in the HOLD position and the valve on the nitrogen bottle is open.</li><li>• Connect the 12 volt power connector leads on the smoke generation unit to the vehicle's battery. Make sure to connect the red lead to the positive (+) terminal or power, and black lead to vehicle's chassis ground.</li><li>• Connect the M-MDS to the DLC-2.</li><li>• Turn the ignition switch to the ON position (Engine off)</li><li>• Request PCM on-board device control (Mode 08) using the M-MDS to close the change over valve.</li></ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"><li>• The change over valve is closed for 10 min unless either of the following occur:<ul style="list-style-type: none"><li>▪ The engine is started.</li><li>▪ The ignition switch is turned to the off position</li></ul></li><li>• Turn the control valve to the open position.</li></ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"><li>• NEVER depress the remote smoke trigger before opening the nitrogen tank valve and setting the tester control valve to TEST</li></ul>	Yes	Repair or install a new component if necessary. Go to the next step.
		No	Check all EVAP connections. Conduct diagnosis of intermittent concerns, then go to the next step

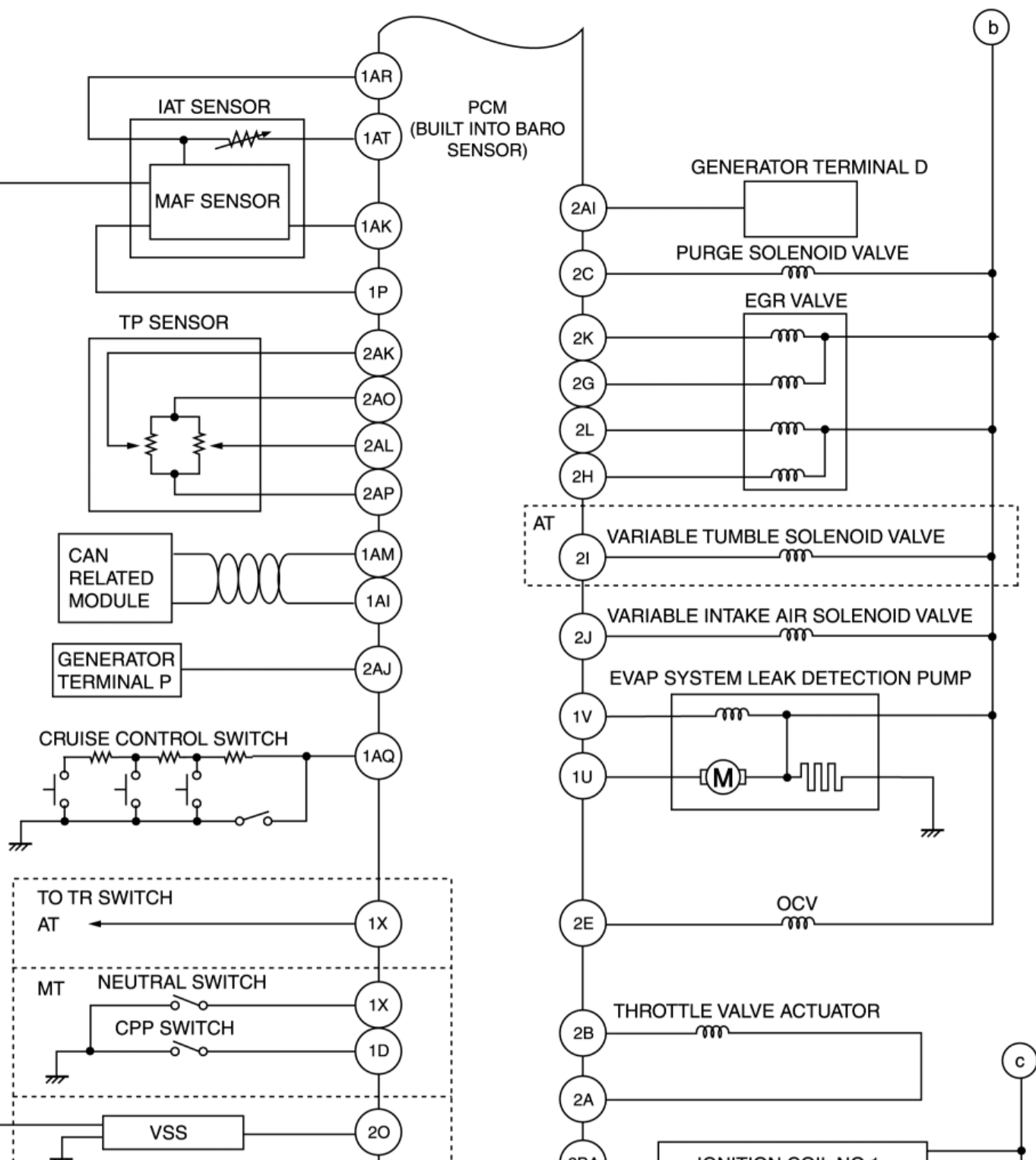
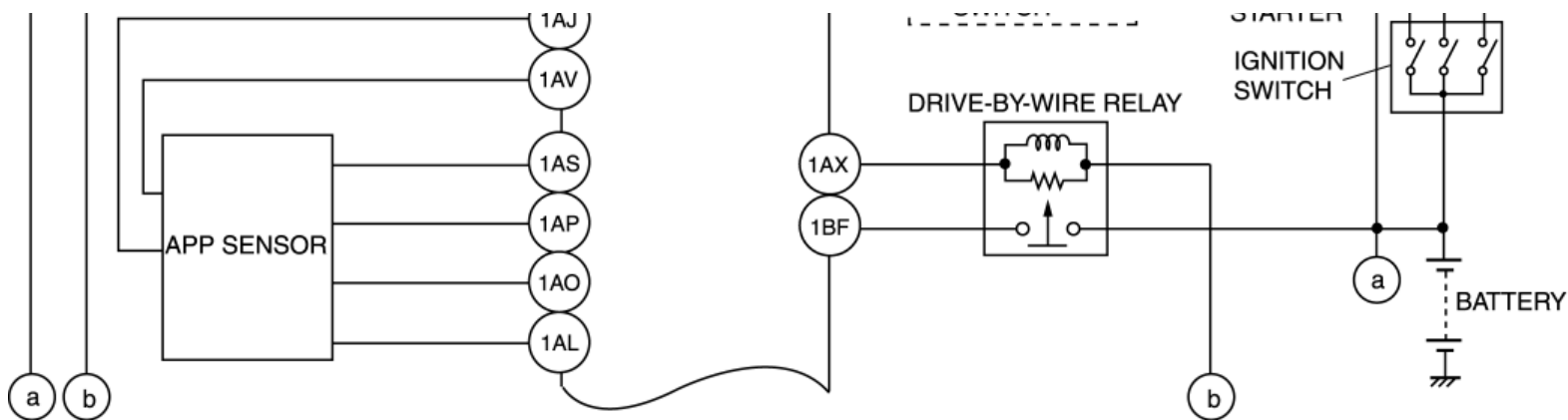
	<ul style="list-style-type: none"><li>• Press the remote smoke trigger on the smoke generation unit and let the system fill with smoke.</li></ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"><li>• It may be necessary to lift the vehicle to provide sufficient clearance underneath to conduct a proper visual inspection of the fuel and EVAP system.</li><li>• Use a 12-volt, 400,000 candle power spotlight (part # 4410000-100) or equivalent to help locate the smoke.</li><li>• Is a leak detected?</li></ul>		
11	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "AFTER REPAIR PROCEDURE". (See <b>AFTER REPAIR PROCEDURE [LF]</b>.)</li><li>• Are any DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection.  (See <b>DTC TABLE [LF]</b> .)
		No	Troubleshooting completed.

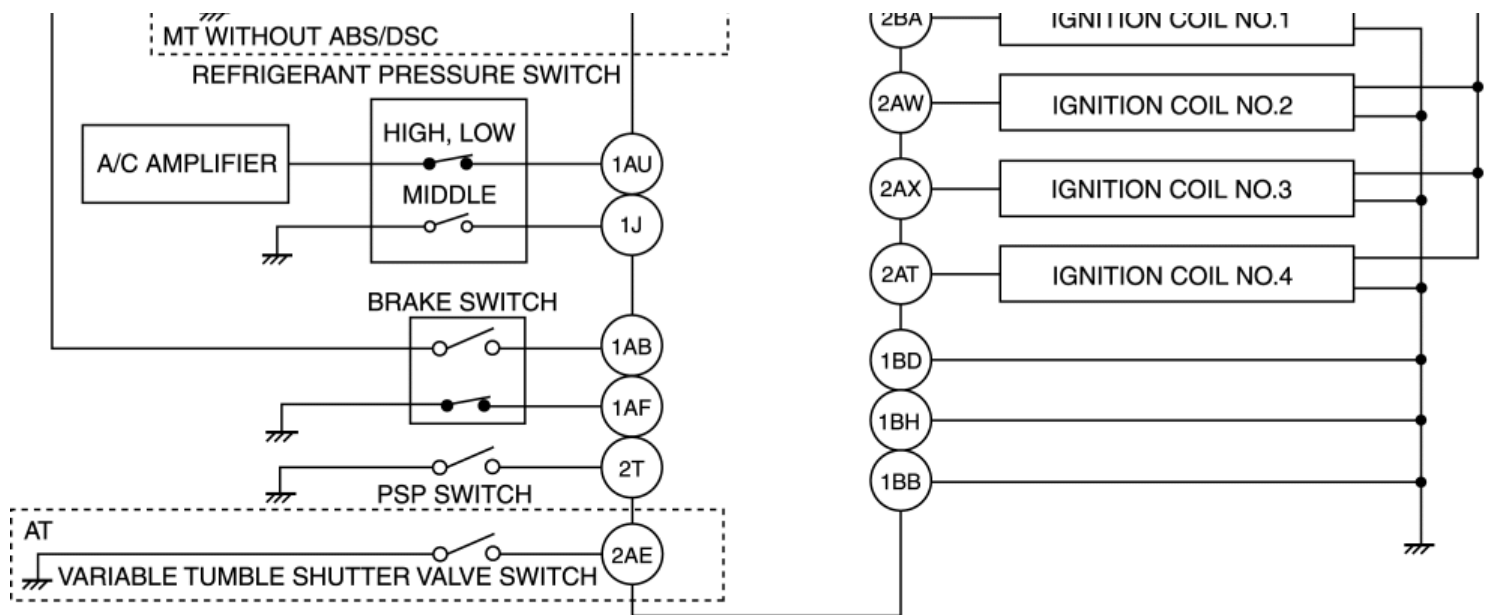
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SYMPTOM TROUBLESHOOTING WIRING DIAGRAM [LF]









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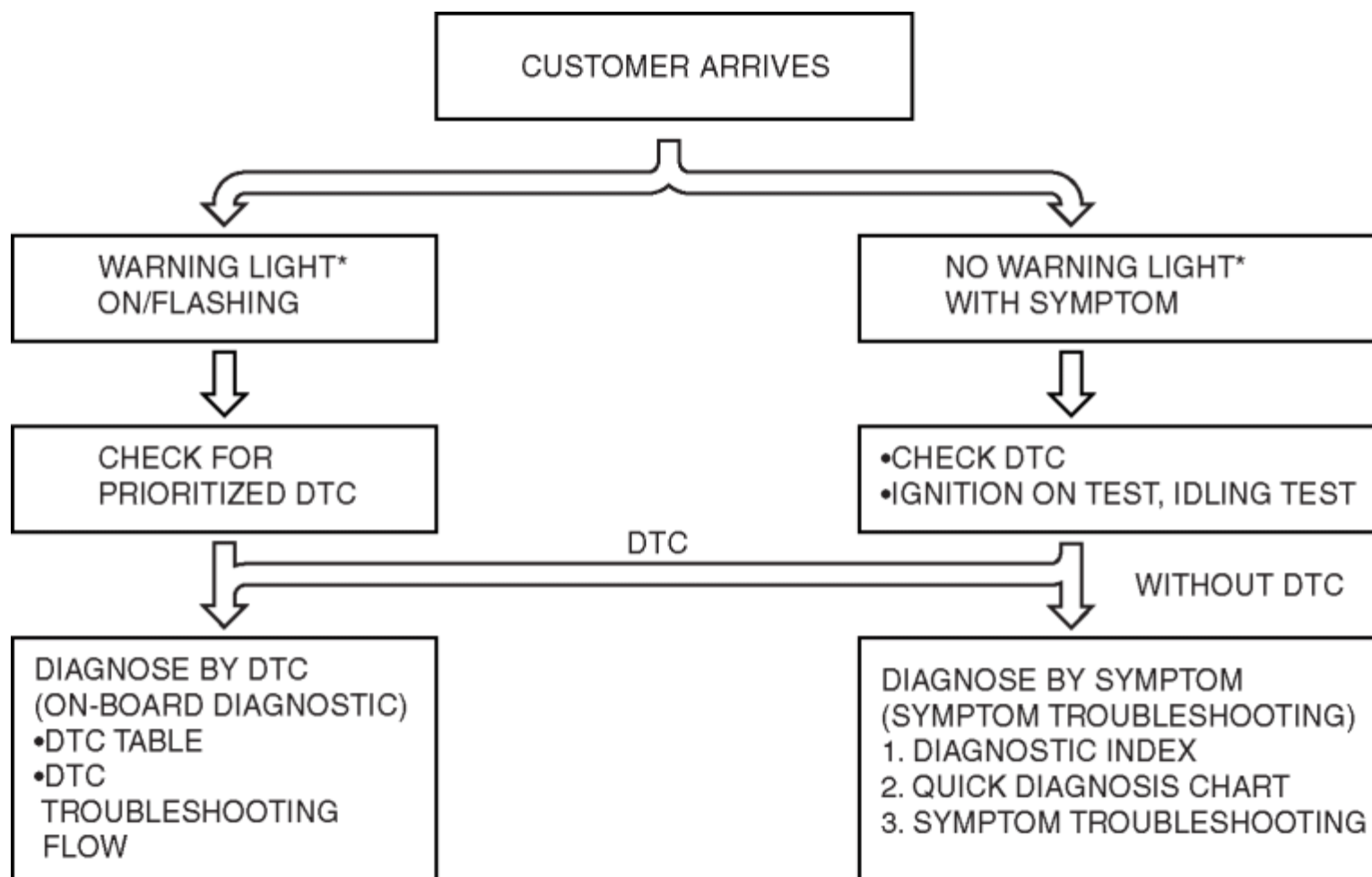
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### FOREWORD [LF]

- When the customer reports a vehicle malfunction, check the malfunction indicator lamp (MIL) indication and diagnostic trouble code (DTC), then diagnose the malfunction according to the following flowchart:
  - If a DTC exists, diagnose the applicable DTC inspection. (See [DTC TABLE \[LF\]](#).)
  - If no DTC exists and the MIL does not illuminate or flash, diagnose the applicable symptom troubleshooting. (See [QUICK DIAGNOSTIC CHART \[LF\]](#).)



\*: Malfunction Indicator Lamp (MIL), Generator Warning Light, Security Light

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### INTERMITTENT CONCERN TROUBLESHOOTING [LF]

#### Vibration Method

- If malfunction occurs or becomes worse while driving on a rough road or when the engine is vibrating, perform the steps below.

#### NOTE:

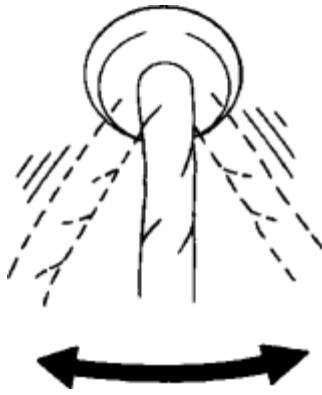
- There are several reasons vehicle or engine vibration could cause an electrical malfunction. Inspect the following:
  - Connectors not fully seated
  - Wiring harnesses not having full play
  - Wiring harnesses laying across brackets or moving parts
  - Wiring harnesses routed too close to hot parts
- An improperly routed, improperly clamped, or loose wiring harness can cause wiring to become pinched between parts.
- The connector joints, points of vibration, and places where wiring harnesses pass such as through the firewall and body panels are the major areas to be checked.

#### Inspection Method for Switch Connectors or Wiring Harnesses

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (Engine off).

#### NOTE:

- If the engine starts and runs, perform the following steps during idle.
3. Access PIDs for the switch you are inspecting.
  4. Turn the switch on manually.
  5. Slightly shake each connector or wiring harness vertically and horizontally while monitoring the PID.
    - If PID value is unstable, inspect for poor connection.

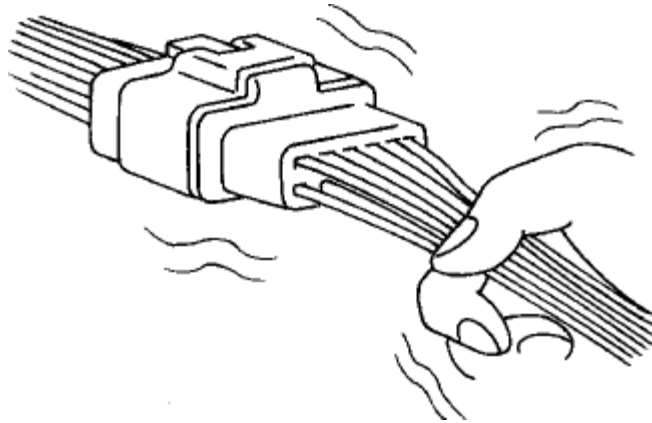


#### Inspection Method for Sensor Connectors or Wiring Harnesses

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (Engine off).

#### NOTE:

- If the engine starts and runs, perform the following steps during idle.
3. Access PIDs for the switch you are inspecting.
  4. Slightly shake each connector or wiring harness vertically and horizontally while monitoring the PID.
- If PID value is unstable, inspect for poor connection.



#### Inspection Method for Sensors

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (Engine off).

#### NOTE:

- If the engine starts and runs, perform the following steps during idle.
3. Access PIDs for the switch you are inspecting.
  4. Vibrate the sensor slightly with your finger.

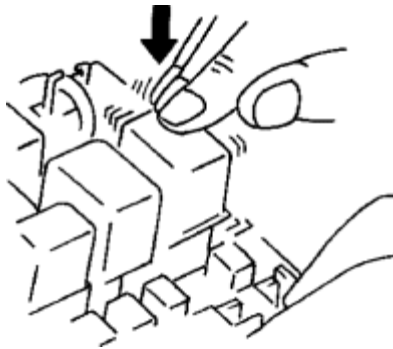
- If PID value is unstable or malfunction occurs, check for poor connection or poorly mounted sensor or both.

### Inspection Method for Actuators or Relays

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (Engine off).

#### NOTE:

- If the engine starts and runs, perform the following steps during idle.
3. Prepare the output state control function for actuators or relays that you are inspecting.
  4. Vibrate the actuator or relay with your finger for **3 s** after output state control function is activated.
- If variable click sound is heard, check for poor connection or poorly mounted actuator or both, or the relay.



#### NOTE:

- Vibrating relays too strongly may result in open relays.

### Water Sprinkling Method

If malfunction occurs only under high humidity or rainy/snowy weather, perform the following steps:

#### CAUTION:

- Indirectly change the temperature and humidity by spraying water onto the front of the radiator.
  - If a vehicle is subject to water leakage, the leakage may damage the control module. When testing a vehicle with a water leakage problem, special caution must be used.
1. Connect the M-MDS to the DLC-2 if you are inspecting sensors or switches.
  2. Turn the ignition switch to the ON position (Engine off).

#### NOTE:

- If the engine starts and runs, perform the following steps at idle.
3. Access PIDs for sensor or switch if you are inspecting sensors or switches.

4. If you are inspecting the switch, turn it on manually.
5. Spray water onto the vehicle or run it through a car wash.
  - If PID value is unstable or malfunction occurs, repair or replace part if necessary.



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### SYMPTOM DIAGNOSTIC INDEX [LF]

- Confirm trouble symptom using the following diagnostic index, then go to appropriate troubleshooting chart.

#### Diagnostic Index

No.	TROUBLESHOOTING ITEM		DESCRIPTION	PAGE
1	Melting of main or other fuses		—	(See <b>NO.1 MELTING OF MAIN OR OTHER FUSES [LF]</b> .)
2	MIL illuminates		The MIL is illuminated incorrectly.	(See <b>NO.2 MIL ILLUMINATES [LF]</b> .)
3	Will not crank		The starter does not work.	(See <b>NO.3 WILL NOT CRANK [LF]</b> .)
4	Hard to start/long crank/erratic start/erratic crank		The starter cranks the engine at normal speed but the engine requires excessive cranking time before starting.	(See <b>NO.4 HARD TO START/LONG CRANK/ERRATIC START/ERRATIC CRANK [LF]</b> .)
5	Engine stalls.	After start/at idle	The engine stops unexpectedly at idle and/or after start or both.	(See <b>NO.5 ENGINE STALLS-AFTER START/AT IDLE [LF]</b> .)
6	Crankes normally but will not start		The starter cranks engine at normal speed but the engine will not run.	(See <b>NO.6 CRANKS NORMALLY BUT WILL NOT START [LF]</b> .)
7	Slow return to idle		The engine takes more time than normal to return to idle speed.	(See <b>NO.7 SLOW RETURN TO IDLE [LF]</b> .)
8	Engine runs rough/rolling idle		The engine speed fluctuates between the specified idle speed and lower speed and the engine shakes excessively.	(See <b>NO.8 ENGINE RUNS ROUGH/ROLLING IDLE [LF]</b> .)



9	Fast idle/runs on		<p>The engine speed continues at fast idle after warm-up.</p> <p>The engine runs after the ignition switch is turned off.</p>	(See <b>NO.9 FAST IDLE/RUNS ON [LF].</b> )
10	Low idle/stalls during deceleration		The engine stops unexpectedly at the beginning of deceleration or recovery from deceleration.	(See <b>NO.10 LOW IDLE/STALLS DURING DECELERATION [LF].</b> )
11	Engine stalls/quits.	Acceleration/cruise	<p>The engine stops unexpectedly at the beginning of acceleration or during acceleration.</p> <p>The engine stops unexpectedly while cruising.</p>	(See <b>NO.11 ENGINE STALLS/QUITS, ENGINE RUNS ROUGH, MISSES, BUCK/JERK, HESITATION/STUMBLE, SURGES [LF].</b> )
	Engine runs rough.	Acceleration/cruise	The engine speed fluctuates during acceleration or cruising.	
	Misses	Acceleration/cruise	The engine misses during acceleration or cruising.	
	Buck/jerk	Acceleration/cruise/deceleration	The vehicle bucks/jerks during acceleration, cruising, or deceleration.	
	Hesitation/stumble	Acceleration	A momentary pause at the beginning of acceleration or during acceleration.	
	Surges	Acceleration/cruise	A momentary minor irregularity in engine output.	
12	Lack/loss of power	Acceleration/cruise	The performance is poor under load (such as power down when climbing hills).	(See <b>NO.12 LACK/LOSS OF POWER-ACCELERATION/CRUISE [LF].</b> )
13	Knocking/pinging/detonation	Acceleration/cruise	Sound is produced when the air/fuel mixture is ignited by something other than the spark plug (such as hot spot in combustion chamber).	(See <b>NO.13 KNOCKING/PINGING-ACCELERATION/CRUISE [LF].</b> )
14	Poor fuel economy		The fuel economy is unsatisfactory.	(See <b>NO.14 POOR FUEL ECONOMY [LF].</b> )

15	Emission compliance		Fails emissions test.	(See <b>NO.15 EMISSION COMPLIANCE [LF].</b> )
16	High oil consumption/leakage		The oil consumption is excessive.	(See <b>NO.16 HIGH OIL CONSUMPTION/LEAKAGE [LF].</b> )
17	Cooling system concerns	Overheating	The engine runs at higher than normal temperature/overheats.	(See <b>NO.17 COOLING SYSTEM CONCERNS-OVERHEATING [LF].</b> )
18	Cooling system concerns	Runs cold	The engine does not reach normal operating temperature.	(See <b>NO.18 COOLING SYSTEM CONCERNS-RUNS COLD [LF].</b> )
19	Exhaust smoke		Blue, black, or white smoke from exhaust system	(See <b>NO.19 EXHAUST SMOKE [LF].</b> )
20	Fuel odor (in engine compartment)		Gasoline fuel smell or visible leakage	(See <b>NO.20 FUEL ODOR (IN ENGINE COMPARTMENT) [LF].</b> )
21	Engine noise		Engine noise from under hood	(See <b>NO.21 ENGINE NOISE [LF].</b> )
22	Vibration concerns (engine)		Vibration from under hood or driveline	(See <b>NO.22 VIBRATION CONCERNS (ENGINE) [LF].</b> )
23	A/C does not work sufficiently.		The A/C compressor magnetic clutch does not engage when A/C is turned on.	(See <b>NO.23 A/C DOES NOT WORK SUFFICIENTLY [LF].</b> )
24	A/C is always on or A/C compressor runs continuously.		The A/C compressor magnetic clutch does not disengage.	(See <b>NO.24 A/C IS ALWAYS ON/A/C COMPRESSOR RUNS CONTINUOUSLY [LF].</b> )
25	A/C does not cut off under wide open throttle conditions.		The A/C compressor magnetic clutch does not disengage under wide open throttle.	(See <b>NO.25 A/C DOES NOT CUT OFF UNDER WIDE OPEN THROTTLE CONDITIONS [LF].</b> )
26	Exhaust sulphur smell		Rotten egg smell (sulphur) from exhaust	(See <b>NO.26 EXHAUST SULPHUR SMELL [LF].</b> )
27	Fuel refill concerns		The fuel tank does not fill smoothly.	(See <b>NO.27 FUEL REFILL CONCERNS [LF].</b> )

28	Fuel filling shut off issues		The fuel does not shut off properly.	(See <b>NO.28 FUEL FILLING SHUT OFF CONCERNS [LF].</b> )
29	Spark plug condition		An incorrect spark plug condition.	(See <b>NO.29 SPARK PLUG CONDITION [LF].</b> )
30	AT concerns	Upshift/downshift engagement	AT concerns not related to engine performance.	(See <b>SYMPTOM TROUBLESHOOTING ITEM TABLE [SJ6A-EL].</b> )

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**QUICK DIAGNOSTIC CHART [LF]**

X: Applicable

Possible factor																										
Troubleshooting item			Starter motor malfunction (Mechanical or electrical)	Starter circuit including ignition switch is open.	Starter interlock switch malfunction (MT)	Improper engine oil level	Low or dead battery	Charging system malfunction	Improper engine compression	Improper valve timing	Hydrolocked engine	Improper engine oil viscosity	Improper dipstick	Base engine malfunction	Drive plate or flywheel are seized.	Improper tension or damaged drive belts	Improper engine coolant level	Water and anti-freeze mixture is improper.	Cooling system malfunction (Radiator, hoses, overflow system, thermostat, etc.)	Cooling fan system malfunction	Engine or transaxle mounts are improperly installed.	Cooling fan seat is improper.	Cruise control system operation improperly	Fuel quality		
1	Melting of main or other fuses																									
2	MIL illuminates																									
3	Will not crank		x	x	x		x	x			x					x										
4	Hard to start/long crank/erratic start/erratic crank		x																					x		
5	Engine stalls.	After start/at idle							x	x														x		
6	Crank normally but will not start								x	x														x		
7	Slow return to idle																		x							
8	Engine runs rough/rolling idle								x	x														x		
9	Fast idle/runs on																						x			
10	Low idle/stalls during deceleration																						x			
11	Engine stalls/quits.	Acceleration/cruise							x	x													x	x		
	Engine runs rough.	Acceleration/cruise							x	x														x		
	Misses	Acceleration/cruise							x	x														x		
	Buck/jerk	Acceleration/cruise/ deceleration							x	x														x		
	Hesitation/stumble	Acceleration							x	x														x		
	Surges	Acceleration/cruise							x	x														x		
12	Lack/loss of power	Acceleration/cruise							x	x														x		
13	Knocking/pinging	Acceleration/cruise							x										x							
14	Poor fuel economy								x	x									x	x				x		
15	Emission compliance								x	x				x					x							
16	High oil consumption/leakage											x	x	x												
17	Cooling system concerns	Overheating														x	x	x	x	x						
18	Cooling system concerns	Runs cold																	x	x						
19	Exhaust smoke								x						x				x							
20	Fuel odor (in engine compartment)																									
21	Engine noise					x								x		x										
22	Vibration concerns (engine)															x					x	x				
23	A/C does not work sufficiently.																									
24	A/C is always on or A/C compressor runs continuously.																									
25	A/C does not cut off under WOT conditions.																						x			
26	Exhaust sulfur smell																							x		
27	Fuel refill concerns																									
28	Fuel filling shut off issues																									
29	Spark plug condition								x																	
30	AT concerns	Upshift/downshift engagement	See Section 05-03 TROUBLESHOOTING																							

Possible factor			Variable valve timing system malfunction	Engine overheating	Air cleaner element clogging or restriction	Air leakage from intake-air system (Loose tubes, cracks, gaskets breakage)	Intake air temperature is too hot	Idle learning of electronic throttle control system is not completed	Electronic throttle control improper operation	Throttle body malfunction	Variable intake air system malfunction	Vacuum leakage (Vacuum hose damage, misrouting)	Ignition coil malfunction (e.g. open, short or cracks)	Initial ignition timing misadjustment (CKP sensor & crankshaft pulley misadjustment)	Spark plug malfunction	Erratic signal to ignition coil	CKP sensor is damaged. (e.g. open or short circuits)	Crankshaft pulley is damaged	Improper gap between CKP sensor and crankshaft	Fuel pump malfunction (Mechanically or electrically)	Pressure regulator malfunction	Fuel hoses restriction or clogging
Troubleshooting item																						
1	Melting of main or other fuses																					
2	MIL illuminates		X						X		X						X					
3	Will not crank																					
4	Hard to start/long crank/erratic start/erratic crank				X	X			X			X			X	X	X	X	X	X	X	X
5	Engine stalls.	After start/at idle	X	X	X	X			X			X	X	X	X	X	X	X	X	X	X	X
6	Crank normally but will not start		X	X	X	X			X			X	X	X	X	X	X	X	X	X	X	X
7	Slow return to idle									X												
8	Engine runs rough/rolling idle		X	X	X	X		X	X			X		X	X	X	X	X	X	X	X	X
9	Fast idle/runs on					X			X	X												
10	Low idle/stalls during deceleration					X			X			X										
11	Engine stalls/quits.	Acceleration/cruise		X	X	X			X	X		X			X	X	X	X	X	X	X	X
	Engine runs rough.	Acceleration/cruise		X	X	X			X	X		X			X	X	X	X	X	X	X	X
	Misses	Acceleration/cruise		X	X	X			X	X		X			X	X	X	X	X	X	X	X
	Buck/jerk	Acceleration/cruise/ deceleration		X	X	X			X	X		X			X	X	X	X	X	X	X	X
	Hesitation/stumble	Acceleration		X	X	X			X	X		X			X	X	X	X	X	X	X	X
	Surges	Acceleration/cruise		X	X	X			X	X		X			X	X	X	X	X	X	X	X
12	Lack/loss of power	Acceleration/cruise	X	X	X	X	X		X	X	X	X			X	X	X	X	X	X	X	X
13	Knocking/pinging	Acceleration/cruise		X																X	X	
14	Poor fuel economy		X		X						X				X	X					X	
15	Emission compliance				X	X				X		X			X	X				X	X	X
16	High oil consumption/leakage																					
17	Cooling system concerns	Overheating																				
18	Cooling system concerns	Runs cold																				
19	Exhaust smoke				X								X		X	X				X	X	X
20	Fuel odor (in engine compartment)																				X	
21	Engine noise					X						X										
22	Vibration concerns (engine)																					
23	A/C does not work sufficiently.																					
24	A/C is always on or A/C compressor runs continuously.																					
25	A/C does not cut off under WOT conditions.																					
26	Exhaust sulfur smell											X								X	X	X
27	Fuel refill concerns																					
28	Fuel filling shut off issues																					
29	Spark plug condition				X										X	X				X	X	X
30	AT concerns	Upshift/downshift engagement	See Section 05-03 TROUBLESHOOTING																			

[illegible]

Possible factor																										
Troubleshooting item		IAT sensor and related circuit malfunction	Barometric pressure sensor malfunction	Neutral or clutch pedal position switch and related circuit malfunction (MTX)	MAF sensor and related circuit malfunction	Knock sensor and related circuit malfunction	TP sensor and related circuit malfunction	Accelerator pedal position sensor and related circuit malfunction	EHPAS and related circuit malfunction	Improper refrigerant charging amount	A/C relay (A/C control signal circuit malfunction)	A/C compressor magnetic clutch malfunction	Condenser fan system malfunction	Improper load signal input	Clutch slippage (MT)	AT related parts malfunction (AT)	VSS and related circuit malfunction	Improper ATF level (AT)	Brake dragging	Loose parts	Improper balance of wheels and tires	Drive line malfunction	Suspension malfunction	Immobilizer system operating (if equipped)	Immobilizer system or related circuit malfunction (if equipped)	
1	Melting of main or other fuses																									
2	MIL illuminates		x	x	x	x	x		x								x									
3	Will not crank																							x	x	
4	Hard to start/long crank/erratic start/erratic crank					x																				
5	Engine stalls.	After start/at idle		x						x	x													x	x	
6	Cranks normally but will not start																							x	x	
7	Slow return to idle																									
8	Engine runs rough/rolling idle			x					x	x	x		x	x												
9	Fast idle/runs on													x												
10	Low idle/stalls during deceleration				x	x		x	x			x	x													
11	Engine stalls/quits.	Acceleration/cruise	x		x		x	x		x	x				x	x	x									
	Engine runs rough.	Acceleration/cruise	x		x		x	x		x	x				x	x	x									
	Misses	Acceleration/cruise			x		x	x		x	x				x	x	x									
	Buck/jerk	Acceleration/cruise/ deceleration			x		x	x		x	x				x	x	x									
	Hesitation/stumble	Acceleration	x		x		x	x		x	x				x	x	x									
	Surges	Acceleration/cruise			x		x	x		x	x				x	x	x									
12	Lack/loss of power	Acceleration/cruise			x		x	x		x	x				x	x	x		x							
13	Knocking/pinging	Acceleration/cruise	x		x	x																				
14	Poor fuel economy				x										x			x	x							
15	Emission compliance																									
16	High oil consumption/leakage																									
17	Cooling system concerns	Overheating								x	x		x													
18	Cooling system concerns	Runs cold											x													
19	Exhaust smoke																									
20	Fuel odor (in engine compartment)																									
21	Engine noise																				x					
22	Vibration concerns (engine)																				x	x	x	x		
23	A/C does not work sufficiently.									x	x	x														
24	A/C is always on or A/C compressor runs continuously.										x	x														
25	A/C does not cut off under WOT conditions.							x																		
26	Exhaust sulfur smell																									
27	Fuel refill concerns																									
28	Fuel filling shut off issues																									
29	Spark plug condition					x																				
30	AT concerns	Upshift/downshift engagement	See Section 05-03 TROUBLESHOOTING																							





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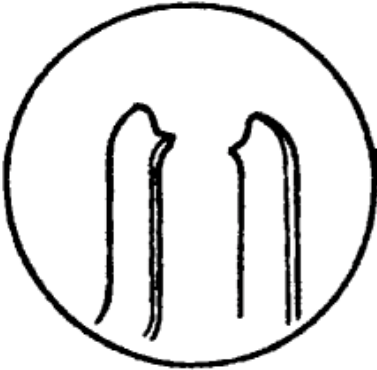
NO.1 MELTING OF MAIN OR OTHER FUSES [LF]

1

MELTING OF MAIN OR OTHER FUSES

[TROUBLESHOOTING HINTS]

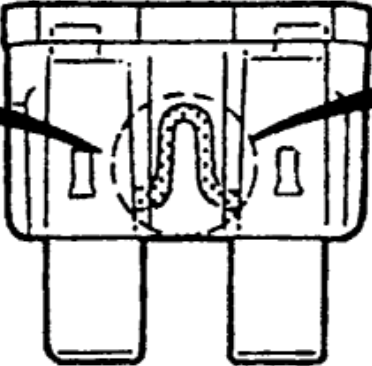
Inspect condition of fuse.



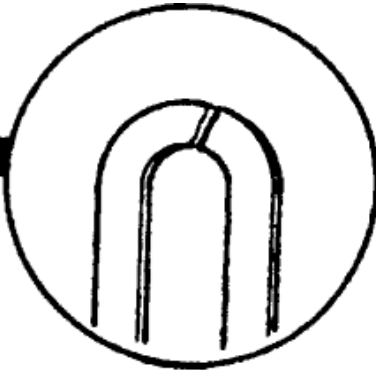
Shorted wiring harness

↓

Repair shorted wiring harness and replace fuse



Fuse



Deterioration

↓

Replace fuse

Damaged fuse	Related wiring harness
MAIN	<div>MAIN fuse</div> <ul style="list-style-type: none"><li>ROOM fuse</li><li>IG KEY2 fuse</li><li>ST fuse</li><li>FAN fuse *1</li><li>Generator</li></ul>
ROOM	<div>ROOM fuse</div> <ul style="list-style-type: none"><li>DLC-2</li><li>PCM</li></ul>
IG KEY2	<div>IG KEY2 fuse</div>

	<ul style="list-style-type: none"> <li>• Ignition switch</li> </ul>
ST	<b>ST fuse</b> <ul style="list-style-type: none"> <li>• Starter relay</li> </ul>
FAN *1	<b>FAN fuse</b> <ul style="list-style-type: none"> <li>• Cooling fan relay No.1 <ul style="list-style-type: none"> <li>▪ Cooling fan motor</li> </ul> </li> <li>• Cooling fan relay No.2 <ul style="list-style-type: none"> <li>▪ Cooling fan motor</li> </ul> </li> </ul>
FAN *1	<b>FAN fuse</b> <ul style="list-style-type: none"> <li>• Cooling fan relay No.1 <ul style="list-style-type: none"> <li>▪ PCM</li> </ul> </li> <li>• Cooling fan relay No.2 <ul style="list-style-type: none"> <li>▪ PCM</li> </ul> </li> <li>• Cooling fan relay No.3 <ul style="list-style-type: none"> <li>▪ PCM</li> </ul> </li> </ul>
FUEL PUMP	<b>FUEL PUMP fuse</b> <ul style="list-style-type: none"> <li>• Fuel pump relay <ul style="list-style-type: none"> <li>▪ Fuel pump</li> </ul> </li> </ul>
IG KEY1	<b>IG KEY1 fuse</b> <ul style="list-style-type: none"> <li>• Ignition switch <ul style="list-style-type: none"> <li>▪ METER fuse</li> </ul> </li> </ul>
METER	<b>METER fuse</b> <ul style="list-style-type: none"> <li>• Ignition relay</li> </ul>
ETV	<b>ETV fuse</b> <ul style="list-style-type: none"> <li>• Drive-by-wire relay <ul style="list-style-type: none"> <li>▪ PCM</li> </ul> </li> </ul>
EGI COMP1	<b>EGI COMP1 fuse</b> <ul style="list-style-type: none"> <li>• Oil control valve</li> <li>• Purge solenoid valve</li> <li>• Variable intake air control solenoid valve</li> <li>• EGR valve</li> </ul>
EGI COMP2	<b>EGI COMP2 fuse</b>

	<p>Drive-by-wire relay</p> <ul style="list-style-type: none"> <li>▪ PCM</li> <li>• Evaporative leak detection pump</li> <li>• MAF sensor</li> <li>• VSS (MT without ABS/DSC)</li> </ul>
EGI INJ	<p><b>EGI INJ fuse</b></p> <ul style="list-style-type: none"> <li>• Fuel injector No.1</li> <li>• Fuel injector No.2</li> <li>• Fuel injector No.3</li> <li>• Fuel injector No.4</li> </ul>

\*1  
Two FAN fuses differs in a current value.

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## 2008 - MX-5 - Engine

### NO.2 MIL ILLUMINATES [LF]

2	MIL ILLUMINATES
<b>DESCRIPTION</b>	The MIL is illuminated incorrectly.
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>The PCM illuminates for emission-related concern (DTC is stored in PCM)</li> <li>Instrument cluster malfunction</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>If the MIL blinks at steady rate, misfire condition could possibly exist.</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect the M-MDS to the DLC-2.  Turn the ignition switch to the ON position (Engine off).  Retrieve any DTCs.  Are there any DTCs displayed?	Yes	<b>DTC is displayed:</b> <ul style="list-style-type: none"> <li>Go to appropriate the DTC inspection.</li> </ul> (See <b>DTC TABLE [LF]</b> .)
		No	<b>No DTC is displayed:</b> <ul style="list-style-type: none"> <li>Inspect instrument cluster operation.</li> </ul> (See <b>INSTRUMENT CLUSTER INSPECTION.</b> )
2	<ul style="list-style-type: none"> <li>Verify test results.               <ul style="list-style-type: none"> <li>If normal, return to diagnostic index to service any additional symptoms.</li> </ul>               (See <b>SYMPTOM DIAGNOSTIC INDEX [LF]</b>.)             </li> <li>If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.</li> </ul>		

- If vehicle is repaired, troubleshooting completed.
- If vehicle is not repaired or additional diagnostic information is not available, replace the PCM.

(See [PCM REMOVAL/INSTALLATION \[LF\]](#).)

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## 2008 - MX-5 - Engine

### NO.3 WILL NOT CRANK [LF]

3	WILL NOT CRANK
DESCRIPTION	The starter does not work.
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Open starter circuit between ignition switch and starter</li><li>• TR switch malfunction (AT)</li><li>• TR switch misadjustment (AT)</li><li>• Low or dead battery</li><li>• Charging system malfunction.</li><li>• Starter interlock switch malfunction (MT)</li><li>• Starter malfunction</li><li>• Seized/hydrolocked engine, flywheel (MT) or drive plate (AT)</li><li>• Immobilizer system and/or circuit malfunction</li><li>• Immobilizer system operating properly. (Ignition key is not registered)</li><li>• Advanced keyless entry system malfunction</li></ul>

### Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect the following: <ul style="list-style-type: none"><li>• Battery connection</li><li>• Battery condition</li><li>• Transaxle is in Park or Neutral. (AT)</li><li>• Clutch is fully depressed. (MT)</li><li>• Fuses</li></ul> Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 1.

2	<b>NOTE:</b> <ul style="list-style-type: none"> <li>The following test should be performed on the advanced keyless entry system. If not equipped, go to the next step.</li> </ul> <p>Start the engine using the mechanical ignition key.</p> <p>Does the engine start?</p>	Yes	Inspect advanced keyless entry system and repair or replace according to inspection result.  (See <b>SYMPTOM TROUBLESHOOTING CHART [KEYLESS ENTRY SYSTEM]</b> .)
		No	Go to the next step.
3	Connect the M-MDS to the DLC-2.  Do the following conditions appear? <ul style="list-style-type: none"> <li>The engine is not completely started.</li> <li>DTC P1260 is displayed.</li> </ul>	Yes	<b>Both conditions appear:</b>  Go to Step 5.
		No	<b>Either or other condition appears:</b>  Go to the next step.
4	Turn the ignition switch to the ON position.  Is the coil connector securely connected to the coil?	Yes	Go to the next step.
		No	Connect the coil connector securely.  Return to Step 2.
5	Does the security light flush?	Yes	Go to the next step.
		No	Inspect and repair or replace the following: <ul style="list-style-type: none"> <li>Wiring harnesses and connectors from keyless control module terminal 3F and instrument cluster terminal 2F</li> <li>Instrument cluster</li> </ul> (See <b>INSTRUMENT CLUSTER INSPECTION</b> .)
6	Connect the M-MDS to the DLC-2 and retrieve DTC for PCM, instrument cluster and keyless control module.  <b>DTC</b> <ul style="list-style-type: none"> <li><b>PCM: B1342, U0073, U0155</b></li> <li><b>Instrument cluster: B1213, B1600, B1601, B1602, B1681, B2103, B2139, B2431, U0100, U0214</b></li> </ul>	Yes	Go to appropriate DTC inspection.  (See <b>DTC TABLE [LF]</b> .)
		No	Go to the next step.



	<ul style="list-style-type: none"> <li>• <b>Keyless control module (with advanced keyless entry system): B1681, B2103, B1213</b></li> </ul>		
7	Inspect for the following wiring harnesses and connectors:  <b>With advanced keyless entry system</b> <ul style="list-style-type: none"> <li>• Between coil terminal A and keyless control module terminal 3Y</li> <li>• Between coil terminal B and keyless control module terminal 3AA</li> <li>• Between keyless control module terminal 4A and instrument cluster terminal 2Q</li> <li>• Between keyless control module terminal 4C and instrument cluster terminal 2S</li> </ul> <b>Without advanced keyless entry system</b> <ul style="list-style-type: none"> <li>• Between coil terminal A and instrument cluster terminal 2S</li> <li>• Between coil terminal B and instrument cluster terminal 2Q</li> </ul> Is there any malfunction?	Yes	Repair or replace suspected wiring harness and connector.
		No	Go to the next step.
8	Inspect for the following wiring harnesses and connectors: <ul style="list-style-type: none"> <li>• Between PCM terminal 1AM and instrument cluster terminal 1J</li> <li>• Between PCM terminal 1AI and instrument cluster terminal 1L</li> </ul> Is there any malfunction?	Yes	Repair or replace suspected wiring harness and connector.
		No	Go to the next step.
9	Is clicking sound heard from starter relay when the ignition switch is turned to STRT?	Yes	Go to Step 14.
		No	ATX: Go to the next step. MTX: Go to STEP 11.
10	Connect the M-MDS to the DLC-2.	Yes	Go to Step12.

	<p>Turn ignition switch to the ON position. (Engine off)</p> <p>Access TR PID.</p> <p>Is TR POD indicated P/N when selecting P or N position</p>	No	<p>Inspect TR switch is adjusted properly, inspect for open or short circuit between TR switch and TCM.</p> <p>Repair or replace components as required.</p> <p>Then repeat step 9.</p>
11	<p>INSPECT STARTER INTERLOCK SWITCH</p> <p>Inspect the starter interlock switch</p> <p>Is starter interlock switch normal?</p>	Yes	Go to the next step.
		No	<p>Inspect starter interlock switch and related wiring harnesses.</p> <p>Repair or replace components as required.</p> <p>Then repeat step 9.</p>
12	<p>Inspect the starter relay and following harnesses.</p> <p>Between starter relay and PCM</p> <p>Between starter relay and ignition switch</p> <p>(See <b>RELAY INSPECTION.</b>)</p> <p>Are they normal?</p>	Yes	Go to the next step.
		No	<p>Repair or replace components as required.</p> <p>Then repeat step 9.</p>
13	<p>Inspect IGNTION switch and related harnesses.</p> <p>(See <b>IGNITION SWITCH INSPECTION.</b>)</p> <p>Are they normal?</p>	Yes	Go to the next step.
		No	<p>Repair or replace components as required.</p> <p>Then repeat step 9.</p>
14	<p>Inspect the following harnesses.</p> <p>Between starter relay and Battery</p> <p>Between starter relay and Starter</p> <p>Are they normal?</p>	Yes	Go to the next step.
		No	<p>Repair or replace as required.</p> <p>Then go to next step.</p>
15	<p>Inspect the starting system.</p> <p>(See <b>STARTER INSPECTION [LF].</b>)</p> <p>Is starting system normal?</p>	Yes	Go to the next step.
		No	Repair or replace components as required.
16	<p>Inspect for seized/hydro locked engine or flywheel.</p> <p>Is ENGINE seized or hydro locked?</p>	Yes	Repair or replace components as required.
		No	Go to the next step.

17	<p>Connect the M-MDS to the DLC-2.</p> <p>Retrieve any continuous memory DTCs.</p> <p>Are there any continuous memory DTCs displayed?</p>	Yes	<p><b>DTC is displayed:</b></p> <ul style="list-style-type: none"> <li>Go to the appropriate DTC inspection.</li> </ul> <p>(See <a href="#">DTC TABLE [LF]</a>.)</p> <p><b>Communication error message is displayed:</b></p> <p>Inspect for following:</p> <ul style="list-style-type: none"> <li>Open circuit in wiring harness between main relay and PCM terminal 1AW or 1BE</li> <li>Open circuit in wiring harness between main relay terminal E and PCM terminal 1Q</li> <li>Main relay is stuck open.</li> <li>Open or short circuit in wiring harness between the DLC-2 and PCM terminals 1AM or 1AI</li> <li>Open or poor GND circuit (PCM terminal 1BD, 1AZ, 1BB or 1BH)</li> <li>Poor connection of vehicle body GND</li> </ul>
		No	<p><b>No DTC is displayed:</b></p> <p>Go to the next step.</p>
18	<p>Retrieve any KOEO DTCs using M-MDS</p> <p>Are there DTCs displayed during KOEO inspection?</p>	Yes	<p><b>DTC is displayed:</b></p> <p>Go to the appropriate DTC inspection.</p> <p>(See <a href="#">DTC TABLE [LF]</a>.)</p>
		No	<p><b>No DTC is displayed:</b></p> <p>Go to the next step.</p>
19	<ul style="list-style-type: none"> <li>Verify test results. <ul style="list-style-type: none"> <li>If normal, return to diagnostic index to service any additional symptoms.</li> </ul> <p>(See <a href="#">SYMPTOM DIAGNOSTIC INDEX [LF]</a>.)</p></li> <li>If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.</li> </ul>		

- If vehicle is repaired, troubleshooting completed.
- If vehicle is not repaired or additional diagnostic information is not available, replace the PCM.

(See [PCM REMOVAL/INSTALLATION \[LF\]](#).)

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## 2008 - MX-5 - Engine

### NO.4 HARD TO START/LONG CRANK/ERRATIC START/ERRATIC CRANK [LF]

4	HARD TO START/LONG CRANK/ERRATIC START/ERRATIC CRANK
DESCRIPTION	<ul style="list-style-type: none"><li>• The starter cranks engine at normal speed but engine requires excessive cranking time before starting.</li><li>• The battery is in normal condition.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Erratic signal to ignition coil</li><li>• Vacuum leakage</li><li>• Poor fuel quality</li><li>• Starting system malfunction</li><li>• Spark plug malfunction</li><li>• Air leakage from intake-air system</li><li>• Erratic signal from CKP sensor</li><li>• Erratic signal from CMP sensor</li><li>• Improper air/fuel mixture ratio control</li><li>• Air cleaner restriction</li><li>• Improper operation of electronic throttle control system</li><li>• PCV valve malfunction</li><li>• Inadequate fuel pressure</li><li>• Purge solenoid valve malfunction</li><li>• MAF sensor contamination</li><li>• Incorrect MAF sensor GND voltage</li><li>• Restriction in exhaust system</li><li>• EGR valve malfunction</li><li>• Pressure regulator malfunction (built-in fuel pump unit)</li></ul> <p><b>WARNING:</b></p> <p>The following troubleshooting flow chart contains the fuel system diagnosis and repair</p>

procedures. Read the following warnings before servicing the fuel system:

- Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.
- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.

(See **BEFORE SERVICE PRECAUTION [LF]**.)

(See **AFTER SERVICE PRECAUTION [LF]**.)

**CAUTION:**

- Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.

**Diagnostic procedure**

STEP	INSPECTION	RESULTS	ACTION
1	Inspect for the following: <ul style="list-style-type: none"><li>• Vacuum leakage</li><li>• Proper fuel quality (such as proper octane, contamination, winter/summer blend)</li><li>• Loose bands on intake-air system</li><li>• Cracks on intake-air system parts</li><li>• Intake-air system restriction (such as air cleaner element, fresh air duct.)</li></ul> Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 1.
2	Connect the M-MDS to the DLC-2.  Turn the ignition switch to the ON position (Engine off).  Retrieve any DTCs.  Are there any DTCs displayed?	Yes	<b>DTC is displayed:</b>  Go to the appropriate DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	<b>No DTC is displayed:</b>  Go to the next step.
3	Is engine overheating?	Yes	Go to symptom troubleshooting "No.17 Cooling system concerns-Overheating".  <b>NO.17 COOLING SYSTEM CONCERNS-</b>

			(See <b>OVERHEATING [LF].</b> )
		No	Go to the next step.
4	Inspect the ignition coil related wiring harness condition (intermittent open or short circuit) for all cylinders.  Are wiring harness conditions normal?	Yes	Go to the next step.
		No	Repair the wiring harnesses.
5	Inspect the spark plug conditions.  Is spark plug wet, covered with carbon or grayish white?	Yes	<b>Spark plug is wet or covered with carbon:</b>  Inspect for fuel leakage from fuel injector.  <b>Spark plug is grayish white:</b>  Inspect the fuel injector for clogging.
		No	Install the spark plugs on original cylinders.  Go to the next step.
6	Visually inspect the CKP sensor and teeth of crankshaft pulley.  Are the CKP sensor and teeth of crankshaft pulley normal?	Yes	Go to the next step.
		No	Replace the malfunctioning part.
7	Remove and shake the PCV valve.  Does the PCV valve rattle?	Yes	Go to the next step.
		No	Replace the PCV valve.
8	Attempt to start engine at part throttle.  Does engine run smoothly at part throttle?	Yes	Inspect the electronic throttle control system operation.  (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF].</b> )
		No	Go to the next step.
9	Install the fuel pressure gauge between the fuel pipe and fuel distributor.  Short check connector terminal F/P to body GND using a jumper wiring.  Turn the ignition switch to the ON position.  Is fuel line pressure correct with ignition switch ON?	Yes	Go to the next step.
		No	<b>Zero or low:</b>  Inspect the fuel pump relay and the fuel pump circuit.  Inspect the fuel line for clogging.  If there is no malfunction, replace the fuel

	(See <b>FUEL LINE PRESSURE INSPECTION [LF].</b> )		<p>pump unit.</p> <p>(See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF].</b>)</p> <p><b>High:</b></p> <p>Replace the fuel pump unit.</p> <p>(See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF].</b>)</p>
10	<p>Is the fuel line pressure held after ignition switch is turned off?</p> <p>(See <b>FUEL LINE PRESSURE INSPECTION [LF].</b>)</p>	Yes	Go to the next step.
		No	<p>Inspect the fuel injector.</p> <p>(See <b>FUEL INJECTOR INSPECTION [LF].</b>)</p> <p>If the fuel injector is normal, replace the fuel pump unit.</p> <p>(See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF].</b>)</p>
11	<p>Disconnect a vacuum hose from purge solenoid valve and plug opening end of vacuum hose.</p> <p>Start engine.</p> <p>Is starting condition improved?</p>	Yes	Inspect if the purge solenoid valve is stuck open.
		No	Go to the next step.
12	<p>Inspect the MAF sensor for following:</p> <ul style="list-style-type: none"> <li>• Contamination</li> <li>• MAF sensor terminal B voltage (GND circuit)</li> </ul> <p>Is there any contamination?</p>	Yes	Repair or replace the malfunctioning part.
		No	Go to the next step.
13	<p>Visually inspect the exhaust system part.</p> <p>Is there any deformed exhaust system part?</p>	Yes	Replace the suspected part.
		No	Go to the next step.
14	<p>Inspect engine condition while tapping EGR valve housing. Does engine condition improve?</p>	Yes	<p>Replace the EGR valve.</p> <p>(See <b>EGR VALVE REMOVAL/INSTALLATION [LF].</b>)</p>
		No	Go to the next step.
15	<p>Inspect the starting system.</p> <p>(See <b>STARTER INSPECTION [LF].</b>)</p>	Yes	<p>Inspect for loose connectors or poor terminal contact.</p> <p>If there is no malfunction, remove EGR</p>



	Is starting system normal?		valve and visually inspect for mechanically stuck EGR valve.
		No	Repair or replace components as required.
16	<ul style="list-style-type: none"> <li>• Verify test results. <ul style="list-style-type: none"> <li>▪ If normal, return to diagnostic index to service any additional symptoms. (See <a href="#">SYMPTOM DIAGNOSTIC INDEX [LF]</a>.)</li> <li>▪ If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. <ul style="list-style-type: none"> <li>• If vehicle is repaired, troubleshooting completed.</li> <li>• If vehicle is not repaired or additional diagnostic information is not available, Replace the PCM. (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a>.)</li> </ul> </li> </ul> </li> </ul>		

2008 - MX-5 - Engine

NO.5 ENGINE STALLS-AFTER START/AT IDLE [LF]

5	ENGINE STALLS—AFTER START/AT IDLE
DESCRIPTION	<ul style="list-style-type: none"><li>• Engine stops unexpectedly.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• A/C system operation is improper</li><li>• Air leakage from intake-air system parts</li><li>• Purge solenoid valve malfunction</li><li>• Improper operation of electronic throttle control system</li><li>• EGR valve malfunction</li><li>• No signal from CKP sensor due to sensor, related wire or wrong installation</li><li>• Vacuum leakage</li><li>• Engine overheating</li><li>• Low engine compression</li><li>• Erratic signal to ignition coil</li><li>• Poor fuel quality</li><li>• PCV valve malfunction</li><li>• Air cleaner restriction</li><li>• Restriction in exhaust system</li><li>• Electrical connector disconnection</li><li>• Open or short circuit in fuel pump body and related wiring harness</li><li>• No battery power supply to PCM or poor GND</li><li>• Inadequate fuel pressure</li><li>• Fuel pump body mechanical malfunction</li><li>• Fuel leakage from fuel injector</li><li>• Fuel injector clogging</li><li>• Ignition coil malfunction</li></ul>

- Improper air/fuel mixture ratio control
- Improper valve timing
- Improper operation variable valve timing control system
- Immobilizer system and/or circuit malfunction
- Immobilizer system operating property. (Ignition key is not registered.)
- Pressure regulator malfunction (built-in fuel pump unit)

**WARNING:**

The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:

- Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.
- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.

(See **BEFORE SERVICE PRECAUTION [LF]**.)

(See **AFTER SERVICE PRECAUTION [LF]**.)

**CAUTION:**

- **Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.**

**Diagnostic procedure**

STEP	INSPECTION	RESULTS	ACTION
1	Connect the M-MDS to the DLC-2. Do the following conditions appear? <ul style="list-style-type: none"> <li>• The engine is not completely started.</li> <li>• DTC P1260 is displayed.</li> </ul>	Yes	<b>Both conditions appear:</b> Go to Step 3.
		No	<b>Either or other condition appears:</b> Go to the next step.
2	Does the engine stall after <b>approx. 2 s</b> since the engine is started?	Yes	Go to the next step.
		No	Immobilizer system is normal. Go to Step 8.
3	Is coil connector securely connected to coil?	Yes	Go to the next step.

		No	Connect the coil connector securely. Return to Step 2.
4	Does the security light flush?	Yes	Go to the next step.
		No	Inspect and repair or replace the following: <ul style="list-style-type: none"> <li>• Wiring harnesses and connectors from keyless control module terminal 3F and instrument cluster terminal 2F</li> <li>• Instrument cluster</li> </ul> (See <a href="#">INSTRUMENT CLUSTER INSPECTION</a> .)
5	Connect the M-MDS to the DLC-2 and retrieve DTC for PCM, instrument cluster and keyless control module (with advanced keyless entry system).  Are any of the following DTCs displayed?  <b>DTC</b> <ul style="list-style-type: none"> <li>• <b>PCM: B1342, U0073, U0155</b></li> <li>• <b>Instrument cluster: B1213, B1600, B1601, B1602, B1681, B2103, 2139, B2431, U0110, U0214</b></li> <li>• <b>Keyless control module (with advanced keyless entry system): B1681, B2103, B1213</b></li> </ul>	Yes	Go to the appropriate DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .)
		No	Go to the next step.
6	Inspect for the following wiring harnesses and connectors:  <b>With advanced keyless entry system</b> <ul style="list-style-type: none"> <li>• Between coil terminal A and keyless control module terminal 3Y</li> <li>• Between coil terminal B and keyless control module terminal 3AA</li> <li>• Between keyless control module terminal 4A and instrument cluster terminal 2Q</li> </ul>	Yes	Repair or replace the suspected wiring harness and connector.
		No	Go to the next step.

	<p>Between keyless control module terminal 4C and instrument cluster terminal 2S</p> <p><b>Without advanced keyless entry system</b></p> <ul style="list-style-type: none"> <li>Between coil terminal A and instrument cluster terminal 2S</li> <li>Between coil terminal B and instrument cluster terminal 2Q</li> </ul> <p>Is there any malfunction?</p>		
7	<p>Inspect for the following wiring harnesses and connectors:</p> <ul style="list-style-type: none"> <li>Between PCM terminal 1AM and instrument cluster terminal 1J</li> <li>Between PCM terminal 1AI and instrument cluster terminal 1L</li> </ul> <p>Is there any malfunction?</p>	Yes	Repair or replace the suspected wiring harness and connector.
		No	Go to the next step.
8	<p>Verify the following:</p> <ul style="list-style-type: none"> <li>Vacuum connection</li> <li>Air cleaner element</li> <li>No air leakage from intake-air system</li> <li>No restriction of intake-air system</li> <li>Proper sealing of intake manifold and components attached to intake manifold:</li> </ul> <p>EGR valve</p> <ul style="list-style-type: none"> <li>Ignition wiring</li> <li>Fuel quality: proper octane, contamination, winter/summer blend</li> <li>Electrical connections</li> <li>Smooth operation of throttle valve</li> </ul> <p>Are all items normal?</p>	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 8.
9	<p>Connect the M-MDS to the DLC-2.</p> <p>Access the APP1 and APP2 PIDs. Crank the engine with accelerator pedal released.</p>	Yes	Go to the next step.
		No	Inspect for the following:

		<ul style="list-style-type: none"> <li>• APP sensor</li> <li>• Wiring harnesses and connectors for following: <ul style="list-style-type: none"> <li>▪ PCM terminal 1AJ— APP sensor terminal A</li> <li>▪ PCM terminal 1AV— APP sensor terminal B</li> <li>▪ PCM terminal 1AP— APP sensor terminal C</li> <li>▪ PCM terminal 1AL— APP sensor terminal D</li> <li>▪ PCM terminal 1AS— APP sensor terminal E</li> <li>▪ PCM terminal 1AO— APP sensor terminal F</li> </ul> </li> </ul>
10 Connect the M-MDS to the DLC-2.  Access the TP PID. Crank the engine with accelerator pedal released.	Yes	Go to the next step.
	No	Inspect for the following:

<p>Are the TP PID indicates the closed throttle position?</p>	<p>TP sensor</p> <ul style="list-style-type: none"><li>• Wiring harnesses and connectors for following:<ul style="list-style-type: none"><li>▪ PCM terminal 2AK—TP sensor terminal F</li><li>▪ PCM terminal 2AO—TP sensor terminal E</li><li>▪ PCM terminal 2AP—TP sensor terminal C</li><li>▪ PCM terminal 2AL—TP sensor terminal D</li></ul></li></ul>
<p>11 Connect the M-MDS to the DLC-2.</p> <p>Turn the ignition switch to the ON position (Engine off).</p> <p>Retrieve any DTCs.</p> <p>Are there any DTCs displayed?</p>	<p>Yes</p> <p><b>DTC is displayed:</b></p> <p>Go to appropriate DTC inspection.</p> <p>(See <a href="#">DTC TABLE [LF]</a>.)</p> <p><b>Communication error message is displayed:</b></p> <p>Inspect for the following:</p> <ul style="list-style-type: none"><li>• Open circuit in wiring harness between main relay and PCM terminal 1AW or 1BE</li><li>• Open main relay GND circuit</li><li>• Main relay is stuck open.</li><li>• Open or short circuit in wiring harness between DLC and PCM terminals</li></ul>

			<p>1AM or 1AI</p> <ul style="list-style-type: none"> <li>• Open or poor GND circuit (PCM terminal 1AZ, 1BB, 1BD, 1BH)</li> <li>• Poor connection of vehicle body GND</li> </ul>
		No	<p><b>No DTC is displayed:</b></p> <p>Go to the next step.</p>
12	<p>Attempt to start engine at part throttle.</p> <p>Does engine run smoothly at part throttle?</p>	Yes	<p>Inspect electronic throttle control system operation.</p> <p>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b>.)</p>
		No	Go to the next step.
13	<p>Connect the M-MDS to the DLC-2.</p> <p>Access RPM PID.</p> <p>Is RPM PID indicating engine speed during engine cranking?</p>	Yes	Go to the next step.
		No	<p>Inspect for the following:</p> <ul style="list-style-type: none"> <li>• Open or short circuit in CKP sensor</li> <li>• Open or short circuit in wiring harness between CKP sensor terminal A and PCM terminal 2AB</li> <li>• Open or short circuit in wiring harness between CKP sensor terminal B and PCM terminal 2W</li> <li>• Open or short circuit in wiring harness between CKP sensor terminal C and PCM terminal 2AQ</li> <li>• Open or short circuit in CKP sensor wiring harnesses</li> </ul> <p>If CKP sensor and wiring harness are normal, go to the next step.</p>
14	<p>Visually inspect CKP sensor and teeth of crankshaft pulley.</p> <p>Are CKP sensor and teeth of crankshaft pulley normal?</p>	Yes	Go to the next step.
		No	Replace the malfunctioning part.



15	Inspect the ignition coil related wiring harness condition (intermittent open or short circuit) for all cylinders. Are wiring harness conditions normal?	Yes	Go to the next step.
		No	Repair the wiring harnesses.
16	Perform the spark test.  (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b> .)  Is strong blue spark visible at each cylinder?	Yes	Go to the next step.  If symptoms occurs with the A/C on, go to Step 22.
		No	Repair or replace the malfunctioning part according to spark test result.
17	Inspect the spark plug condition.  Is spark plug wet, covered with carbon or grayish white?	Yes	<b>Spark plug is wet or covered with carbon:</b>  Inspect for fuel leakage from injector.  <b>Spark plug is grayish white:</b>  Inspect the fuel injector for clogging.
		No	Install spark plugs on original cylinders.  Go to the next step.
18	Remove and shake the PCV valve.  Does the PCV valve rattle?	Yes	Go to the next step.
		No	Replace the PCV valve.
19	visually inspect the exhaust system part.  Is there any deformed exhaust system part?	Yes	Replace the suspected part.
		No	Go to the next step.
20	Install the fuel pressure gauge between the fuel pipe and the fuel distributor.  Short check connector terminal F/P to body GND using a jumper wiring.  Turn the ignition switch to the ON position.  Is fuel line pressure correct with ignition switch ON?  (See <b>FUEL LINE PRESSURE INSPECTION [LF]</b> .)	Yes	Go to the next step.
		No	<b>Zero or low:</b>  Inspect the fuel pump relay and fuel pump circuit.  Inspect the fuel line for clogging.  If there is no malfunction, replace the fuel pump unit.  (See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF]</b> .)  <b>High:</b>  Replace the fuel pump unit.  (See <b>FUEL PUMP UNIT</b>

			<b>REMOVAL/INSTALLATION [LF].)</b>
21	<p>Visually inspect for fuel leakage at fuel injector O-ring and fuel line.</p> <p>Service if necessary.</p> <p>Is fuel line pressure held after ignition switch is turned off?</p> <p>(See <b>FUEL LINE PRESSURE INSPECTION [LF].)</b></p>	Yes	Go to the next step.
		No	<p>Inspect the fuel injector.</p> <p>If the fuel injector is normal, replace the fuel pump unit.</p> <p>(See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF].)</b></p>
22	<p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>The following test is for stall concerns with the A/C on. If other symptoms exist, go to the next step.</li> </ul> <p>Connect pressure gauges to A/C low and high pressure side lines.</p> <p>Turn A/C on and measure low side and high side pressures.</p> <p>Are pressures within specifications?</p> <p>(See <b>REFRIGERANT PRESSURE CHECK.</b>)</p>	Yes	Go to the next step.
		No	<p>If A/C is always on, go to symptom troubleshooting "No.24 A/C is always on or A/C compressor runs continuously".</p> <p>(See <b>NO.24 A/C IS ALWAYS ON/A/C COMPRESSOR RUNS CONTINUOUSLY [LF].)</b></p> <p>For other symptoms, inspect the following:</p> <ul style="list-style-type: none"> <li>Refrigerant charging amount</li> <li>Condenser fan operation</li> </ul>
23	<p>Disconnect the vacuum hose between the purge solenoid valve and the intake manifold from purge solenoid side.</p> <p>Plug opening end of vacuum hose.</p> <p>Start the engine.</p> <p>Is the engine stall now eliminated?</p>	Yes	<p>Inspect if purge solenoid valve is stuck open.</p> <p>Inspect evaporative emission control system.</p>
		No	Go to the next step.
24	<p>Is air leakage felt or heard at intake-air system components while racing the engine to higher speed?</p>	Yes	Repair or replace the malfunctioning part.
		No	Go to the next step.
25	<p>Inspect the engine condition while tapping EGR valve housing.</p> <p>Does the engine condition improve?</p>	Yes	Replace the EGR valve.
		No	Go to the next step.
26	<p>Inspect variable valve timing control system operation.</p> <p>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF].)</b></p>	Yes	Go to the next step.
		No	Repair or replace the malfunctioning parts according to variable valve timing control system operation inspection

	Does variable valve timing control function properly?		results.
27	Is the engine compression correct?	Yes	Inspect the valve timing.
		No	Inspect for cause.
28	<ul style="list-style-type: none"><li>• Verify test results.<ul style="list-style-type: none"><li>▪ If normal, return to diagnostic index to service any additional symptoms. (See <a href="#">SYMPTOM DIAGNOSTIC INDEX [LF]</a>.)</li><li>▪ If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.<ul style="list-style-type: none"><li>• If vehicle is repaired, troubleshooting completed.</li><li>• If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a>.)</li></ul></li></ul></li></ul>		

## 2008 - MX-5 - Engine

### NO.6 CRANKS NORMALLY BUT WILL NOT START [LF]

6	CRANKS NORMALLY BUT WILL NOT START
DESCRIPTION	<ul style="list-style-type: none"><li>• The starter cranks engine at normal speed but the engine will not run.</li><li>• Refer to symptom troubleshooting "No.5 Engine stalls" if this symptom appears after engine stall.</li><li>• Fuel is in tank.</li><li>• Battery is in normal condition.</li></ul>
	<ul style="list-style-type: none"><li>• No battery power supply to PCM</li><li>• Air leakage from intake-air system</li><li>• Open PCM GND or vehicle body GND</li><li>• Improper operation of electronic throttle control system</li><li>• EGR valve malfunction</li><li>• No signal from CKP sensor due to sensor, related wire or incorrect installation</li><li>• No signal from CMP sensor due to sensor, related wire or incorrect installation</li><li>• Low engine compression</li><li>• Engine overheating</li><li>• Vacuum leakage</li><li>• Erratic signal to ignition coil</li><li>• Improper air/fuel mixture ratio control</li><li>• Poor fuel quality</li><li>• PCV valve malfunction</li><li>• Restriction in intake-air system</li><li>• Restriction in exhaust system</li><li>• Disconnected electrical connector</li><li>• Open or short circuit in fuel pump body and related wiring harness</li></ul>

## POSSIBLE CAUSE

- Inadequate fuel pressure
- Fuel pump mechanical malfunction
- Fuel leakage from injector
- Fuel injector is clogged.
- Purge solenoid valve malfunction
- Spark plug malfunction
- Ignition coil malfunction
- Improper variable valve timing control system operation
- Improper valve timing
- Immobilizer system and/or circuit malfunction
- Immobilizer system operating properly. (Ignition key is not registered.)
- Pressure regulator malfunction (built-in fuel pump unit)

### WARNING:

The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:

- Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.
- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.

(See **BEFORE SERVICE PRECAUTION [LF].**)

(See **AFTER SERVICE PRECAUTION [LF].**)

### CAUTION:

- Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.

## Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect the M-MDS to the DLC-2.  Do any of the following conditions appear? <ul style="list-style-type: none"><li>• Engine does not completely start.</li><li>• DTC P1260 is displayed.</li></ul>	Yes	<b>Both conditions appear:</b>  Go to Step 3.
		No	<b>Either or other condition appears:</b>

			Go to the next step.
2	Does engine stall after <b>approx. 2 s</b> from when it is started?	Yes	Go to the next step.
		No	Immobilizer system is normal. Go to Step 8.
3	Is the coil connector securely connected to the coil?	Yes	Go to the next step.
		No	Connect the coil connector securely. Return to Step 2.
4	Does the security light flush?	Yes	Go to the next step.
		No	Inspect and repair or replace the following: <ul style="list-style-type: none"> <li>• Wiring harnesses and connectors from keyless control module terminal 3F and instrument cluster terminal 2F</li> <li>• Instrument cluster</li> </ul> (See <b>INSTRUMENT CLUSTER INSPECTION</b> .)
5	Connect the M-MDS to the DLC-2 and retrieve the DTC for PCM, instrument cluster and keyless control module (with advanced keyless entry system).  Are any of the following DTCs displayed?  <b>DTC</b> <ul style="list-style-type: none"> <li>• <b>PCM: B1342, U0073, U0155</b></li> <li>• <b>Instrument cluster: B1213, B1600, B1601, B1602, B1681, B2103, B2139, B2431, U0100, U0214</b></li> <li>• <b>Keyless control module (with advanced keyless entry system): B1681, B2103, B1213</b></li> </ul>	Yes	Go to the appropriate DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	Go to the next step.
6	Inspect the following wiring harnesses and connectors:  <b>With advanced keyless entry system</b>	Yes	Repair or replace the suspected wiring harness and connector.
		No	Go to the next step.

	<ul style="list-style-type: none"> <li>Between coil terminal A and keyless control module terminal 3Y</li> <li>Between coil terminal B and keyless control module terminal 3AA</li> <li>Between keyless control module terminal 4A and instrument cluster terminal 2Q</li> <li>Between keyless control module terminal 4C and instrument cluster terminal 2S</li> </ul> <p><b>Without advanced keyless entry system</b></p> <ul style="list-style-type: none"> <li>Between coil terminal A and instrument cluster terminal 2S</li> <li>Between coil terminal B and instrument cluster terminal 2Q</li> </ul> <p>Is there any malfunction?</p>		
7	<p>Inspect the following wiring harnesses and connectors:</p> <ul style="list-style-type: none"> <li>Between PCM terminal 1AM and instrument cluster terminal 1J</li> <li>Between PCM terminal 1AI and instrument cluster terminal 1L</li> </ul> <p>Is there any malfunction?</p>	Yes	Repair or replace the suspected wiring harness and connector.
		No	Go to the next step.
8	<p>Verify the following:</p> <ul style="list-style-type: none"> <li>Vacuum connection</li> <li>External fuel shut off or accessory (such as kill switch, alarm)</li> <li>Fuel quality: proper octane, contamination, winter/summer blend</li> <li>No air leakage from intake-air system</li> <li>Intake-air system restriction (such as air cleaner element, fresh air duct)</li> <li>Proper sealing of intake manifold and components attached to intake manifold: EGR valve</li> </ul>	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 8.

	<ul style="list-style-type: none"><li>• Ignition wiring</li><li>• Electrical connections</li><li>• Fuses</li><li>• Smooth operation of throttle valve</li></ul> <p>Are all items normal?</p>		
9	Connect the M-MDS to the DLC-2.  Turn the ignition switch to the ON position (Engine off).  Retrieve any DTCs.  Are there any DTCs displayed?	Yes	<p><b>DTC is displayed:</b></p> <p>Go to the appropriate DTC inspection. (See <a href="#">DTC TABLE [LF]</a>.)</p> <p><b>Communication error message is displayed:</b></p> <p>Inspect for the following:</p> <ul style="list-style-type: none"><li>• Open circuit in wiring harness between main relay and PCM terminal 1AW or 1BE</li><li>• Open main relay GND circuit</li><li>• Open or short circuit in wiring harness between DLC and PCM terminal 1AM or 1AI</li><li>• Main relay is stuck open.</li><li>• Open or poor GND circuit (PCM terminal 1AZ, 1BB, 1BD, 1BH)</li><li>• Poor connection of vehicle body GND</li></ul>
		No	<p><b>No DTC is displayed:</b></p> <p>Go to the next step.</p>
10	Connect the M-MDS to the DLC-2.  Access the APP1 and APP2 PIDs. Crank the engine with accelerator pedal released.  Are the APP1 and APP2 PIDs indicating that the accelerator pedal is in the released position?	Yes	Go to the next step.
		No	<p>Inspect for the following:</p> <ul style="list-style-type: none"><li>• APP sensor</li><li>• Wiring harnesses and connectors for following:<ul style="list-style-type: none"><li>▪ PCM terminal 1AJ—</li></ul></li></ul>



			<div>APP sensor terminal A</div> <div>▪ PCM terminal 1AV—APP sensor terminal B</div> <div>▪ PCM terminal 1AP—APP sensor terminal C</div> <div>▪ PCM terminal 1AL—APP sensor terminal D</div> <div>▪ PCM terminal 1AS—APP sensor terminal E</div> <div>▪ PCM terminal 1AO—APP sensor terminal F</div>
11	<div>Connect the M-MDS to the DLC-2.</div> <div>Access the TP PID. Crank the engine with accelerator pedal released.</div> <div>Are the TP PID indicates the closed throttle position?</div>	Yes	Go to the next step.
		No	<div>Inspect for the following:</div> <div><div>• TP sensor</div><div>• Wiring harnesses and connectors for following:<div>▪ PCM terminal 2AK—</div></div></div>

			TP sensor terminal F <ul style="list-style-type: none"> <li>▪ PCM terminal 2AO— TP sensor terminal E</li> <li>▪ PCM terminal 2AP—TP sensor terminal C</li> <li>▪ PCM terminal 2AL—TP sensor terminal D</li> </ul>
12	Does the engine start with the throttle valve closed?	Yes	Go to Step 28.
		No	Go to the next step.
13	Will the engine start and run smoothly at part throttle?	Yes	Inspect the electronic throttle control system operation.  (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b> .)
		No	Go to the next step.
14	Connect the M-MDS to the DLC-2.  Access RPM PID.  Is RPM PID indicating the engine speed when cranking the engine?	Yes	Go to the next step.
		No	Inspect for the following: <ul style="list-style-type: none"> <li>• Open or short circuit in CKP sensor</li> <li>• Open or short circuit in wiring harness between CKP sensor terminal A and PCM terminal 2AB</li> <li>• Open or short circuit in wiring harness between CKP sensor terminal B and PCM terminal 2W</li> </ul>

			<ul style="list-style-type: none"> <li>• Open or short circuit in wiring harness between CKP sensor terminal C and PCM terminal 2AQ</li> <li>• Open or short circuit in CKP sensor wiring harnesses</li> </ul> <p>If CKP sensor and wiring harness are normal, go to the next step.</p>
15	Visually inspect the CKP sensor and teeth of crankshaft pulley.	Yes	Go to the next step.
	Are CKP sensor and teeth of crankshaft pulley normal?	No	Replace the malfunctioning part.
16	Inspect the ignition coil related wiring harness condition (intermittent open or short circuit) for all cylinders. Are wiring harness conditions normal?	Yes	Go to the next step.
		No	Repair the wiring harnesses.
17	Perform the spark test.  (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b> .)  Is strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to spark test result.
18	Inspect the spark plug conditions.  Is spark plug wet, covered with carbon or grayish white?	Yes	<b>Spark plug is wet or covered with carbon:</b>  Inspect for fuel leakage from injector.  <b>Spark plug is grayish white:</b>  Inspect the fuel injector for clogging.
		No	Install the spark plugs on original cylinders.  Go to the next step.
19	Remove and shake the PCV valve.  Does the PCV valve rattle?	Yes	Go to the next step.
		No	Replace the PCV valve.
20	visually inspect the exhaust system part.  Is there any deformed exhaust system part?	Yes	Replace the suspected part.
		No	Go to the next step.
21	Install the fuel pressure gauge between the fuel	Yes	Go to the next step.

	<p>pipe and the fuel distributor.</p> <p>Short check connector terminal F/P to body GND using a jumper wiring.</p> <p>Turn the ignition switch to the ON position.</p> <p>Is fuel line pressure correct when ignition switch is turned on/off <b>five times</b>?</p> <p>(See <b>FUEL LINE PRESSURE INSPECTION [LF]</b>.)</p>		
		No	<p><b>Zero or low:</b></p> <p>Inspect the fuel pump relay and fuel pump circuit.</p> <p>Inspect the fuel line for clogging.</p> <p>If there is no malfunction, replace the fuel pump unit.</p> <p>(See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF]</b>.)</p> <p><b>High:</b></p> <p>Replace the fuel pump unit.</p> <p>(See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF]</b>.)</p>
22	<p>Visually inspect the fuel injector O-ring and fuel line for fuel leakage.</p> <p>Service if necessary.</p> <p>Is the fuel line pressure held after the ignition switch is turned off?</p> <p>(See <b>FUEL LINE PRESSURE INSPECTION [LF]</b>.)</p>	Yes	Go to the next step.
		No	<p>Inspect the fuel injector.</p> <p>If the fuel injector is normal, replace the fuel pump unit.</p> <p>(See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF]</b>.)</p>
23	<p>Disconnect the vacuum hose between the purge solenoid valve and the intake manifold from purge solenoid valve side.</p> <p>Plug opening end of vacuum hose.</p> <p>Start the engine.</p> <p>Is starting condition improved?</p>	Yes	<p>Inspect if the purge solenoid valve is stuck open mechanically.</p> <p>Inspect the evaporative emission control system.</p>
		No	Go to the next step.
24	<p>Is air leakage felt or heard at intake-air system components while racing engine to higher speed?</p>	Yes	Repair or replace the malfunctioning part.
		No	Go to the next step.
25	<p>Inspect the engine condition while tapping EGR valve housing.</p> <p>Is engine condition improved?</p>	Yes	Replace the EGR valve.
		No	Go to the next step.
26	<p>Inspect the variable valve timing control system operation.</p> <p>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b>.)</p>	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part.

	Does variable valve timing control function properly?		
27	Is the engine compression correct?	Yes	Inspect the valve timing.
		No	Inspect for causes.
28	<ul style="list-style-type: none"><li>• Verify test results.<ul style="list-style-type: none"><li>▪ If normal, return to diagnostic index to service any additional symptoms. (See <a href="#">SYMPTOM DIAGNOSTIC INDEX [LF]</a>.)</li><li>▪ If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.<ul style="list-style-type: none"><li>• If vehicle is repaired, troubleshooting completed.</li><li>• If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a>.)</li></ul></li></ul></li></ul>		

## 2008 - MX-5 - Engine

### NO.7 SLOW RETURN TO IDLE [LF]

7	SLOW RETURN TO IDLE
<b>DESCRIPTION</b>	Engine takes more time than normal to return to idle speed.
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• ECT sensor malfunction</li> <li>• Thermostat is stuck open.</li> <li>• Throttle body malfunction</li> <li>• Air leakage from intake-air system</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect the M-MDS to the DLC-2.  Turn the ignition switch to the ON position (Engine off).  Retrieve any DTCs.  Are there any DTCs displayed?	Yes	<b>DTC is displayed:</b>  Go to the appropriate DTC inspection.  (See <a href="#">DTC TABLE [LF]</a> .)
		No	<b>No DTC is displayed:</b>  Go to the next step.
2	Remove thermostat and inspect operation.  <ul style="list-style-type: none"> <li>• (See <a href="#">THERMOSTAT REMOVAL/INSTALLATION [LF]</a>.)</li> <li>• (See <a href="#">THERMOSTAT INSPECTION [LF]</a>.)</li> </ul> Is thermostat normal?	Yes	ECT and thermostat are normal.  Go to the next step.
		No	Access ECT PID on the M-MDS.  Inspect for both ECT PID and temperature gauge on instrument cluster readings.  If temperature gauge on instrument cluster indicates normal range but ECT PID is not same as temperature gauge reading, inspect ECT sensor.  If temperature gauge on instrument cluster indicates cold range but ECT PID is normal, inspect

			temperature gauge and heat gauge unit.
3	Is throttle body free of contamination?	Yes	Inspect for air leakage from the intake-air system components while racing the engine to higher speed.
		No	Clean or replace throttle body.
4	<ul style="list-style-type: none"> <li>• Verify test results. <ul style="list-style-type: none"> <li>▪ If normal, return to diagnostic index to service any additional symptoms. (See <a href="#">SYMPTOM DIAGNOSTIC INDEX [LF]</a>.)</li> <li>▪ If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. <ul style="list-style-type: none"> <li>• If vehicle is repaired, troubleshooting completed.</li> <li>• If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a>.)</li> </ul> </li> </ul> </li> </ul>		

## 2008 - MX-5 - Engine

### NO.8 ENGINE RUNS ROUGH/ROLLING IDLE [LF]

8	ENGINE RUNS ROUGH/ROLLING IDLE
DESCRIPTION	<ul style="list-style-type: none"><li>• Engine speed fluctuates between specified idle speed and lower speed and engine shakes excessively.</li><li>• Idle speed is too slow and engine shakes excessively.</li></ul>
	<ul style="list-style-type: none"><li>• Air leakage from intake-air system parts</li><li>• A/C system operation is improper</li><li>• Erratic signal to ignition coil</li><li>• Spark plug malfunction</li><li>• Purge solenoid valve malfunction</li><li>• Improper operation of electronic throttle control system</li><li>• Idle learning of electronic throttle control system is not completed</li><li>• EGR valve malfunction</li><li>• Erratic or no signal from CMP sensor</li><li>• Low engine compression</li><li>• Improper valve timing</li><li>• Improper variable valve timing control system operation</li><li>• Erratic signal from CKP sensor</li><li>• Improper air / fuel mixture ratio control operation (abnormal signal from MAF sensor or HO2S)</li><li>• Open or short circuit in PCM GND circuit</li><li>• Poor fuel quality</li><li>• PCV valve malfunction</li><li>• Air cleaner restriction</li><li>• Restriction in exhaust system</li><li>• Disconnected electrical connectors</li></ul>



## POSSIBLE CAUSE

- Inadequate fuel pressure
- Fuel pump body mechanical malfunction
- Improper load signal input
- Fuel line restriction or clogging
- Improper fuel injection control operation
- Fuel leakage from fuel injector
- Fuel injector clogging
- Engine overheating
- Vacuum leakage
- Pressure regulator malfunction (built-in fuel pump unit)

### WARNING:

The following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before servicing the fuel system:

- Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.
- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.

(See **BEFORE SERVICE PRECAUTION [LF].**)

(See **AFTER SERVICE PRECAUTION [LF].**)

### CAUTION:

- Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.

## Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Warm up the engine. Idle the engine for <b>5 min.</b> Is the symptom disappeared?	Yes	Troubleshooting completed. (Cause of this symptom is that the idle learning of electronic throttle control system is not completed.)
		No	Go to the next step.
2	Verify the following: <ul style="list-style-type: none"><li>• External fuel shut off or accessory</li></ul>	Yes	Go to the next step.

	<p>(such as kill switch, alarm)</p> <ul style="list-style-type: none"><li>• Fuel quality (such as proper octane, contamination, winter/summer blend)</li><li>• No air leakage from intake-air system</li><li>• Proper sealing of intake manifold and components attached to intake manifold: EGR valve</li><li>• Ignition wiring</li><li>• Electrical connections</li><li>• Fuses</li><li>• Smooth operation of throttle valve</li><li>• PCM GND circuit (1AZ, 1BB, 1BD, 1BH)</li></ul> <p>Are all items normal?</p>	No	<p>Service if necessary.</p> <p>Repeat Step 2.</p>
3	<p>Connect the M-MDS to the DLC-2.</p> <p>Turn the ignition switch to the ON position (Engine off).</p> <p>Retrieve any DTCs.</p> <p>Are there any DTCs displayed?</p>	Yes	<p><b>DTC is displayed:</b></p> <p>Go to the appropriate DTC inspection.</p> <p>(See <a href="#">DTC TABLE [LF]</a>.)</p>
		No	<p><b>No DTC is displayed:</b></p> <p>Go to the next step.</p>
4	<p>Is the engine overheating?</p>	Yes	<p>Go to symptom troubleshooting "No.17 Cooling system concerns - Overheating".</p>
		No	<p>Go to the next step.</p>
5	<p>Connect the M-MDS to the DLC-2.</p> <p>Access MAF PID.</p> <p>Drive vehicle with monitoring PID. Is MAF PID within specification?</p>	Yes	<p>Go to the next step.</p>
		No	<p>Inspect for open or short circuit of MAF sensor and related wiring harness.</p>
6	<p><b>NOTE:</b></p> <ul style="list-style-type: none"><li>• The following test is for engine running at rough idle with A/C on. If other symptoms exist, go to the next step.</li></ul> <p>Connect pressure gauge to A/C low and high pressure side lines.</p>	Yes	<p>Go to the next step.</p>
		No	<p>If the A/C is always on, go to symptom troubleshooting "No.24 A/C is always on or A/C compressor runs continuously".</p> <p>For other symptoms, inspect the following:</p>

	<p>Start engine and idle it.</p> <p>Turn the A/C switch on.</p> <p>Measure low side and high side pressures.</p> <p>Are pressures within specifications?</p> <p>(See <b>REFRIGERANT PRESSURE CHECK</b>.)</p>		<ul style="list-style-type: none"> <li>Refrigerant charging amount</li> <li>Condenser fan operation</li> </ul>
7	<p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>The following test is for engine running rough with P/S on. If other symptoms exist, go to the next step.</li> </ul> <p>Connect the M-MDS to the DLC-2.</p> <p>Start the engine and idle it.</p> <p>Retrieve any DTCs for EPS.</p> <p>Is there any EPS DTC displayed?</p>	Yes	Go to appropriate the DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	Go to the next step.
8	<p>Visually inspect the CKP sensor and teeth of crankshaft pulley.</p> <p>Are the CKP sensor and teeth of crankshaft pulley normal?</p>	Yes	Go to the next step.
		No	Replace the malfunctioning part.
9	<p>Inspect the ignition coil related wiring harness condition (intermittent open or short circuit) for all cylinders. Are wiring harness conditions normal?</p>	Yes	Go to the next step.
		No	Repair the wiring harnesses.
10	<p>Inspect the spark plug condition.</p> <p>Is the spark plug wet, covered with carbon or grayish white?</p>	Yes	<p><b>Spark plug is wet or covered with carbon:</b></p> <p>Inspect for fuel leakage from injector.</p> <p><b>Spark plug is grayish white:</b></p> <p>Inspect the fuel injector for clogging.</p>
		No	<p>Install the spark plugs on original cylinders.</p> <p>Go to the next step.</p>
11	<p>Perform the electronic throttle control system operation inspection.</p> <p>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b>.)</p> <p>Does the electronic throttle control system function</p>	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to electronic throttle control system operation inspection results.

	properly?		
12	<p>Install fuel pressure gauge between fuel pipe and fuel distributor.</p> <p>Start the engine and run it at idle.</p> <p>Measure fuel line pressure during idle.</p> <p>Is fuel line pressure correct during idle?</p> <p>(See <b>FUEL LINE PRESSURE INSPECTION [LF]</b>.)</p>	Yes	Go to the next step.
		No	<p><b>Low:</b></p> <p>Inspect the fuel line for clogging.</p> <p>If there is no malfunction, replace fuel pump unit.</p> <p>(See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF]</b>.)</p> <p><b>High:</b></p> <p>Replace the fuel pump unit.</p> <p>(See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF]</b>.)</p>
13	<p>Visually inspect for fuel leakage at fuel injector, O-ring, and fuel line.</p> <p>Service if necessary.</p> <p>Does fuel line pressure hold after ignition switch is turned off?</p> <p>(See <b>FUEL LINE PRESSURE INSPECTION [LF]</b>.)</p>	Yes	Go to the next step.
		No	<p>Inspect fuel injector.</p> <p>If fuel injector is normal, replace fuel pump unit.</p>
14	<p>Connect the M-MDS to the DLC-2.</p> <p>Start the engine and idle it.</p> <p>Access LONG FT1 PID.</p> <p>Measure LONG FT1 PID at idle.</p> <p>Is PID value normal? (See <b>PCM INSPECTION [LF]</b>.)</p>	Yes	Go to the next step.
		No	<p>LONG FT1 PID is out of specification.</p> <p>Less than specification (too rich):</p> <ul style="list-style-type: none"> <li>• Inspect EVAP control system. <ul style="list-style-type: none"> <li>▪ If system is normal, go to Step 16.</li> </ul> </li> </ul> <p>Greater than specification (too lean):</p> <ul style="list-style-type: none"> <li>• Inspect for air leakage at intake-air system components. <ul style="list-style-type: none"> <li>▪ If system is</li> </ul> </li> </ul>

			normal, go to the next step.
15	Disconnect the vacuum hose between the purge solenoid valve and the intake manifold from purge solenoid valve side.  Plug opening end of vacuum hose.  Start the engine.  Does the engine condition improve?	Yes	Check if purge solenoid valve is stuck open mechanically.  Inspect EVAP control system.
		No	Go to the next step.
16	Remove and shake the PCV valve.  Does the PCV valve rattle?	Yes	Go to the next step.
		No	Replace the PCV valve.
17	Visually inspect the exhaust system part.  Is there any deformed exhaust system part?	Yes	Replace the suspected part.
		No	Go to the next step.
18	Visually inspect the CMP sensor and teeth of camshaft.  Are the CMP sensor and teeth of camshaft normal?	Yes	Go to the next step.
		No	Replace the malfunctioning part.
19	Inspect the engine condition while tapping EGR valve housing.  Does the engine condition improve?	Yes	Replace the EGR valve.
		No	Go to the next step.
20	Inspect variable valve timing control system operation.  (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b> .)  Does variable valve timing control system function properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part.
21	Is engine compression correct?	Yes	Inspect the valve timing.  (See <b>VARIABLE VALVE TIMING ACTUATOR INSPECTION [LF]</b> .)
		No	Inspect for causes.
22	<ul style="list-style-type: none"> <li>Verify test results.</li> </ul>		

If normal, return to diagnostic index to service any additional symptoms.

(See [SYMPTOM DIAGNOSTIC INDEX \[LF\]](#).)

- If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.
  - If vehicle is repaired, troubleshooting completed.
  - If vehicle is not repaired or additional diagnostic information is not available, replace the PCM.

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### NO.9 FAST IDLE/RUNS ON [LF]

9	FAST IDLE/RUNS ON
DESCRIPTION	<ul style="list-style-type: none"> <li>The engine speed continues at fast idle after warm-up.</li> <li>The engine runs after the ignition switch is turned off.</li> </ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>ECT sensor malfunction</li> <li>Air leakage from intake-air system</li> <li>Throttle body malfunction</li> <li>Accelerator pedal position sensor misadjustment</li> <li>Cruise control system operation improperly</li> <li>Improper load signal input</li> <li>Improper operation of electronic throttle control system</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect the M-MDS to the DLC-2.  Access ECT PID.  Start and warm up engine to normal operating temperature.  Is ECT PID between <b>82—112°C {180—234°F}</b> ?	Yes	Go to the next step.
		No	<b>ECT PID is higher than 112°C {234°F}:</b>  Go to symptom troubleshooting "No.17 Cooling system concerns - Overheating".  <b>ECT PID is less than 82°C {180°F}:</b>  Go to symptom troubleshooting "No.18 Cooling system concerns - Runs cold".
2	Connect the M-MDS to the DLC-2.  Turn the ignition switch to the ON position (Engine off).  Retrieve any DTCs.	Yes	<b>DTC is displayed:</b>  Go to the appropriate DTC inspection.  (See <a href="#">DTC TABLE [LF]</a> .)

	Are there any DTCs displayed?	No	<b>No DTC is displayed:</b> Go to the next step.
3	Access and monitor AC_REQ, CPP (MT), CPP/PNP (MT), and TR (AT) PIDs.  Are PIDs values normal?  (See <b>PCM INSPECTION [LF]</b> .)	Yes	Go to the next step.
		No	<b>If the AC_REQ PID is not normal:</b> <ul style="list-style-type: none"> <li>Inspect A/C switch, refrigerant pressure switch, and fan switch, and related wiring harness for vibration or intermittent open/short circuit.</li> </ul> <b>If the CPP PID is not normal:</b> <ul style="list-style-type: none"> <li>Inspect clutch position switch and related wiring harness for vibration or intermittent open/short circuit.</li> </ul> <b>If the CPP/PNP PID is not normal:</b> <ul style="list-style-type: none"> <li>Inspect neutral position switch and related wiring harness for vibration or intermittent open/short circuit.</li> </ul> <b>If the TR PID is not normal:</b> <ul style="list-style-type: none"> <li>Inspect TR switch and related wiring harness for vibration or intermittent open/short circuit.</li> </ul>
4	Connect the M-MDS to the DLC-2.  Start the engine and idle it.  Retrieve any DTCs for EHPAS.  Is there any EHPAS DTC displayed?	Yes	<b>DTC is displayed:</b> Go to appropriate DTC inspection.
		No	<b>No DTC is displayed:</b> Go to the next step.
5	Is there air leakage felt or heard at intake-air system components while racing engine to higher speed?	Yes	Repair or replace parts if necessary.
		No	Inspect the following: <ul style="list-style-type: none"> <li>Electronic throttle control system operation</li> <li>Accelerator pedal position sensor</li> </ul>
6	<ul style="list-style-type: none"> <li>Verify test results. <ul style="list-style-type: none"> <li>If normal, return to diagnostic index to service any additional symptoms.  (See <b>SYMPTOM DIAGNOSTIC INDEX [LF]</b>.)</li> <li>If malfunction remains, inspect related Service Bulletins and/or On-</li> </ul> </li> </ul>		



line Repair Information and perform repair or diagnosis.

- If vehicle is repaired, troubleshooting completed.
- If vehicle is not repaired or additional diagnostic information is not available, replace the PCM.

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NO.10 LOW IDLE/STALLS DURING DECELERATION [LF]

10	LOW IDLE/STALLS DURING DECELERATION		
DESCRIPTION	<ul style="list-style-type: none"><li>• Engine stops unexpectedly at the beginning of deceleration or recovery from deceleration.</li></ul>		
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Vacuum leakage</li><li>• Improper operation of electronic throttle control system</li><li>• Air leakage from intake-air system</li><li>• Improper air/fuel mixture ratio control</li><li>• Evaporative emission control system malfunction</li><li>• Accelerator pedal position sensor or related circuit malfunction</li><li>• Accelerator pedal position sensor misadjustment</li><li>• TP sensor or related circuit malfunction</li><li>• MAF sensor or related circuit malfunction</li><li>• Brake switch or related circuit malfunction</li><li>• Neutral/clutch pedal position switch or related circuit malfunction (MT)</li><li>• TR switch or related circuit malfunction (AT)</li><li>• Improper A/C magnetic clutch operation</li></ul>		

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Does the engine idle roughly?	Yes	Go to symptom troubleshooting "No.8 Engine runs rough/rolling idle".  (See <b>NO.8 ENGINE RUNS ROUGH/ROLLING IDLE [LF]</b> .)
		No	Go to the next step.

2	Turn off the A/C switch and fan switch.  Does the A/C magnetic clutch engage?	Yes	Go to symptom troubleshooting "No.24 A/C is always on or A/C compressor runs continuously."  (See <b>NO.24 A/C IS ALWAYS ON/A/C COMPRESSOR RUNS CONTINUOUSLY [LF]</b> .)
		No	Go to the next step.
3	Verify the following: <ul style="list-style-type: none"> <li>• Proper routing of and no damage to vacuum lines</li> <li>• No air leakage from intake-air system</li> </ul> Are all items normal?	Yes	Go to the next step.
		No	Service if necessary.  Repeat Step 3.
4	Connect the M-MDS to the DLC-2.  Turn the ignition switch to the ON position (Engine off).  Retrieve any DTCs.  Are there any DTCs displayed?	Yes	<b>DTC is displayed:</b>  Go to the appropriate DTC inspection.  (See <b>DTC TABLE [LF]</b> .)
		No	<b>No DTC is displayed:</b>  Go to the next step.
5	Perform the electronic throttle control system operation inspection.  (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b> .)  Does the electronic throttle control system function properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to electronic throttle control system operation inspection results.
6	Disconnect the vacuum hose between the purge solenoid valve and the intake manifold from purge solenoid valve side.  Plug opening end of vacuum hose.  Drive the vehicle.  Does the engine condition improve?	Yes	Inspect the evaporative emission control system.
		No	Go to the next step.
7	Connect the M-MDS to the DLC-2.  Access APP1, APP2, TP, MAF and VSS PIDs.  Monitor each PID while driving vehicle.  (See <b>PCM INSPECTION [LF]</b> .)	Yes	Go to the next step.
		No	<b>APP1, APP2 PIDs:</b> Inspect the accelerator pedal position sensor.  <b>TP PID:</b> Inspect TP sensor.

	Are PIDs normal?		<b>MAF PID:</b> Inspect MAF sensor. <b>VSS PID:</b> Inspect VSS.
8	Access and monitor BOO, CPP (MT), CPP/PNP (MT), and TR (AT) PIDs.  Are PIDs values normal?  (See <b>PCM INSPECTION [LF]</b> .)	Yes	Go to the next step.
		No	<p>If the BOO PID is not normal:</p> <ul style="list-style-type: none"><li>• Inspect brake switch, and related wiring harness for vibration or intermittent open/short circuit.</li></ul> <p>If the CPP PID is not normal:</p> <ul style="list-style-type: none"><li>• Inspect clutch position switch and related wiring harness for vibration or intermittent open/short circuit.</li></ul> <p>If the CPP/PNP PID is not normal:</p> <ul style="list-style-type: none"><li>• Inspect neutral position switch and related wiring harness for vibration or intermittent open/short circuit.</li></ul> <p>If the TR PID is not normal:</p> <ul style="list-style-type: none"><li>• Inspect TR switch and related wiring harness for vibration or intermittent open/short circuit.</li></ul>
9	<ul style="list-style-type: none"><li>• Verify test results.<ul style="list-style-type: none"><li>▪ If normal, return to diagnostic index to service any additional symptoms.  (See <b>SYMPTOM DIAGNOSTIC INDEX [LF]</b>.)</li><li>▪ If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.<ul style="list-style-type: none"><li>• If vehicle is repaired, troubleshooting completed.</li><li>• If vehicle is not repaired or additional diagnostic information is not available, replace the PCM.  (See <b>PCM INSPECTION [LF]</b>.)</li></ul></li></ul></li></ul>		



## 2008 - MX-5 - Engine

### NO.11 ENGINE STALLS/QUITS, ENGINE RUNS ROUGH, MISSES, BUCK/JERK, HESITATION/STUMBLE, SURGES [LF]

11	ENGINE STALLS/QUITS—ACCELERATION/CRUISE ENGINE RUNS ROUGH—ACCELERATION/CRUISE MISSES—ACCELERATION/CRUISE BUCK/JERK—ACCELERATION/CRUISE/DECELERATION HESITATION/STUMBLE—ACCELERATION SURGES—ACCELERATION/CRUISE
DESCRIPTION	<ul style="list-style-type: none"><li>• Engine stops unexpectedly at the beginning of acceleration or during acceleration.</li><li>• Engine stops unexpectedly while cruising.</li><li>• Engine speed fluctuates during acceleration or cruising.</li><li>• Engine misses during acceleration or cruising.</li><li>• Vehicle bucks/jerks during acceleration, cruising, or deceleration.</li><li>• Momentary pause at beginning of acceleration or during acceleration</li><li>• Momentary minor irregularity in engine output</li></ul>
	<ul style="list-style-type: none"><li>• Improper A/C system operation</li><li>• Erratic signal or no signal from CMP sensor</li><li>• Air leakage from intake-air system parts</li><li>• Purge solenoid valve malfunction</li><li>• Improper operation of electronic throttle control system</li><li>• EGR valve malfunction</li><li>• Erratic signal from CKP sensor</li><li>• Low engine compression</li><li>• Vacuum leakage</li><li>• Poor fuel quality</li></ul>

**POSSIBLE  
CAUSE**

- Main relay intermittent malfunction
- Throttle body malfunction
- Engine overheating
- Spark plug malfunction
- Improper air/fuel mixture ratio control operation
- Erratic signal to ignition coil
- Air cleaner restriction
- PCV valve malfunction
- Fuel flow into evaporative purge hose
- Improper valve timing due to jumping out timing belt
- Restriction in exhaust system
- Intermittent open or short circuit in fuel body pump circuit
- Inadequate fuel pressure
- Fuel pump mechanical malfunction
- Check valve (two-way) malfunction integrated with fuel tank
- Fuel leakage from fuel injector
- Fuel injector clogging
- Fuel line restriction or clogging
- Pressure regulator malfunction (built-in fuel pump unit)
- Erratic signal form Accelerator pedal position sensor
- Erratic signal form TP sensor
- Intermittent open or short circuit of MAF sensor, TP sensor, Accelerator pedal position sensor and VSS
- AT malfunction (AT)
- Clutch slippage (MT)
- Improper variable intake air control operation
- Loose attaching bolts or worn engine mounts

**WARNING:**

The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:

- Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.
- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and

"AFTER SERVICE PRECAUTION" described in this manual.

(See **BEFORE SERVICE PRECAUTION [LF]**.)

(See **AFTER SERVICE PRECAUTION [LF]**.)

**CAUTION:**

- Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.

**Diagnostic procedure**

STEP	INSPECTION	RESULTS	ACTION
1	Verify the following: <ul style="list-style-type: none"><li>• Vacuum connection</li><li>• Air cleaner element</li><li>• No air leakage from intake-air system</li><li>• No restriction of intake-air system</li><li>• Proper sealing of intake manifold and components attached to intake manifold: such as EGR valve</li><li>• Ignition wiring</li><li>• Fuel quality (such as proper octane, contamination, winter/summer blend)</li><li>• Electrical connections</li><li>• Smooth operation of throttle valve</li></ul> Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 1.
2	Connect the M-MDS to the DLC-2.  Turn the ignition switch to the ON position (Engine off).  Retrieve any DTCs.  Are there any DTCs displayed?	Yes	<b>DTC is displayed:</b>  Go to the appropriate DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	<b>No DTC is displayed:</b>  Go to the next step.
3	Is engine overheating?	Yes	Go to symptom troubleshooting "No.17 Cooling system concerns - Overheating".



		No	Go to the next step.
4	<p>Connect the M-MDS to the DLC-2.</p> <p>Access APP1, APP2, RPM, VPWR, MAF, TP and VSS PIDs.</p> <p>Drive the vehicle with monitoring PIDs.</p> <p>Are PIDs within specifications?</p> <p>(See <b>PCM INSPECTION [LF]</b>.)</p>	Yes	Go to the next step.
		No	<p><b>APP1, APP2 PIDs:</b></p> <p>Inspect if output signal from accelerator pedal position sensor changes smoothly.</p> <p><b>RPM PID:</b></p> <p>Inspect the CKP sensor and related wiring harness for vibration or intermittent open/short circuit.</p> <p><b>VPWR PID:</b></p> <p>Inspect for open circuit intermittently.</p> <p><b>MAF PID:</b></p> <p>Inspect for open circuit of the MAF sensor and related wiring harness intermittently.</p> <p><b>TP PID:</b></p> <p>Inspect if output signal from TP sensor changes smoothly.</p> <p><b>VSS PID:</b></p> <p>Inspect for open circuit of VSS and related wiring harness intermittently.</p>
5	<p>Visually inspect the CKP sensor and teeth of crankshaft pulley.</p> <p>Are CKP sensor and teeth of crankshaft pulley normal?</p>	Yes	Go to the next step.
		No	Replace the malfunctioning part.
6	<p>Inspect the spark plug conditions.</p> <p>Is spark plug wet, covered with carbon or grayish white?</p>	Yes	<p><b>Spark plug is wet or covered with carbon:</b></p> <p>Inspect for fuel leakage from fuel injector.</p> <p><b>Spark plug is grayish white:</b></p> <p>Inspect the fuel injector for clogging.</p>
		No	<p>Install the spark plugs on original cylinders.</p> <p>Go to the next step.</p>

7	Remove and shake the PCV valve.  Does the PCV valve rattle?	Yes	Go to the next step.
		No	Replace the PCV valve.
8	Perform the electronic throttle control system operation inspection.  (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF].</b> )  Does the electronic throttle control system function properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to electronic throttle system operation inspection results.
9	Visually inspect deformed exhaust system part.  Is there any deformed exhaust system part?	Yes	Replace the suspected part.
		No	Go to the next step.
10	Install fuel pressure gauge between the fuel pipe and fuel distributor.  Short check connector terminal F/P to body GND using a jumper wiring.  Turn the ignition switch to the ON position.  Is fuel line pressure correct with ignition switch to ON position?  (See <b>FUEL LINE PRESSURE INSPECTION [LF].</b> )	Yes	Go to the next step.
		No	<b>Zero or low:</b>  Inspect the fuel pump relay and fuel pump circuit.  Inspect the fuel line for clogging.  If there is no malfunction, replace the fuel pump unit.  (See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF].</b> )  <b>High:</b>  Replace the fuel pump unit.  (See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF].</b> )
11	Visually inspect for fuel leakage at fuel injector O-ring and fuel line.  Service if necessary.  Is fuel line pressure held after ignition switch is turned off?  (See <b>FUEL LINE PRESSURE INSPECTION [LF].</b> )	Yes	Go to the next step.
		No	Inspect the fuel injector.  If the fuel injector is normal, replace the fuel pump unit.  (See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF].</b> )
12	<b>NOTE:</b>  • The following test is for engine stall with the A/C on. If other symptom	Yes	Go to the next step.
		No	If the A/C is always on, go to symptom troubleshooting "No.24 A/C is always

	<p>exists, go to the next step.</p> <p>Connect a pressure gauge to A/C low and high pressure side lines.</p> <p>Turn the A/C on and measure low side and high side pressure.</p> <p>Are pressures within specifications?</p> <p>(See <b>REFRIGERANT PRESSURE CHECK</b>.)</p>		<p>on or A/C compressor runs continuously".</p> <p>(See <b>NO.24 A/C IS ALWAYS ON/A/C COMPRESSOR RUNS CONTINUOUSLY [LF]</b>.)</p> <p>For other symptoms, inspect the following:</p> <ul style="list-style-type: none"> <li>• Refrigerant charging amount</li> <li>• Condenser fan operation</li> </ul>
13	<p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• The following test should be performed for symptom with cruise control ON. If other symptoms exist, go to the next step.</li> </ul> <p>Inspect cruise control system.</p> <p>Is cruise control system normal?</p>	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part.
14	<p>Inspect the front HO2S.</p> <p>(See <b>FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF]</b>.)</p> <p>Is the front HO2S normal?</p>	Yes	Go to the next step.
		No	<p>Replace the front HO2S.</p> <p>(See <b>FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]</b>.)</p>
15	<p>Inspect the evaporative purge hose between the fuel tank and the purge valve.</p> <p>Does fuel flow into evaporative purge hose?</p>	Yes	<p>Inspect the check valve (two-way).</p> <p>(See <b>FUEL TANK INSPECTION [LF]</b>.)</p>
		No	Go to the next step.
16	<p>Disconnect the vacuum hose between the purge solenoid valve and the intake manifold from the purge solenoid valve side.</p> <p>Plug opening end of vacuum hose.</p> <p>Drive the vehicle.</p> <p>Does the engine condition improve?</p>	Yes	<p>Go to the next step.</p> <p>Inspect if the purge solenoid valve is stuck open mechanically.</p> <p>Inspect the evaporative emission control system.</p>
		No	Go to the next step.
17	<p>Visually inspect the CMP sensor and projections of camshaft pulley.</p> <p>Are CMP sensor and projections of camshaft pulley</p>	Yes	Go to the next step.
		No	Replace the malfunctioning part.

	normal?		
18	Inspect the EGR system.  (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b> .)  Is the EGR system normal?	Yes	Go to the next step.
		No	Replace the malfunctioning part.
19	Is the engine compression correct?	Yes	Inspect the following: <ul style="list-style-type: none"> <li>• Valve timing</li> <li>• Internal transaxle part (AT)</li> <li>• Clutch (MT)</li> <li>• EGR valve (mechanical stuck)</li> <li>• Engine mounts</li> <li>• Check valve (two-way)</li> </ul>
		No	Inspect for cause.
20	<ul style="list-style-type: none"> <li>• Verify test results.               <ul style="list-style-type: none"> <li>▪ If normal, return to diagnostic index to service any additional symptoms.  (See <b>SYMPTOM DIAGNOSTIC INDEX [LF]</b>.)</li> <li>▪ If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.                   <ul style="list-style-type: none"> <li>• If vehicle is repaired, troubleshooting completed.</li> <li>• If vehicle is not repaired or additional diagnostic information is not available, replace the PCM.  (See <b>PCM REMOVAL/INSTALLATION [LF]</b>.)</li> </ul> </li> </ul> </li> </ul>		

## 2008 - MX-5 - Engine

### NO.14 POOR FUEL ECONOMY [LF]

14	POOR FUEL ECONOMY
<b>DESCRIPTION</b>	Fuel economy is unsatisfactory.
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"><li>• Contaminated air cleaner element</li><li>• Variable intake air control malfunction</li><li>• Engine cooling system malfunction</li><li>• Improper ATF level (AT)</li><li>• Weak spark</li><li>• Poor fuel quality</li><li>• Erratic or no signal from CMP sensor</li><li>• Clutch slippage (MT)</li><li>• Improper variable valve timing control system operation</li><li>• Improper coolant level</li><li>• Inadequate fuel pressure</li><li>• Spark plug malfunction</li><li>• PCV valve malfunction</li><li>• Brake dragging</li><li>• Improper valve timing due to jumping out of timing belt</li><li>• Contaminated MAF sensor</li><li>• Improper engine compression</li><li>• Exhaust system clogging</li></ul> <p><b>WARNING:</b></p> <p>The following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before servicing fuel system:</p> <ul style="list-style-type: none"><li>• Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.</li></ul>

- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.

(See **BEFORE SERVICE PRECAUTION [LF]**.)

(See **AFTER SERVICE PRECAUTION [LF]**.)

**CAUTION:**

- Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.

**Diagnostic procedure**

STEP	INSPECTION	RESULTS	ACTION
1	Inspect for the following: <ul style="list-style-type: none"> <li>Air cleaner element for contamination</li> <li>ATF level (AT)</li> <li>Fuel quality</li> <li>Coolant level</li> <li>Brake dragging</li> <li>Clutch slippage (MT)</li> </ul> Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 1.
2	Connect the M-MDS to the DLC-2.  Turn the ignition switch to the ON position (Engine off).  Retrieve any DTCs.  Are there any DTCs displayed?	Yes	<b>DTC is displayed:</b>  Go to the appropriate DTC inspection.  (See <b>DTC TABLE [LF]</b> .)
		No	<b>No DTC is displayed:</b>  Go to the next step.
3	Access ECT PID.  Drive vehicle while monitoring PID.  (See <b>PCM INSPECTION [LF]</b> .)  Is PID within specification?	Yes	Go to the next step.
		No	Inspect for coolant leakage, cooling fan and condenser fan operations or thermostat operation.
4	Perform the spark test.	Yes	Go to the next step.

	<p>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF].</b>)</p> <p>Is strong blue spark visible at each cylinder?</p>	No	Repair or replace the malfunctioning part according to spark test result.
5	<p>Install the fuel pressure gauge between the fuel pipe and the fuel distributor.</p> <p>Start the engine and idle it.</p> <p>Measure fuel line pressure during idle.</p> <p>Is fuel line pressure correct during idle?</p> <p>(See <b>FUEL LINE PRESSURE INSPECTION [LF].</b>)</p>	Yes	Go to the next step.
		No	<p><b>Low:</b></p> <p>Inspect the fuel pump relay and fuel pump circuit.</p> <p>Inspect the fuel line for clogging.</p> <p>If there is no malfunction, replace the fuel pump unit</p> <p>(See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF].</b>)</p> <p><b>High:</b></p> <p>Replace the fuel pump unit.</p> <p>(See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF].</b>)</p>
6	<p>Inspect for variable valve timing control system operation.</p> <p>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF].</b>)</p> <p>Does the variable valve timing control system function properly?</p>	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part.
7	<p>Inspect for the variable intake air control operation.</p> <p>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF].</b>)</p> <p>Does variable intake air control function properly?</p>	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part.
8	<p>Remove and shake the PCV valve.</p> <p>Does the PCV valve rattle?</p>	Yes	Go to the next step.
		No	Replace the PCV valve.
9	<p>Visually inspect the exhaust system part.</p> <p>Is there any deformed exhaust system?</p>	Yes	Replace the suspected part.
		No	Go to the next step.
10	Inspect for contaminated MAF sensor.	Yes	Go to the next step.

	Is there any contamination?	No	Inspect for cause.
11	Inspect the MAF sensor for contamination.	Yes	Replace MAF sensor.
	Is there any contamination?	No	Go to the next step.
12	Is engine compression correct?	Yes	Inspect the valve timing.
		No	Inspect for cause.
13	<ul style="list-style-type: none"> <li>• Verify test results. <ul style="list-style-type: none"> <li>▪ If normal, return to diagnostic index to service any additional symptoms. (See <a href="#">SYMPTOM DIAGNOSTIC INDEX [LF]</a>.)</li> <li>▪ If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. <ul style="list-style-type: none"> <li>• If vehicle is repaired, troubleshooting completed.</li> <li>• If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a>.)</li> </ul> </li> </ul> </li> </ul>		

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NO.15 EMISSION COMPLIANCE [LF]

15	EMISSION COMPLIANCE
DESCRIPTION	Fails emissions test.
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Vacuum lines leakage or blockage</li><li>• Cooling system malfunction</li><li>• Spark plug malfunction</li><li>• Leakage from intake manifold</li><li>• Erratic or no signal from CMP sensor</li><li>• Inadequate fuel pressure</li><li>• PCV valve malfunction or incorrect valve installation</li><li>• EGR valve malfunction</li><li>• Exhaust system clogging</li><li>• Fuel tank ventilation system malfunction</li><li>• Fuel-filler cap malfunction</li><li>• Charcoal canister damage</li><li>• Air cleaner element clogging or restriction</li><li>• Throttle body malfunction</li><li>• Erratic signal to ignition coil</li><li>• Improper air/fuel mixture ratio control operation</li><li>• Bend or open circuit HO2S wiring harness</li><li>• Catalyst converter malfunction</li><li>• Engine internal parts malfunction</li><li>• Excessive carbon is built up in combustion chamber</li><li>• Improper engine compression</li><li>• Improper valve timing</li></ul>

**WARNING:**

The following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before servicing fuel system:

- Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.
- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.

(See **BEFORE SERVICE PRECAUTION [LF]**.)

(See **AFTER SERVICE PRECAUTION [LF]**.)

**CAUTION:**

- Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.

**Diagnostic procedure**

STEP	INSPECTION	RESULTS	ACTION
1	Inspect for the following: <ul style="list-style-type: none"><li>• Vacuum lines for leakage or blockage</li><li>• Electrical connections</li><li>• Proper maintenance schedule followed</li><li>• Intake air system and air cleaner element concerns: obstructions, leakage or dirtiness</li></ul> Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 1.
2	Connect the M-MDS to the DLC-2.  Turn the ignition switch to the ON position (Engine off).  Retrieve any DTCs.  Are there any DTCs displayed?	Yes	<b>DTC is displayed:</b>  Go to appropriate DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	<b>No DTC is displayed:</b>  Go to the next step.
3	Is any other driveability concern present?	Yes	Go to appropriate symptom troubleshooting.

		No	Go to the next step.
4	Connect the M-MDS to the DLC-2.  Access ECT PID.  Warm up the engine and idle it.  Verify ECT PID is correct.  (See <b>PCM INSPECTION [LF]</b> .)  Is ECT PID correct?	Yes	Go to the next step.
		No	Inspect for coolant leakage, cooling fan and condenser fan operation or thermostat operation.
5	Inspect fuel-filler cap.  (See <b>FUEL-FILLER CAP INSPECTION [LF]</b> .)  Is there any leakage at fuel-filler cap?	Yes	Replace the fuel-filler cap.
		No	Go to the next step.
6	Inspect the front HO2S.  (See <b>FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF]</b> .)  Is front HO2S normal?	Yes	Go to the next step.
		No	Replace the front HO2S.  (See <b>FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]</b> .)
7	Perform spark test.  (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b> .)  Is strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to spark test result.
8	Install the fuel pressure gauge between the fuel pipe and the fuel distributor.  Start the engine and idle it.  Measure fuel line pressure during idle.  Is fuel line pressure correct during idle?  (See <b>FUEL LINE PRESSURE INSPECTION [LF]</b> .)	Yes	Go to the next step.
		No	<b>Low:</b>  Inspect the fuel line for clogging.  If there is no malfunction, replace the fuel pump unit.  (See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF]</b> .)  <b>High:</b>  Replace the fuel pump unit.  (See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF]</b> .)
9	Remove and shake the PCV valve.	Yes	Go to the next step.

	Does the PCV valve rattle?	No	Replace the PCV valve.
10	Inspect for fuel saturation inside charcoal canister. Is excess amount of liquid fuel present in canister?	Yes	Replace the charcoal canister.
		No	Inspect the fuel tank vent system. Then, go to the next step. (See <a href="#">FUEL TANK INSPECTION [LF]</a> .)
11	visually inspect the exhaust system part. Is there any deformed exhaust system part?	Yes	Replace the part.
		No	Go to the next step.
12	Inspect the three-way catalytic converter. (See <a href="#">EXHAUST SYSTEM INSPECTION [LF]</a> .) Is the three-way catalytic converter normal?	Yes	Inspect the EGR system.  (See <a href="#">ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</a> .)
		No	Replace the three-way catalytic converter.
13	<ul style="list-style-type: none"> <li>• Verify test results. <ul style="list-style-type: none"> <li>▪ If normal, return to diagnostic index to service any additional symptoms. (See <a href="#">SYMPTOM DIAGNOSTIC INDEX [LF]</a>.)</li> <li>▪ If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. <ul style="list-style-type: none"> <li>• If vehicle is repaired, troubleshooting completed.</li> <li>• If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a>.)</li> </ul> </li> </ul> </li> </ul>		

## 2008 - MX-5 - Engine

### NO.16 HIGH OIL CONSUMPTION/LEAKAGE [LF]

16	HIGH OIL CONSUMPTION/LEAKAGE
<b>DESCRIPTION</b>	Oil consumption is excessive.
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• PCV valve malfunction</li> <li>• Improper dipstick</li> <li>• Improper engine oil viscosity</li> <li>• Engine internal parts malfunction</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Remove and shake the PCV valve.	Yes	Go to the next step.
	Does the PCV valve rattle?	No	Replace the PCV valve.
2	Inspect for the following: <ul style="list-style-type: none"> <li>• External leakage</li> <li>• Proper dipstick</li> <li>• Proper engine oil viscosity</li> </ul>	Yes	Inspect the internal engine parts such as valves, valve guides, valve stem seals, cylinder head drain passage, and piston rings.
	Are all items normal?	No	Service if necessary. Repeat Step 2.
3	<ul style="list-style-type: none"> <li>• Verify test results. <ul style="list-style-type: none"> <li>▪ If normal, return to diagnostic index to service any additional symptoms.</li> </ul> </li> </ul>		

(See [SYMPTOM DIAGNOSTIC INDEX \[LF\]](#).)

- If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.
  - If vehicle is repaired, troubleshooting completed.
  - If vehicle is not repaired or additional diagnostic information is not available, replace the PCM.

(See [PCM REMOVAL/INSTALLATION \[LF\]](#).)

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### NO.17 COOLING SYSTEM CONCERNS-OVERHEATING [LF]

17	COOLING SYSTEM CONCERNS-OVERHEATING
<b>DESCRIPTION</b>	Engine runs at higher than normal temperature/overheats.
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Improper coolant level</li> <li>• Blown fuses</li> <li>• Coolant leakage</li> <li>• Excessive A/C system pressure</li> <li>• A/C system operation is improper</li> <li>• Improper water/anti freeze mixture</li> <li>• Fans reverse rotation</li> <li>• Poor radiator condition</li> <li>• Thermostat malfunction</li> <li>• Radiator hoses damage</li> <li>• Improper or damaged radiator cap</li> <li>• Cooling fan is inoperative.</li> <li>• Coolant overflow system malfunction</li> <li>• Improper tension of drive belt</li> <li>• Drive belt damage</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect the following: <ul style="list-style-type: none"> <li>• Engine coolant level</li> <li>• Coolant</li> </ul>	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 1.

	<p>leakage</p> <ul style="list-style-type: none"><li>• Water and anti freeze mixture</li><li>• Radiator condition</li><li>• Collapsed or restricted radiator hoses</li><li>• Radiator pressure cap</li><li>• Overflow system</li><li>• Fan rotational direction</li><li>• Fuses</li></ul> <p>Are all items normal?</p>		
2	<p>Connect the M-MDS to the DLC-2.</p> <p>Turn the ignition switch to the ON position (Engine off).</p> <p>Retrieve any DTCs.</p> <p>Are there any DTCs displayed?</p>	Yes	<p><b>DTC is displayed:</b></p> <p>Go to the appropriate DTC inspection.</p> <p>(See <a href="#">DTC TABLE [LF]</a>.)</p>
		No	<p><b>No DTC is displayed:</b></p> <p>Go to the next step.</p>
3	<p>Start the engine and idle it.</p> <p>Turn the A/C switch on and set blower fan to any speed.</p> <p>Does the A/C compressor engage?</p>	Yes	<p>Go to Step 5.</p>
		No	<p>Inspect for the following and repair or replace if necessary:</p> <ul style="list-style-type: none"><li>• Refrigerant charging amount</li><li>• Open circuit in wiring harness between A/C relay and PCM terminal 1I</li><li>• Seized A/C magnetic clutch</li><li>• A/C magnetic clutch malfunction</li></ul> <p>If all items are normal, go to the next step.</p>
4	<p>Connect the M-MDS to DLC-2.</p> <p>Access AC_REQ PID.</p> <p>Start the engine and idle it.</p> <p>Turn the A/C switch and fan</p>	Yes	<p>Go to the next step.</p>
		No	<p>Inspect the following:</p> <ul style="list-style-type: none"><li>• Refrigerant pressure switch operation</li></ul>



	switch on.  Does AC_REQ PID read on?		<p>The A/C switch is stuck open.</p> <ul style="list-style-type: none"> <li>• Open or short circuit between refrigerant pressure switch and PCM terminal 1AU</li> <li>• Open circuit of blower motor fan switch and resistor (if blower motor does not operate)</li> <li>• The evaporator temperature sensor and A/C amplifier</li> </ul>
5	Inspect cooling fan control system operation.  (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF].</b> )  Does the cooling fan control system function properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part.
6	Is the drive belt normal?	Yes	Go to the next step.
		No	Replace the drive belt.
7	Is there leakage around the heater unit in passenger compartment?	Yes	Inspect and service heater for leakage.
		No	Go to the next step.
8	Is there leakage at the coolant hoses and/or radiator?	Yes	Replace the malfunctioning part.
		No	Go to the next step.
9	Cool down the engine.  Remove thermostat and inspect operation.  (See <b>THERMOSTAT REMOVAL/INSTALLATION [LF].</b> )  (See <b>THERMOSTAT INSPECTION [LF].</b> )  Is thermostat normal?	Yes	The engine coolant temperature and thermostat are normal, inspect engine block for leakage or blockage.
		No	Access ECT PID.  Inspect for both ECT PID and temperature gauge readings.  If temperature gauge on instrument cluster indicates normal range but ECT PID is not same as temperature gauge reading, inspect ECT sensor.  If temperature gauge on instrument cluster indicates overheating but ECT PID is normal, inspect temperature gauge and heat gauge unit.
10	<ul style="list-style-type: none"> <li>• Verify test results.               <ul style="list-style-type: none"> <li>▪ If normal, return to diagnostic index to service any additional symptoms.</li> </ul> </li> </ul> (See <b>SYMPTOM DIAGNOSTIC INDEX [LF].</b> )		

- If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.
  - If vehicle is repaired, troubleshooting completed.
  - If vehicle is not repaired or additional diagnostic information is not available, replace the PCM.

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### NO.18 COOLING SYSTEM CONCERNS-RUNS COLD [LF]

18	COOLING SYSTEM CONCERNS-RUNS COLD
<b>DESCRIPTION</b>	Engine takes excessive time to reach normal operating temperature.
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Thermostat malfunction</li> <li>• Cooling fan system malfunction</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Is customer complaint "Lack of passenger compartment heat" only?	Yes	Inspect A/C and heater system.
		No	Go to the next step.
2	Does the engine speed continue at fast idle?	Yes	Go to symptom troubleshooting "No.9 Fast idle/runs on". (See <a href="#">NO.9 FAST IDLE/RUNS ON [LF]</a> .)
		No	Go to the next step.
3	Remove the thermostat and inspect operation.  (See <a href="#">THERMOSTAT REMOVAL/INSTALLATION [LF]</a> .)  (See <a href="#">THERMOSTAT INSPECTION [LF]</a> .)  Is thermostat normal?	Yes	Go to the next step.
		No	Replace the thermostat.
4	Inspect cooling fan control system operation.  (See <a href="#">ENGINE CONTROL SYSTEM OPERATION</a>	Yes	Access ECT PID.  Inspect for both ECT PID and temperature gauge on instrument cluster readings.

	<b>INSPECTION [LF].)</b>  Does the cooling fan control system function properly?		If the temperature gauge on the instrument cluster indicates normal range but ECT PID is not the same as temperature gauge reading, inspect the ECT sensor.  If the temperature gauge on the instrument cluster indicates cold range but ECT PID is normal, inspect the temperature gauge and heat gauge unit.
		No	Repair or replace the malfunctioning part.
5	<ul style="list-style-type: none"><li>• Verify test results.<ul style="list-style-type: none"><li>▪ If normal, return to diagnostic index to service any additional symptoms. (See <b>SYMPTOM DIAGNOSTIC INDEX [LF].)</b></li><li>▪ If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.<ul style="list-style-type: none"><li>• If vehicle is repaired, troubleshooting completed.</li><li>• If vehicle is not repaired or additional diagnostic information is not available, replace PCM. (See <b>PCM REMOVAL/INSTALLATION [LF].)</b></li></ul></li></ul></li></ul>		

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### NO.20 FUEL ODOR (IN ENGINE COMPARTMENT) [LF]

20	FUEL ODOR (IN ENGINE COMPARTMENT)
<b>DESCRIPTION</b>	Gasoline fuel smell or visible leakage
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Excessive fuel pressure</li> <li>Purge solenoid valve malfunction</li> <li>Fuel tank vent system blockage</li> <li>Charcoal canister malfunction</li> <li>Fuel leakage from fuel system</li> </ul> <p><b>WARNING:</b></p> <p>The following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before servicing fuel system:</p> <ul style="list-style-type: none"> <li>Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.</li> <li>Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.</li> </ul> <p>(See <b>BEFORE SERVICE PRECAUTION [LF]</b>.)</p> <p>(See <b>AFTER SERVICE PRECAUTION [LF]</b>.)</p> <p><b>CAUTION:</b></p> <ul style="list-style-type: none"> <li>Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Visually inspect for fuel leakage at fuel injector O-ring and	Yes	Go to the next step.

	<p>fuel line.</p> <p>Service if necessary.</p> <p>Install the fuel pressure gauge between the fuel pipe and the fuel distributor.</p> <p>Start engine and idle it.</p> <p>Measure fuel line pressure during idle.</p> <p>Is fuel line pressure correct during idle?</p> <p>(See <b>FUEL LINE PRESSURE INSPECTION [LF].</b>)</p>	No	<p>Replace the fuel pump unit.</p> <p>(See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF].</b>)</p>
2	<p>Inspect for blockage/restriction or open circuit in wiring harness between the engine vacuum port and the charcoal canister.</p> <p>Inspect for blockage in fuel tank vent system.</p> <p>Is malfunction indicated?</p>	Yes	Replace vacuum hose.
		No	Go to the next step.
3	<p>Inspect the purge solenoid valve.</p> <p>(See <b>PURGE SOLENOID VALVE INSPECTION [LF].</b>)</p> <p>Is the solenoid operating properly?</p>	Yes	Go to the next step.
		No	<p>Replace the purge solenoid valve.</p> <p>(See <b>PURGE SOLENOID VALVE REMOVAL/INSTALLATION [LF].</b>)</p>
4	<p>Connect the M-MDS to the DLC-2.</p> <p>Turn the ignition switch to the ON position (Engine off).</p> <p>Retrieve any DTCs.</p> <p>Are there any DTCs displayed?</p>	Yes	<p><b>DTC is displayed:</b></p> <p>Go to the appropriate DTC inspection.</p> <p>(See <b>DTC TABLE [LF].</b>)</p>
		No	<p><b>No DTC is displayed:</b></p> <p>Inspect charcoal canister for fuel saturation.</p> <p>If excess amount of liquid fuel is present, replace the charcoal canister.</p>
5	<ul style="list-style-type: none"><li>• Verify test results.<ul style="list-style-type: none"><li>▪ If normal, return to diagnostic index to service any additional symptoms.</li></ul>(See <b>SYMPTOM DIAGNOSTIC INDEX [LF].</b>)</li><li>▪ If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.</li></ul>		

If vehicle is repaired, troubleshooting completed.

- If vehicle is not repaired or additional diagnostic information is not available, replace the PCM.

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NO.21 ENGINE NOISE [LF]

21	ENGINE NOISE
DESCRIPTION	Engine noise from under hood
POSSIBLE CAUSE	<p><b>Squeal, click or chirp noise:</b></p> <ul style="list-style-type: none"><li>• Improper engine oil level</li><li>• Improper drive belt tension</li><li>• Generator installation (alignment)</li><li>• Splash shield or under cover looseness (splashed water to drive belts)</li></ul> <p><b>Rattle sound noise:</b></p> <ul style="list-style-type: none"><li>• Loose parts</li></ul> <p><b>Hiss sound noise:</b></p> <ul style="list-style-type: none"><li>• Vacuum leakage</li><li>• Loose spark plug</li><li>• Air leakage from intake air system</li></ul> <p><b>Rumble or grind noise:</b></p> <ul style="list-style-type: none"><li>• Improper drive belt tension</li><li>• Improper P/S fluid level</li></ul> <p><b>Rap or roar noise:</b></p> <ul style="list-style-type: none"><li>• Dynamic dumper looseness</li><li>• Exhaust system looseness</li><li>• Intake-air system looseness</li></ul> <p><b>Other noise:</b></p> <ul style="list-style-type: none"><li>• Camshaft friction gear noise or MLA noise</li><li>• Timing chain noise</li></ul>

Diagnostic procedure



STEP	INSPECTION	RESULTS	ACTION
1	Is a squealing, click or chirping sound present?	Yes	Inspect for the followings: <ul style="list-style-type: none"> <li>• Engine oil level</li> <li>• Drive belt tension</li> <li>• Splash shield or under cover looseness</li> <li>• Generator installation (alignment)</li> </ul>
		No	Go to the next step.
2	Is a rumbling or grinding noise present?	Yes	Inspect for the followings: <ul style="list-style-type: none"> <li>• Drive belt tension</li> <li>• P/S fluid level</li> </ul>
		No	Go to the next step.
3	Is a rattling noise present?	Yes	Inspect rattling location for loose parts.
		No	Go to the next step.
4	Is a hissing noise present?	Yes	Inspect for the following: <ul style="list-style-type: none"> <li>• Vacuum leakage</li> <li>• Spark plug looseness</li> <li>• Intake air system leakage</li> </ul>
		No	Go to the next step.
5	Is a rapping or roar noise present?	Yes	Inspect looseness for followings: <ul style="list-style-type: none"> <li>• Dynamic dumper</li> <li>• Intake-air system</li> <li>• Exhaust system</li> </ul>
		No	Go to the next step.
6	Is a knocking noise present?	Yes	Go to symptom troubleshooting "No.11 Knocking/pinging". (See <b>NO.13 KNOCKING/PINGING-ACCELERATION/CRUISE [LF].</b> )

		No	If the noise comes from the engine internal, inspect for friction gear, timing chain or MLA noise.
7	<ul style="list-style-type: none"><li>• Verify test results.<ul style="list-style-type: none"><li>▪ If normal, return to diagnostic index to service any additional symptoms. (See <a href="#">SYMPTOM DIAGNOSTIC INDEX [LF]</a>.)</li><li>▪ If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.<ul style="list-style-type: none"><li>• If vehicle is repaired, troubleshooting completed.</li><li>• If vehicle is not repaired or additional diagnostic information is not available, replace the PCM. (See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a>.)</li></ul></li></ul></li></ul>		

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### NO.22 VIBRATION CONCERNS (ENGINE) [LF]

22	VIBRATION CONCERNS (ENGINE)
<b>DESCRIPTION</b>	<ul style="list-style-type: none"> <li>• Vibration from under hood or driveline</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Loose attaching bolts or worn parts</li> <li>• Components malfunction such as worn parts</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect the following components for loose attaching bolts or worn parts: <ul style="list-style-type: none"> <li>• Cooling fan</li> <li>• Drive belt and pulleys</li> <li>• Generator</li> <li>• Engine mounts</li> <li>• Exhaust system mounts</li> </ul> All items normal?	Yes	Inspect the following systems: <ul style="list-style-type: none"> <li>• Wheels</li> <li>• AT</li> <li>• Driveline</li> <li>• Suspension</li> </ul>
		No	Readjust or retighten engine mount installation position.  Service if necessary for other parts.
2	<ul style="list-style-type: none"> <li>• Verify test results.               <ul style="list-style-type: none"> <li>▪ If normal, return to diagnostic index to service any additional symptoms. (See <a href="#">SYMPTOM DIAGNOSTIC INDEX [LF]</a>.)</li> <li>▪ If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.                   <ul style="list-style-type: none"> <li>• If vehicle is repaired, troubleshooting completed.</li> <li>• If vehicle is not repaired or additional diagnostic information is not available, replace the PCM.</li> </ul> </li> </ul> </li> </ul>		

(See [PCM REMOVAL/INSTALLATION \[LF\]](#).)

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### NO.23 A/C DOES NOT WORK SUFFICIENTLY [LF]

23	A/C DOES NOT WORK SUFFICIENTLY.
<b>DESCRIPTION</b>	A/C compressor magnetic clutch does not engage when the A/C switch is turned on.
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Improper refrigerant charging amount</li> <li>• Open the A/C magnetic clutch</li> <li>• Open circuit in wiring harness between A/C relay and A/C magnetic clutch</li> <li>• Poor GND of A/C magnetic clutch</li> <li>• Refrigerant pressure switch is stuck open.</li> <li>• A/C relay is stuck open.</li> <li>• Seized A/C compressor</li> <li>• Open circuit in wiring harness between A/C switch and PCM through both refrigerant pressure switch and A/C amplifier</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect the M-MDS to the DLC-2.  Turn the ignition switch to the ON position (Engine off).  Retrieve any DTCs.	Yes	<b>DTC is displayed:</b> Go to the appropriate DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .)
	Are there any DTCs displayed?	No	<b>No DTC is displayed:</b> Go to the next step.
2	Disconnect A/C compressor connector.  Start engine and turn A/C switch on.	Yes	Inspect for GND condition of magnetic clutch on A/C compressor.  If GND condition is normal, inspect for open circuit magnetic clutch coil.
	Is there correct voltage at A/C		

	compressor magnetic clutch terminal?	No	Go to the next step.
	<p><b>Specification</b></p> <ul style="list-style-type: none"> <li>• <b>10.5 V or more</b></li> </ul>		
3	<p>Disconnect refrigerant pressure switch connector.</p> <p>Connect jumper wiring between A/C high pressure switch terminal.</p> <p>Connect jumper wiring between refrigerant pressure switch terminal.</p> <p>Turn the ignition switch to the ON position.</p> <p>Turn A/C switch on and set blower fan to any speed.</p> <p>Does A/C work?</p>	Yes	<p>Inspect refrigerant pressure switch operation.</p> <p>If switch is normal, go to the next step.</p>
		No	<p>Inspect for the following:</p> <ul style="list-style-type: none"> <li>• A/C switch is stuck open.</li> <li>• Open circuit in wiring harness between refrigerant pressure switch and PCM terminal 1AU</li> <li>• Open circuit in wiring harness between blower motor fan switch and resistor (if blower motor does not operate)</li> <li>• Evaporator temperature sensor and A/C amplifier</li> </ul>
4	<p>Remove jumper wiring from the switch connector.</p> <p>Reconnect connector to refrigerant pressure switch.</p> <p>Start the engine and turn the A/C switch on.</p> <p>Does the fan operate?</p>	Yes	<p>Inspect whether A/C relay is stuck open.</p> <p>Replace if necessary.</p>
		No	<p>Inspect the following and repair or replace if necessary:</p> <ul style="list-style-type: none"> <li>• Refrigerant charging amount</li> <li>• A/C compressor for seizure</li> </ul>
5	<ul style="list-style-type: none"> <li>• Verify test results. <ul style="list-style-type: none"> <li>▪ If normal, return to diagnostic index to service any additional symptoms.</li> </ul> <p>(See <b>SYMPTOM DIAGNOSTIC INDEX [LF]</b>.)</p> <li>▪ If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. <ul style="list-style-type: none"> <li>• If vehicle is repaired, troubleshooting completed.</li> <li>• If vehicle is not repaired or additional diagnostic information is not available, replace the PCM.</li> </ul> </li> </li></ul> <p>(See <b>PCM REMOVAL/INSTALLATION [LF]</b>.)</p>		



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NO.24 A/C IS ALWAYS ON/A/C COMPRESSOR RUNS CONTINUOUSLY [LF]

24	A/C IS ALWAYS ON OR A/C COMPRESSOR RUNS CONTINUOUSLY.
DESCRIPTION	A/C compressor magnetic clutch does not disengage.
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• A/C compressor magnetic clutch engagement is stuck.</li><li>• A/C relay is stuck closed.</li><li>• Short to GND in wiring harness between A/C switch and PCM</li><li>• Short to GND in wiring harness between A/C relay and PCM</li><li>• Short circuit to battery power in A/C relay to magnetic clutch</li></ul>

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Connect the M-MDS to the DLC-2.  Turn the ignition switch to the ON position (Engine off).  Retrieve any DTCs.  Are there any DTCs displayed?	Yes	<b>DTC is displayed:</b>  Go to the appropriate DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .)
		No	<b>No DTC is displayed:</b>  Go to the next step.
2	Start the engine and idle it.  Turn the A/C switch on.  Remove the A/C relay.  Does the A/C magnetic clutch disengage?	Yes	Inspect for the following: <ul style="list-style-type: none"><li>• A/C relay is stuck closed.</li><li>• Short to GND in wiring harness between A/C relay and PCM terminal 11.</li></ul> If both items normal, go to the next step.



		No	<p>Inspect if circuit between the A/C relay and magnetic clutch shorts to battery power circuit.</p> <p>If the circuit is normal, inspect the magnetic clutch for stuck engagement or clearance.</p>
3	<p>Disconnect refrigerant pressure switch connector.</p> <p>Start the engine and turn A/C switch on.</p> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>A/C should not work when disconnecting connector. If A/C remains working, short to GND circuit may be present.</li> </ul> <p>Does the A/C remain working?</p>	Yes	Inspect for short to GND in wiring harness between refrigerant pressure switch and PCM terminal 1AU.
		No	Go to the next step.
4	<p>Reconnect refrigerant pressure switch connector.</p> <p>Turn off A/C switch.</p> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>A/C should not work when turning A/C switch off. If A/C remains working, short to GND circuit may be present.</li> </ul> <p>Does A/C remain working?</p>	Yes	<p>Inspect following:</p> <ul style="list-style-type: none"> <li>Short to GND in wiring harness between A/C switch and A/C amplifier</li> <li>Short to GND circuit between A/C amplifier and refrigerant pressure switch</li> </ul>
		No	Inspect whether A/C switch is stuck closed.
5	<ul style="list-style-type: none"> <li>Verify test results. <ul style="list-style-type: none"> <li>If normal, return to diagnostic index to service any additional symptoms.</li> </ul> <p>(See <b>SYMPTOM DIAGNOSTIC INDEX [LF]</b>.)</p> <li>If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. <ul style="list-style-type: none"> <li>If vehicle is repaired, troubleshooting completed.</li> <li>If vehicle is not repaired or additional diagnostic information is not available, replace the PCM.</li> </ul> <p>(See <b>PCM REMOVAL/INSTALLATION [LF]</b>.)</p> </li> </li></ul>		



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### NO.26 EXHAUST SULPHUR SMELL [LF]

26	EXHAUST SULPHUR SMELL
<b>DESCRIPTION</b>	Rotten egg smell (sulphur) from exhaust
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Electrical connectors are disconnected or connected poorly</li> <li>• Charcoal canister malfunction</li> <li>• Vacuum lines are disconnected or connected improperly.</li> <li>• Improper fuel pressure</li> <li>• Poor fuel quality</li> </ul> <p><b>WARNING:</b></p> <p>The following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before servicing fuel system:</p> <ul style="list-style-type: none"> <li>• Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.</li> <li>• Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.</li> </ul> <p>(See <b>BEFORE SERVICE PRECAUTION [LF]</b>.)</p> <p>(See <b>AFTER SERVICE PRECAUTION [LF]</b>.)</p> <p><b>CAUTION:</b></p> <ul style="list-style-type: none"> <li>• Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Are any driveability or exhaust smoke	Yes	Go to the appropriate flow chart.

	concerns present?	No	Go to the next step.
2	Inspect the following: <ul style="list-style-type: none"> <li>• Electrical connections</li> <li>• Vacuum lines</li> <li>• Fuel quality</li> </ul> Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 2.
3	Connect the M-MDS to the DLC-2.  Turn the ignition switch to the ON position (Engine off).  Retrieve any DTCs.  Are there any DTCs displayed?	Yes	<b>DTC is displayed:</b>  Go to the appropriate DTC inspection.  (See <b>DTC TABLE [LF]</b> .)
		No	<b>No DTC is displayed:</b>  Go to the next step.
4	Install the fuel pressure gauge between the fuel pipe and the fuel distributor.  Start engine and idle it.  Is fuel line pressure correct at idle?  (See <b>FUEL LINE PRESSURE INSPECTION [LF]</b> .)	Yes	Go to the next step.
		No	<b>Low:</b>  Inspect fuel pump relay and fuel pump circuit.  Inspect the fuel line for clogging.  If there is no malfunction, replace the fuel pump unit.  (See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF]</b> .)  <b>High:</b>  Replace the fuel pump unit.  (See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF]</b> .)
5	Inspect the charcoal canister for fuel saturation.  Is excess amount of liquid fuel present in canister?	Yes	Replace the charcoal canister.
		No	Inspect the fuel tank vent system.  If the fuel tank vent system is normal, suggest trying a different brand since sulphur content can vary in different fuels.  If the fuel tank vent system is not normal, repair or replace the malfunctioning part.
6	<ul style="list-style-type: none"> <li>• Verify test results.               <ul style="list-style-type: none"> <li>▪ If normal, return to diagnostic index to service any additional</li> </ul> </li> </ul>		

symptoms.

(See [SYMPTOM DIAGNOSTIC INDEX \[LF\]](#).)

- If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.
  - If vehicle is repaired, troubleshooting completed.
  - If vehicle is not repaired or additional diagnostic information is not available, replace the PCM.

(See [PCM REMOVAL/INSTALLATION \[LF\]](#).)

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NO.27 FUEL REFILL CONCERNS [LF]

27	FUEL REFILL CONCERNS
DESCRIPTION	<ul style="list-style-type: none"><li>Fuel tank is not filled smoothly.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Clogged EVAP pipes</li><li>Nonreturn valve malfunction</li><li>Improper use of fuel nozzle</li><li>Inadequate fuel filling speed</li></ul> <p><b>WARNING:</b></p> <ul style="list-style-type: none"><li>The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:<ul style="list-style-type: none"><li>Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.</li><li>Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.</li></ul>(See <b>BEFORE SERVICE PRECAUTION [LF].</b>) (See <b>AFTER SERVICE PRECAUTION [LF].</b>)</li></ul> <p><b>CAUTION:</b></p> <ul style="list-style-type: none"><li>Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.</li></ul>

Diagnostic procedure

STEP	INSPECTION	ACTION

1	<p>Connect the M-MDS to the DLC-2.</p> <p>Turn the ignition switch to the ON position (Engine off).</p> <p>Retrieve any DTCs.</p> <p>Are there any DTCs displayed?</p>	Yes	<p><b>DTC is displayed:</b></p> <p>Go to the appropriate DTC inspection.</p> <p>(See <a href="#">DTC TABLE [LF]</a>.)</p>
2	<p>Remove the fuel-filler pipe.</p> <p>Make sure the nonreturn valve is installed properly.</p> <p>Inspect nonreturn valve operation.</p> <p>Is the nonreturn valve normal?</p>	Yes	<p>Inspect for the following:</p> <ul style="list-style-type: none"> <li>• Improper use of fuel nozzle</li> <li>• Inadequate fuel filling speed</li> </ul>
3	<p>• Verify test results.</p> <ul style="list-style-type: none"> <li>▪ If normal, return to diagnostic index to service any additional symptoms.</li> </ul> <p>(See <a href="#">SYMPTOM DIAGNOSTIC INDEX [LF]</a>.)</p> <ul style="list-style-type: none"> <li>▪ If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.</li> </ul> <ul style="list-style-type: none"> <li>• If vehicle is repaired, troubleshooting completed.</li> <li>• If vehicle is not repaired or additional diagnostic information is not available, replace the PCM.</li> </ul> <p>(See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a>.)</p>	No	<p><b>Nonreturn valve is installed improperly:</b></p> <ul style="list-style-type: none"> <li>• Reinstall nonreturn valve to proper position.</li> </ul> <p><b>Nonreturn valve does not operate properly:</b></p> <ul style="list-style-type: none"> <li>• Replace nonreturn valve.</li> </ul>

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NO.29 SPARK PLUG CONDITION [LF]

29	SPARK PLUG CONDITION
DESCRIPTION	Incorrect spark plug condition
POSSIBLE CAUSE	<p><b>NOTE:</b></p> <ul style="list-style-type: none"><li>Inspecting spark plugs condition can determine whether problem is related to a specific cylinder or possibly all cylinders.</li></ul> <p><b>Wet/carbon stuck on specific plug:</b></p> <ul style="list-style-type: none"><li>Spark—Weak, not visible</li><li>Air/fuel mixture—Excessive fuel injection volume</li><li>Compression—No compression, low compression</li><li>Malfunction spark plug</li></ul> <p><b>Grayish white with specific plug:</b></p> <ul style="list-style-type: none"><li>Air/fuel mixture—Insufficient fuel injection volume</li><li>Malfunction spark plug</li></ul> <p><b>Wet/carbon is stuck on all plugs:</b></p> <ul style="list-style-type: none"><li>Spark—Spark weak</li><li>Air/fuel mixture—Too rich</li><li>Compression—Low compression</li><li>Clogging in intake/exhaust system</li></ul> <p><b>Grayish white with all plugs:</b></p> <ul style="list-style-type: none"><li>Air/fuel mixture—Too lean</li></ul> <p><b>WARNING:</b></p> <p>The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:</p> <ul style="list-style-type: none"><li>Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.</li><li>Fuel line spills and leakage are dangerous. Fuel can ignite and cause</li></ul>



serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.

(See **BEFORE SERVICE PRECAUTION [LF]**.)

(See **AFTER SERVICE PRECAUTION [LF]**.)

**CAUTION:**

- Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.

**Diagnostic procedure**

STEP	INSPECTION	RESULTS	ACTION
1	Remove all the spark plugs. Inspect spark plug condition. Is spark plug condition normal?	Yes	Troubleshooting completed.
		No	<b>Specific plug is wet or covered with carbon:</b> Go to the next step.  <b>Specific plug looks grayish white:</b> Go to Step 7.  <b>All plugs are wet or covered with carbon:</b> Go to Step 9.  <b>All plugs look grayish white:</b> Go to Step 15.
2	Are the spark plug wet/covered with carbon by the engine oil?	Yes	Inspect all areas related to oil, working up and down.
		No	Go to the next step.
3	Inspect the spark plug for the following: <ul style="list-style-type: none"> <li>• Cracked insulator</li> <li>• Heat range</li> <li>• Air gap</li> <li>• Worn electrode</li> </ul> Is the spark plug normal?	Yes	Go to the next step.
		No	Replace the spark plug.  (See <b>SPARK PLUG REMOVAL/INSTALLATION [LF]</b> .)
4	Inspect compression pressure at	Yes	Go to the next step.

	<p>suspected malfunctioning cylinder.</p> <p>Is compression pressure correct?</p> <p>(See <b>COMPRESSION INSPECTION [LF].</b>)</p>	No	Repair or replace the malfunctioning part.
5	<p>Install all spark plugs.</p> <p>Perform the spark test at suspected malfunctioning cylinder.</p> <p>Is strong blue spark visible?</p> <p>(Compare with normal cylinder.)</p>	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part.
6	<p>Install the fuel pressure gauge between fuel filter and fuel distributor.</p> <p>Short check connector terminal F/P to body GND using a jumper wiring.</p> <p>Turn the ignition switch to the ON position (Engine off).</p> <p>Is the fuel line pressure correct with the ignition switch at ON?</p> <p>(See <b>FUEL LINE PRESSURE INSPECTION [LF].</b>)</p>	Yes	<p>Inspect fuel injector for the following:</p> <ul style="list-style-type: none"> <li>• Open or short circuit in injector</li> <li>• Leakage</li> <li>• Injection volume</li> </ul>
		No	<p><b>Zero or low:</b></p> <p>Inspect the fuel pump relay and fuel pump circuit.</p> <p>Inspect the fuel line for clogging.</p> <p>If there is no malfunction, replace the fuel pump unit.</p> <p>(See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF].</b>)</p> <p><b>High:</b></p> <p>Replace the fuel pump unit.</p> <p>(See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF].</b>)</p>
7	<p>Inspect the spark plug for the following.</p> <ul style="list-style-type: none"> <li>• Heat range</li> <li>• Air gap</li> </ul> <p>Is the spark plug normal?</p>	Yes	Go to the next step.
		No	<p>Replace the spark plug.</p> <p>(See <b>SPARK PLUG REMOVAL/INSTALLATION [LF].</b>)</p>
8	<p>Remove the suspected fuel injector.</p> <p>Inspect the following:</p> <ul style="list-style-type: none"> <li>• Resistance</li> </ul> <p>(See <b>FUEL INJECTOR INSPECTION [LF].</b>)</p> <ul style="list-style-type: none"> <li>• Fuel injection volume</li> </ul>	Yes	<p>Inspect for open circuit in wiring harness between fuel injector connector terminal B and PCM at the following terminals:</p> <ul style="list-style-type: none"> <li>• <b>For No.1 cylinder: 2BB</b></li> <li>• <b>For No.2 cylinder: 2BC</b></li> <li>• <b>For No.3 cylinder: 2BD</b></li> </ul>

	(See <b>FUEL INJECTOR INSPECTION [LF].</b> )		• <b>For No.4 cylinder: 2AZ</b>
	Are all above items normal?	No	Replace the fuel injector.
9	Is the air cleaner element free of clogging?	Yes	Go to the next step.
		No	Replace the air cleaner element.
10	Perform the spark test.  (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF].</b> )  Is strong blue spark visible at each cylinder?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part.
11	Install the fuel pressure gauge between the fuel filter and fuel distributor.  Short check connector terminal F/P to body GND using a jumper wiring.  Turn the ignition switch to the ON position (Engine off).  Is the fuel line pressure correct with ignition switch at ON?  (See <b>FUEL LINE PRESSURE INSPECTION [LF].</b> )	Yes	Go to the next step.
		No	<b>Zero or low:</b>  Inspect the fuel pump relay and fuel pump circuit.  Inspect the fuel line for clogging.  If there is no malfunction, replace the fuel pump unit.  (See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF].</b> )  <b>High:</b>  Replace the fuel pump unit.  (See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF].</b> )
12	Inspect the following PIDs:  • ECT  • O2S11 (When engine can be started.)  • O2S12 (When engine can be started.)  • MAF  (See <b>PCM INSPECTION [LF].</b> )  Are PIDs normal?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part.
13	Perform the purge control inspection.  (When engine can be started.)	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part.

	(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF].</b> )  Is the purge control correct?		
14	Perform compression inspection.  (See <b>COMPRESSION INSPECTION [LF].</b> )  Is compression correct?	Yes	Visually inspect for deformed exhaust system part.
		No	Repair or replace the malfunctioning part.
15	When the engine cannot be started, inspect the intake-air system for air leakage.  When the engine can be started, perform intake manifold vacuum inspection.  Is air sucked in from intake-air system?	Yes	Repair or replace the malfunctioning part.
		No	Go to the next step.
16	Install the fuel pressure gauge between the fuel filter and the fuel distributor.  Short check connector terminal F/P to body GND using a jumper wiring.  Turn the ignition switch to the ON position (Engine off).  Is fuel line pressure correct with the ignition switch at ON?  (See <b>FUEL LINE PRESSURE INSPECTION [LF].</b> )	Yes	Inspect the following PIDs: <ul style="list-style-type: none"><li>• ECT</li><li>• O2S11</li><li>• O2S12</li><li>• MAF<ul style="list-style-type: none"><li>◦ (See <b>PCM INSPECTION [LF].</b>)</li></ul></li></ul> Inspect PCM GND condition.
		No	<b>Zero or low:</b>  Inspect the fuel pump relay and fuel pump circuit.  Inspect the fuel line for clogging.  If there is no malfunction, replace the fuel pump unit.  (See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF].</b> )  <b>High:</b>  Replace the fuel pump unit.  (See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF].</b> )
17	<ul style="list-style-type: none"><li>• Verify test results.<ul style="list-style-type: none"><li>▪ If normal, return to diagnostic index to service any additional symptoms.</li></ul></li></ul>		

(See [SYMPTOM DIAGNOSTIC INDEX \[LF\]](#).)

- If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.
  - If vehicle is repaired, troubleshooting completed.
  - If vehicle is not repaired or additional diagnostic information is not available, replace the PCM.

(See [PCM REMOVAL/INSTALLATION \[LF\]](#).)

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## 2008 - MX-5 - Engine

### ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]

#### Input Signal System Inspection Procedure

1. Find an irregular signal. (See [ENGINE CONTROL SYSTEM OPERATION INSPECTION \[LF\]](#).)
2. Locate source. (See [ENGINE CONTROL SYSTEM OPERATION INSPECTION \[LF\]](#).)
3. Repair or replace the malfunctioning part.
4. Confirm that the irregular signal is no longer detected.

#### Finding irregular signals

While referring to [ON-BOARD DIAGNOSTIC TEST \[LF\]](#), use the PID/DATA monitor and record function to inspect the input signal system relating to the problem.

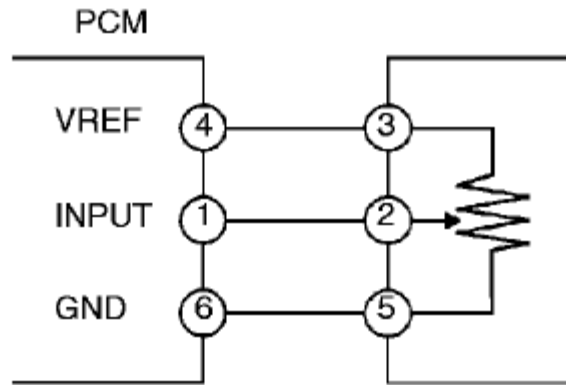
1. Start the engine and idle the vehicle. You can assume that any signals that are out of specification by a wide margin are irregular.
2. When recreating the problem, any sudden change in monitor input signals that is not intentionally created by the driver can be determined as irregular.

#### Locating the source of unusual signals

#### CAUTION:

- Compare the M-MDS monitor voltage with the measurement voltage using the digital measurement system function. If you use another tester, misreading may occur.
- When measuring voltage, attach the tester GND to the GND of the PCM that is being tested, or to the engine itself. If this is not performed, the measured voltage and actual voltage may differ.
- After connecting the pin to a waterproof coupler, confirming continuity and measuring the voltage, inspect the waterproof connector for cracks. If there are any, use sealant to fix them. Failure to do this may result in deterioration of the wiring harness or terminal from water damage, leading to problems with the vehicle.

#### Variable resistance type 1 (TP sensor and EGR boost sensor)



### Input signal system inspection for variable resistance type 1

1. When an irregular signal is detected, measure the #1 PCM terminal voltage.

- If the #1 terminal voltage and the M-MDS monitor voltage are the same, proceed to the next step.
- If there is a difference of **0.5 V or more**, inspect for the following points concerning the PCM connector:
  - Female terminal opening is loose.
  - Coupler (pin holder) damage
  - Pin discoloration (blackness)
  - Harness/pin crimp is loose or disconnected.

2. Measure the #2 sensor terminal voltage.

- If there is a **0.5 V or more** difference between the sensor and the M-MDS voltages, inspect the wiring harness for open or short circuits.
- If the sensor and the M-MDS voltages are the same, inspect for the following points concerning the sensor connector:
  - Female terminal opening is loose.
  - Coupler (pin holder) damage
  - Pin discoloration (blackness)
- If there are no problems, proceed to next investigation below.

### Standard power supply system inspection for variable resistance type 1

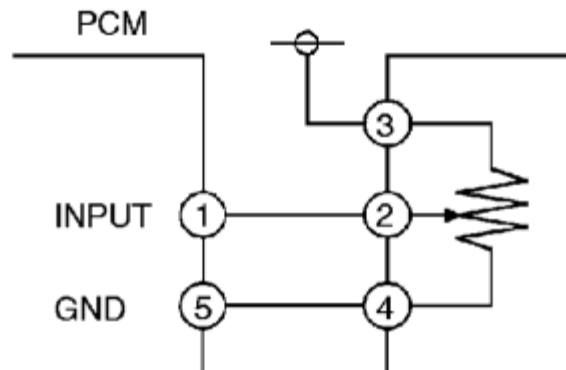
- Confirm that the #3 terminal is at **5 V**.
  - If the measured voltage on the #3 terminal is **5 V**, inspect the following points on the sensor connector.
  - If there is no problem, inspect for the following:

- Female terminal opening is loose.
- Coupler (pin holder) damage
- Pin discoloration (blackness)
- If the #3 terminal measures other than **5 V**, inspect for the following:
  - Open or short circuit in wiring harness
  - Harness/pin crimp is loose or disconnected.

#### GND system inspection for variable resistance type 1

- Confirm that terminal sensor #5 is at **0 V**.
  - If it is at **0 V**, inspect the sensor.
    - If necessary, replace the sensor.
  - If not, inspect for the following:
    - Open or short circuit in wiring harness
    - Female terminal opening is loose causing an open or short circuit in wiring harness
    - Coupler (pin holder) damage
    - Pin discoloration (blackness)
    - Harness/pin crimp is loose or disconnected.

#### Variable resistance type 2 (mass air flow (MAF) sensor and VSS)



#### GND system inspection for variable resistance type 2

- Confirm that terminal sensor #4 is at **0 V**.



- If it is at **0 V**, inspect the sensor.
  - If necessary, replace the sensor.
- If not at **0 V**, inspect for the following:
  - Open circuit in wiring harness
  - Female terminal opening is loose.
  - Coupler (pin holder) damage
  - Pin discoloration (blackness)
  - Harness/pin crimp is loose or disconnected.

#### Input signal system inspection for variable resistance type 2

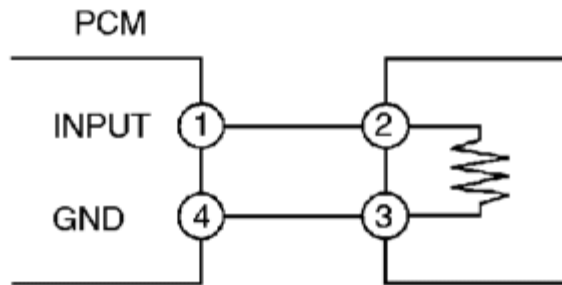
1. When an irregular signal is detected, measure the #1 PCM terminal voltage.
  - If the #1 terminal voltage and the M-MDS monitor voltage are the same, proceed to the next step.
  - If there is a difference of **0.5 V or more**, inspect for the following points concerning the PCM connector:
    - Female terminal opening is loose.
    - Coupler (pin holder) damage
    - Pin discoloration (blackness)
    - Harness/pin crimp is loose or disconnected.
2. Measure the #2 sensor terminal voltage.
  - If there is a **0.5 V or more** difference between the sensor and the M-MDS voltages, inspect the wiring harness for open or short circuits.
  - If the sensor and the M-MDS voltages are the same, inspect the following points concerning the sensor connector:
    - Female terminal opening is loose.
    - Coupler (pin holder) damage
    - Pin discoloration (blackness)
    - Harness/pin crimp is loose or disconnected.
  - If there are no problems, proceed to next investigation below.

#### Electrical supply system inspection for variable resistance type 2

- Confirm that the sensor #3 terminal is **B+**.
  - If the measured voltage on the #3 terminal is **B+**, inspect the following points on the sensor connector.

- If there is no problem, inspect for the following:
  - Female terminal opening is loose.
  - Coupler (pin holder) damage
  - Pin discoloration (blackness)
- If the #3 terminal measures other than **B+**, inspect the following:
  - Open or short circuit in wiring harness
  - Harness/pin crimp is loose or disconnected.

#### Thermistor type (IAT sensor and ECT sensor)



#### Input signal system inspection for thermistor type

1. When an irregular signal is detected, measure the #1 PCM terminal voltage.
  - If the #1 terminal voltage and the M-MDS monitor voltage are the same, proceed to the next step.
  - If there is a difference of **0.5 V or more**, inspect the following points concerning the PCM connector:
    - Female terminal opening loose
    - Coupler (pin holder) damage
    - Pin discoloration (blackness)
    - Harness/pin crimp is loose or disconnected.
2. Measure the #2 sensor terminal voltage.
  - If there is a **0.5 V or more** difference between the sensor and the M-MDS voltages, inspect the wiring harness for open or short circuits.
  - If the sensor and the M-MDS voltages are the same, inspect the following points concerning the sensor connector:

- Female terminal opening is loose.
- Coupler (pin holder) damage
- Pin discoloration (blackness)
- Harness/pin crimp is loose or disconnected.
- If there are no problems, proceed to next investigation below.

#### **GND system inspection for thermistor type**

- Confirm that terminal sensor #3 is at **0 V**.
  - If it is at **0 V**, inspect the sensor. If necessary, replace the sensor.
  - If not, inspect for the following:
    - Open circuit in wiring harness
    - Female terminal opening is loose.
    - Coupler (pin holder) damage
    - Pin discoloration (blackness)
    - Harness/pin crimp is loose or disconnected.

#### **Main Relay Operation Inspection**

1. Verify that the main relay clicks when the ignition switch is turned to ON position and off.
  - If there is no operation sound, inspect the following:
    - Main relay (See **RELAY INSPECTION**.)
    - Harness and connector between battery and main relay terminal A.
    - Harness and connector between PCM terminal 1Q and main relay terminal E.

#### **Intake Manifold Vacuum Inspection**

1. Verify that the intake air hoses are installed securely.
2. Disconnect the vacuum hose connecting the intake manifold and the purge solenoid valve (purge solenoid valve side) and install the vacuum gauge.
3. Warm up the engine.
4. Measure the intake manifold vacuum while idling (no load) using the vacuum gauge. (See **INTAKE MANIFOLD VACUUM INSPECTION [LF]**.)
  - If not within the specification, perform the following inspections.

- Compression pressure (See [COMPRESSION INSPECTION \[LF\].](#))
- Air intake
  - Each hose installation part
  - Throttle body installation part
  - Fuel injector installation part
  - PCV valve installation part
  - Dynamic chamber installation port
  - Intake manifold installation part

## Electronic Throttle Control System Inspection

### Engine coolant temperature compensation inspection

1. Connect the M-MDS to the DLC-2.
2. Access the following PIDs:
  - ECT
  - IAT
  - RPM
3. Verify that the engine is cold, then start the engine.
4. Verify that the engine speed decreases as the engine warms up.
  - If the engine speed does not decrease or decreases slowly, inspect the following:
    - ECT sensor and related wiring harness  
(See [ENGINE COOLANT TEMPERATURE \(ECT\) SENSOR INSPECTION \[LF\].](#))
    - Electronic throttle body and related wiring harness  
(See [THROTTLE BODY INSPECTION \[LF\].](#))

### Load compensation inspection

1. Start the engine and idle it.
2. Connect the M-MDS to the DLC-2.
3. Verify that P0506, P0507, or P0511 is not displayed.
  - If P0506, P0507 or P0511 are displayed, perform DTC inspection.

(See **DTC TABLE [LF]**.)

4. Access the RPM PID.

**NOTE:**

- Excludes temporary idle speed drop just after the loads are turned on.

5. Verify that the engine speed is within the specification under each load condition. (See **ENGINE TUNE-UP [LF]**.)

- If load condition is not as specified, inspect the following:
  - A/C switch and related wiring harness  
(See **CLIMATE CONTROL UNIT INSPECTION**.)
  - Fan switch and related wiring harness  
(See **CLIMATE CONTROL UNIT INSPECTION**.)

**Throttle position (TP) sweep inspection**

1. Connect the M-MDS to the DLC-2.

2. Turn the ignition switch to the ON position.

3. Verify that none of the following DTC are displayed:

- P0122, P0123, P0222, P0223, P0638, P2101, P2107, P2108, P2109, P2112, P2119, P2122, P2123, P2127, P2128, P2135, P2138
  - If any one DTC is displayed, perform DTC inspection.

4. Access TP\_REL PID.

5. Verify that the PID reading is within the CTP value. (See **PCM INSPECTION [LF]**.)

- If the PID reading is out of range, perform the following:
  - Remove the air duct from the throttle valve body.
  - Verify that the throttle valve opens when the accelerator pedal is depressed.
    - If the throttle valve opens, inspect the throttle position sensor and related wiring harness.
    - If the throttle valve does not open, inspect the throttle actuator control motor and related wiring harness.

6. Gradually depress the throttle pedal and verify that the PID reading increases accordingly.

- If the PID reading drops momentarily, inspect the following:
  - Throttle position sensor

7. Fully depress the throttle pedal and verify that the PID reading is within WOT value. (See **PCM INSPECTION [LF]**.)

- If the PID reading is out of range, perform the followings:
  - Remove the air duct from throttle valve body.
  - Verify that the throttle valve opens when throttle pedal is depressed.
    - If the throttle valve opens, inspect the throttle position sensor and related wiring harness.
    - If the throttle valve does not open, inspect the throttle actuator control motor and related wiring harness.

## Variable Intake air Control Operation Inspection

1. Start the engine.
2. Inspect the rod operation. (See **VARIABLE INTAKE AIR SHUTTER VALVE ACTUATOR INSPECTION [LF]**.)
  - If the rod operation is not as specified, inspect as follows:
    - a. Stop the engine.
    - b. Connect the M-MDS to the DLC-2.
    - c. Verify that DTC P0661 or P0662 is not displayed.
      - If DTC P0661 or P0662 is shown, perform DTC inspection.  
(See **DTC TABLE [LF]**.)
    - d. Inspect the variable intake air solenoid valve. (See **VARIABLE INTAKE AIR SOLENOID VALVE INSPECTION [LF]**.)
      - If the variable intake air solenoid valve is not normal, replace the variable intake air solenoid valve.  
(See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [LF]**.)
      - If the variable intake air solenoid valve is normal, inspect the following:
        - Vacuum hose and vacuum chamber for looseness or damage
        - Shutter valve actuator  
(See **VARIABLE INTAKE AIR SHUTTER VALVE ACTUATOR INSPECTION [LF]**.)
        - Shutter valve stuck open or closed

## Variable Tumble Control Operation Inspection

1. Connect the M-MDS to the DLC-2.

2. Access ECT PID.
3. Verify that ECT PID is **below 60 °C {140 °F}**.
4. Start the engine.
5. Inspect rod operation under the following conditions: **Rod operation**

<b>Accelerator pedal position</b>	Release	Depress
<b>Shutter valve actuator</b>	Operate	Not operate

- If the rod operation is not specified, inspect as follows:
  - a. Verify that DTC No. P2004, P2006, P2009 or P2010 is not displayed.
    - If DTC No. P2004, P2006, P2009 or P2010 are shown, perform DTC inspection.  
(See **DTC TABLE [LF]**.)
  - b. Inspect the variable tumble solenoid valve. (See **VARIABLE TUMBLE SOLENOID VALVE INSPECTION [LF]**.)
    - If the variable tumble solenoid valve is not normal, replace the variable tumble solenoid valve.  
(See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [LF]**.)
    - If the variable tumble solenoid valve is normal, inspect the following:
      - Vacuum hose and vacuum chamber for looseness or damage
      - Shutter valve actuator  
(See **VARIABLE TUMBLE SOLENOID VALVE INSPECTION [LF]**.)
      - Shutter valve stuck open or closed

## Fuel Injector Operation Inspection

If simulation function of M-MDS is used:

STEP	INSPECTION	RESULTS	ACTION
1	Start the engine and warm it up until normal operating temperature.	Yes	Fuel injector work properly.
	Connect the M-MDS to DLC-2. Select the INJ_1, INJ_2, INJ_3, and INJ_4	No	Engine speed does not drop any cylinders: Go to the next step.

	<p>PIDs</p> <p>Turn the fuel injector from on to off using the PIDs for each cylinder.</p> <p>Does the engine speed drop?</p>		<p>Engine speed drop some cylinders:</p> <p>Go to Step 3.</p>
2	<p>Perform main relay operation inspection.</p> <p>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF].</b>)</p> <p>Does the main relay work properly?</p>	Yes	Go to the next step.
		No	Repair or replace malfunctioning parts.
3	<p>Inspect the fuel injector for suspected cylinder.</p> <p>(See <b>FUEL INJECTOR INSPECTION [LF].</b>)</p> <p>Is the fuel injector okay?</p>	Yes	<p>Inspect the following for suspected cylinder:</p> <ul style="list-style-type: none"> <li>Fuel injector power and/or GND systems related harness and connectors.</li> </ul>
		No	<p>Replace the fuel injector.</p> <p>(See <b>FUEL INJECTOR REMOVAL/INSTALLATION [LF].</b>)</p>
4	<p>Perform KOER self-test function using M-MDS.</p> <p>(See <b>KOEO/KOER SELF TEST [LF].</b>)</p> <p>Are DTC P0201, P0202, P0203 and/or P0204 present?</p>	Yes	<p>Go to appropriate DTC test.</p> <p>(See <b>DTC TABLE [LF].</b>)</p>
		No	Go to the next step.
5	<p>Inspect the fuel injector for suspected cylinder.</p> <p>(See <b>FUEL INJECTOR INSPECTION [LF].</b>)</p> <p>Is the fuel injector okay?</p>	Yes	<p>Inspect the following for suspected cylinder:</p> <ul style="list-style-type: none"> <li>PCM terminals (pulled-out pins, corrosion)</li> <li>Fuel injector terminals (pulled-out pins, corrosion)</li> </ul>
		No	<p>Replace the fuel injector.</p> <p>(See <b>FUEL INJECTOR REMOVAL/INSTALLATION [LF].</b>)</p>

**If simulation function of M-MDS is not used:**

STEP	INSPECTION	RESULTS	ACTION
1	<p>While cranking the engine, inspect for fuel injector operation sound at each cylinder using a soundscope.</p> <p>Is operation sound heard?</p>	Yes	Fuel injector operation is normal.
		No	<b>All cylinders not heard:</b>



			Go to the next step. <b>Some cylinders not heard:</b> Go to Step 3.
2	Perform main relay operation inspection. Is main relay operation normal?	Yes	Inspect the following: <ul style="list-style-type: none"> <li>Fuel injector power system related wiring harness and connectors</li> <li>PCM connectors</li> <li>Fuel injector GND and related wiring harness and connectors</li> </ul>
		No	Repair or replace malfunctioning parts.
3	Switch fuel injector connector of not operating fuel injector with operating fuel injector. Is operation sound heard?	Yes	Go to the next step.
		No	Replace the fuel injector.
4	Are wiring harness and connectors of not operation fuel injector normal? (Open or short)	Yes	Inspect PCM terminal voltage of fuel injector signal.
		No	Repair or replace malfunctioning parts.

## Fuel Cut Control System Inspection

### NOTE:

- This inspection has to perform after the Fuel Injector Operation Inspection.

#### If simulation function of M-MDS is used:

- Warm up the engine and idle it.
- Connect the M-MDS to DLC-2.
- Select the RPM and FUELPW1 PIDs.
- Monitor the both PIDs while performing the following steps.
  - Depress the accelerator pedal and increase the RPM PID to **4,000 rpm**.

b. Quickly release the accelerator pedal (brake pedal is not depressed) and verify that the FUELPW1 PID is **0 ms.**, and **2—5 ms.** when the RPM PID drops **below 1,200 rpm.**

- If not as specified, inspect the following.
  - ECT sensor and related harness  
(See **ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [LF].**)
  - Neutral switch and related harness  
(See **NEUTRAL SWITCH INSPECTION [LF].**)
  - Clutch switch and related harness  
(See **CLUTCH PEDAL POSITION (CPP) SWITCH INSPECTION [LF].**)

**If simulation function of M-MDS is not used:**

1. Warm up the engine and idle it.

2. Measure the fuel injector control signal wave profile using the oscilloscope while performing the following steps.

a. Depress the accelerator pedal and increase the engine speed to **4,000 rpm.**

b. Quickly release the accelerator pedal (brake pedal is not depressed) and verify that the wave profile constant **B+**, and appears wave, when the engine speed drops **below 2,200 rpm.** (See **PCM INSPECTION [LF].**)

- If not as specified, inspect the following.
  - ECT sensor and related harness  
(See **ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [LF].**)
  - Neutral switch and related harness (MT)  
(See **NEUTRAL SWITCH INSPECTION [LF].**)
  - Clutch switch and related harness (MT)  
(See **CLUTCH PEDAL POSITION (CPP) SWITCH INSPECTION [LF].**)
  - TR switch and related wiring harness (AT)  
(See **TRANSMISSION RANGE (TR) SWITCH INSPECTION [SJ6A-EL].**)

## **Fuel Pump Operation Inspection**

1. Remove the fuel-filler cap.

2. Turn the ignition switch to the ON position.
3. Turn the fuel pump relay from off to on using the FP PID and inspect if the operation sound is heard.
  - If no operation sounds is heard, proceed to next step.
4. Measure voltage at wiring harness side fuel pump connector terminal B.

#### Specification

- B+ (Ignition switch at on)
- If the voltage is as specified, inspect the following:
  - Fuel pump continuity
  - Fuel pump GND
  - Wiring harness between fuel pump relay and PCM terminal 1H
- If not as specified, inspect the following:
  - Fuel pump relay
  - Wiring harness connector (Main relay—fuel pump relay—fuel pump.)

### Fuel Pump Control System Inspection

1. Crank the engine and verify that fuel pump relay operation sound is heard.
2. If operation sound is not heard, inspect the following:
  - Fuel pump relay  
(See **RELAY INSPECTION**.)
  - Wiring harness and connectors (Main relay—fuel pump relay—PCM terminal 1H)

### Spark Test

1. Disconnect the fuel pump relay.
2. Verify that each ignition coil and connector is connected properly.
3. Inspect the ignition system in the following procedure.

#### WARNING:

- High voltage in the ignition system can cause strong electrical shock which can result in serious injury. Avoid direct contact to the vehicle body during the following spark test.

STEP	INSPECTION	ACTION
------	------------	--------

1	<ul style="list-style-type: none"> <li>• Disconnect the ignition coil from spark plugs.</li> <li>• Remove the spark plugs. <ul style="list-style-type: none"> <li>▪ Verify that the spark plugs do not have carbon deposits.</li> </ul> </li> <li>• Are the spark plugs normal?</li> </ul>	Yes	Go to the next step.
		No	Perform no-load racing at 4,000 rpm for 2 min, 2 times to burn off the carbon deposits.  Repeat Step 1.
2	<ul style="list-style-type: none"> <li>• Inspect the spark plugs for damage, wear, and proper plug gap.</li> <li>• Are the spark plugs normal?</li> </ul>	Yes	Go to the next step.
		No	Replace spark plugs, then go to the next step.
3	<ul style="list-style-type: none"> <li>• Reconnect the spark plugs to the ignition coil.</li> <li>• Ground the spark plugs to the engine.</li> <li>• Is a strong blue spark visible at each cylinder while cranking the engine?</li> </ul>	Yes	Ignition system is normal.
		No	<p><b>Some cylinders do not spark:</b></p> <ul style="list-style-type: none"> <li>• Go to the next step.</li> </ul> <p><b>All cylinders do not spark:</b></p> <ul style="list-style-type: none"> <li>• Go to Step 5.</li> </ul>
4	<ul style="list-style-type: none"> <li>• Inspect the following wiring harnesses for open or short: <ul style="list-style-type: none"> <li>▪ Ignition coil No.1 terminal C—PCM terminal 2BA</li> <li>▪ Ignition coil No.2 terminal C—PCM terminal 2AW</li> <li>▪ Ignition coil No.3 terminal C—PCM terminal 2AX</li> <li>▪ Ignition coil No.4 terminal C—PCM terminal 2AT</li> </ul> </li> <li>• Are the wiring harnesses normal?</li> </ul>	Yes	Inspect and replace the ignition coil.  (See <b>IGNITION COIL INSPECTION [LF]</b> .)
		No	Repair or replace the malfunctioning part, then go to Step 1.
5	<ul style="list-style-type: none"> <li>• Measure the voltage at terminal A in each ignition coils.</li> <li>• Is the voltage <b>B+</b>?</li> </ul>	Yes	Go to the next step.
		No	Inspect power supply circuit of ignition coils.

6	Verify continuity between each ignition coils terminal B and battery negative post.  Is there any continuity?	Yes	Go to the next step.
		No	Inspect GND circuit of ignition coils.
7	<ul style="list-style-type: none"> <li>Does the PCM connector or ignition coil connectors have poor connection?</li> </ul>	Yes	Repair or replace the connector, then go to Step 1.
		No	Go to the next step.
8	<ul style="list-style-type: none"> <li>Are the following parts normal? <ul style="list-style-type: none"> <li>CKP sensor and crankshaft pulley</li> </ul> </li> </ul>	Yes	Inspect for open or short circuit in wiring harness and connector of CKP sensor.
		No	Repair or replace the malfunctioning part, then go to Step 1.

## EGR Control System Inspection

### If simulation function of M-MDS is used:

- Crank the engine and verify that EGR valve operation (initial operation) sound is heard.
  - If the operation sound is not heard, connect the M-MDS to the DLC-2 and verify that the DTC P0403 is shown. Perform the DTC inspection. (See [DTC TABLE \[LF\]](#).)
- Start the engine run it at idle.
- Increase the step value of EGR valve **from 0 to 52** using SEGR PID of simulation function.
- Operate the EGR valve and inspect if the engine speed becomes unstable or the engine stalls.
  - If the engine speed will not change, proceed to following.
    - Stop the engine.
    - Remove the EGR valve.
    - Connect the EGR valve connector.
    - Turn the ignition switch to the ON position.
    - Increase the step value of EGR valve **from 0 to 52** using SEGRP PID.
    - Verify that the EGR valve operates according to SEGRP PID.
      - If the EGR valve is operated, clean the EGR valve and EGR gas passage.
      - If the EGR valve will not operate, replace the EGR valve.
- Start the engine and warm it up completely.

6. Access the following PIDs.

- ECT, RPM, SEGRP, APP1, APP2, TP, VSS

7. Idle the vehicle and verify that the SEGRP value is **0**.

8. Put the vehicle drive.

9. Depress the accelerator pedal and verify that the SEGRP value is increased.

- If the SEGRP value will not increase, inspect the VSS, TP and ECT PIDs.

(See **PCM INSPECTION [LF]**.)

10. Stop the vehicle and verify that the SEGRP value is returned to **0**.

**If simulation function of M-MDS is not used:**

1. Crank the engine and verify that EGR valve operation (initial operation) sound is heard.

- If the operation sound is not heard, connect the M-MDS to the DLC-2 and verify that the DTC P0403 is shown. Perform DTC inspection. (See **DTC TABLE [LF]**.)

2. Start the engine and idle it.

3. Warm up the engine to normal operating temperature.

4. Access the following PIDs:

- ECT, RPM, SEGRP\_DSD, APP1, APP2, VSS

5. Idle the vehicle and verify that the SEGRP value is 0.

6. Put the vehicle in drive.

7. Depress the accelerator pedal and verify that the SEGRP\_DSD value is increased.

- If the EGR valve increases, inspect the following:
  - EGR valve (stuck open or close)
  - Wiring harness and connectors (Main relay—EGR valve—PCM)
- If the SEGRP\_DSD value does not increase, inspect the VSS, APP1, APP2, TP and ECT PIDs. (See **PCM INSPECTION [LF]**.)

8. Stop the vehicle and verify that the SEGRP value returns to 0.

## **Purge Control System Inspection**

**If simulation function of M-MDS is used:**

1. Start the engine.

2. Disconnect the vacuum hose between the purge solenoid valve and the charcoal canister.

3. Put the finger to the purge solenoid valve and verify that there is no vacuum applied when the engine is cold.

- If there is a vacuum, inspect the following:
  - Wiring harness and connectors (Purge solenoid valve—PCM terminal 2C)
  - Purge solenoid valve (stuck open)

4. Connect the M-MDS to the DLC-2 and verify that the DTC P0443 is shown. Perform the DTC inspection.

(See [DTC TABLE \[LF\]](#).)

5. Select EVAPCP PID.

6. Increase the duty value of the purge valve to **50 %** and inspect if the operation sound of the valve is heard.

- If the operation sound is heard, inspect for the loose or damaged vacuum hose. (Intake manifold—purge solenoid valve—charcoal canister)
- If the operation sound is not heard, perform the purge solenoid valve inspection.

(See [PURGE SOLENOID VALVE INSPECTION \[LF\]](#).)

7. Warm up the engine to normal operating temperature.

8. Monitor the EVAPCP PID using the M-MDS, and drive the vehicle **approx. 2,000 rpm for 30 sec.** or more.

- If the EVAPCP PID is **0 %**, inspect the following.
  - MAF, APP1, APP2, TP\_REL and LOAD PIDs.

**If simulation function of M-MDS is not used:**

1. Start the engine.

2. Disconnect the vacuum hose between the purge solenoid valve and the charcoal canister.

3. Put the finger to the purge solenoid valve and verify that there is no vacuum applied when the engine is cold.

- If there is a vacuum, inspect the following:
  - Wiring harness and connectors (Purge solenoid valve—PCM terminal 2C)
  - Purge solenoid valve (stuck open)

4. Connect the M-MDS to the DLC-2 and verify that the DTC P0443 is shown. Perform the DTC inspection.

(See [DTC TABLE \[LF\]](#).)

5. Access EVAPCP and ECT PIDs.

6. Verify that the ECT PID is **more than 78 °C {173 °F}**.

- If the ECT PID reading indicates **less than 78 °C {173 °F}**, perform the ECT inspection.

7. Set the vehicle on the dynamometer or chassis roller.

#### **WARNING:**

- When the dynamometer or chassis roller is operating, there is a possibility that the operator may come into contact with or be caught up in the rotating parts, leading to serious injuries or death. When performing work while the dynamometer or chassis roller is operating, be careful not to come into contact with or caught up in any of the rotating parts.

8. Drive the vehicle **approx. 2,000 rpm for 30 sec.** or more.

- If there is no vacuum, inspect the following:
  - Wiring harness and connector (Main relay—purge solenoid valve—PCM terminal 2C)
  - Purge solenoid valve
  - MAF, APP1, APP2, TP and LOAD PISs
- If there is vacuum, inspect the following:
  - Vacuum hose (Purge solenoid valve—charcoal canister)

### **A/C Cut-off Control System Inspection**

1. Start the engine.
2. Turn the A/C switch and the fan switch on.
3. Verify that the A/C compressor magnetic clutch actuates.
  - If it does not actuate, go to symptom troubleshooting "No.23 A/C does not work sufficiently".
4. Fully open the throttle valve and verify that the A/C compressor magnetic clutch does not actuate for **2—5 s.**
  - If it actuates, inspect as follows:
    - A/C relay
    - Open or short to GND circuit in wiring harness and connectors (Ignition switch—A/C relay—PCM terminal 1I)
    - A/C related parts
    - APP1, APP2 PIDs

### **Cooling Fan Control System Inspection**



**If simulation function of M-MDS is used:**

1. Connect the M-MDS to DLC-2.
2. Start the engine and warm it up to normal operating temperature.
3. Perf Verify that the DTC P0480, P0481 or P0482 is not shown and cooling fan operating while the KOER self-test. (See [KOE0/KOER SELF TEST \[LF\]](#).)
4. Verify that the DTC P0480, P0481 or P0482 is not shown and cooling fan operating while the KOER self-test.
  - If the DTC P0480 is shown, perform the DTC troubleshooting procedure. (See [DTC P0480 \[LF\]](#).) (See [DTC P0481 \[LF\]](#).) (See [DTC P0482 \[LF\]](#).)
  - If the cooling fans do not operate while KOER self-test, proceed the followings:
    - a. Inspect the cooling fan motor and wiring harness between cooling fan motor and GND.
    - b. Select FAN1, FAN2 and FAN3 PIDs.
    - c. Turn ignition switch off and disconnect the cooling fan motor connector.
    - d. Verify that each cooling fan relay operating sound is heard, when turn each cooling fan relay to on from off using simulation function of FAN1, FAN2 and FAN3 PIDs.
      - If the operation sound is not heard, inspect for suspected cooling fan relay is stuck open or close.
      - If the operation sound is heard, inspect wiring harness and connector between all cooling fan relays and cooling fan motor.

**If simulation function of M-MDS is not used:**

1. Connect the M-MDS to DLC-2.
2. Start the engine and warm it up to normal operating temperature.
3. Perform the KOER self-test. (See [KOE0/KOER SELF TEST \[LF\]](#).)
4. Verify that the DTC P0480, P0481 or P0482 is not shown and cooling fan operating while the KOER self-test.
  - If the DTC P0480 is shown, perform the DTC troubleshooting procedure. (See [DTC P0480 \[LF\]](#).) (See [DTC P0481 \[LF\]](#).) (See [DTC P0482 \[LF\]](#).)
  - If the cooling fans do not operate while KOER self-test, proceed the followings:
    - a. Inspect the cooling fan motor and wiring harness between cooling fan motor and GND.
    - b. Turn the ignition switch to off.
    - c. Disconnect ECT sensor connector.
    - d. Verify that the operation sound heard form all cooling fan relays (No.1, No.2 and No.3), when the ignition switch to ON position.
      - If the operation sound is not heard, inspect for suspected cooling

fan relay is stuck open or close.

- If the operation sound is heard, inspect wiring harness and connector between all cooling fan relays and cooling fan motor.
- e. Turn the ignition switch off and disconnect the ECT sensor connector.
- f. Reconnect the ECT sensor and clear the DTC from PCM memory using the M-MDS.

## Variable Valve Timing Control System Operation Inspection

### If simulation function of M-MDS is used:

1. Warm up the engine to normal operating temperature.
2. Connect the M-MDS to DLC-2.
3. Start the engine and run it at idle.
4. Select VT DUTY1 PID.
5. Increase the oil control valve (OCV) duty value and verify that the engine idles roughly or stalls.
  - If as specified, inspect the timing belt component (valve timing deviation).
  - If not as specified, go to the next step.
6. Remove the oil control valve (OCV) with connector is connected.
7. Turn the ignition switch to the ON position.
8. Select VT DUTY1 PID.
9. Increase the oil control valve (OCV) duty value and verify that the spool valve operates in the advance direction.
  - If as specified, inspect the following hydraulic passage for clogging and/or leakage.
    - Oil pressure switch—oil control valve (OCV)
    - Oil control valve (OCV)—camshaft
    - Camshaft internal passage
  - If not as specified, inspect the following:
    - Oil control valve (OCV) operation
    - Harness and connectors for open or short (Oil control valve (OCV)—PCM terminal 2E)
10. If they are okay, replace the intake camshaft pulley (with a built-in variable valve timing actuator).

**If simulation function of M-MDS is not used:**

1. Start the engine and run it at idle.
  - If idling cannot be continued, go to Step 2.
  - If idling can be continued, go to Step 7.
2. Remove the oil control valve (OCV) and verify that the spool valve is at maximum retard position.
3. Connect the oil control valve (OCV).
4. Turn the ignition switch to the ON position.
5. Verify that the spool valve is at maximum retard position.
  - If the spool valve is stuck in the advance direction, inspect for the following:
    - Short circuit in wiring harnesses or connectors between the oil control valve (OCV) and the PCM.
6. Inspect the variable valve timing actuator. (See **VARIABLE VALVE TIMING ACTUATOR INSPECTION [LF]**.)
7. Disconnect oil control valve (OCV) connector.
8. Warm up the engine and idle it.
9. Apply battery voltage to the oil control valve (OCV) and verify that the engine idles roughly or stalls.
  - If the engine idles roughly or stalls, inspect the timing belt component (valve timing deviation).
  - If the engine does not idle roughly or stalls, go to the next step.
10. Remove the oil control valve (OCV) and perform spool valve operation inspection. (See **OIL CONTROL VALVE (OCV) INSPECTION [LF]**.)
  - If not as specified, inspect the following:
    - Oil control valve (OCV)
    - Harnesses and connectors between oil control valve (OCV) and PCM open or short.
  - If as specified, inspect the following hydraulic passages for clogging or leakage or both:
    - Oil pressure switch—oil control valve (OCV)
    - Oil control valve (OCV)—camshaft
    - Camshaft internal passage
11. If they are normal, replace the camshaft pulley (with built-in variable valve timing actuator).

## **Evaporative Emission (EVAP) System Leak Inspection**

- To verify that the problem has been fixed properly after repairs, the run drive cycle or EVAP system leak inspection must be performed.

#### EVAP system leak inspection using M-MDS

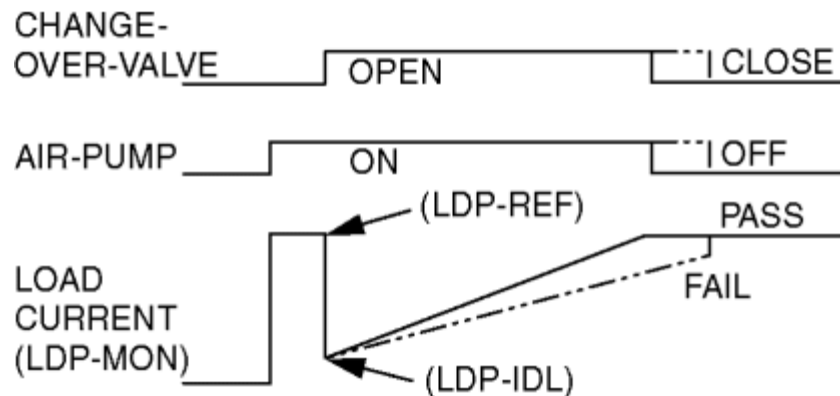
#### NOTE:

##### EVAP system test outline

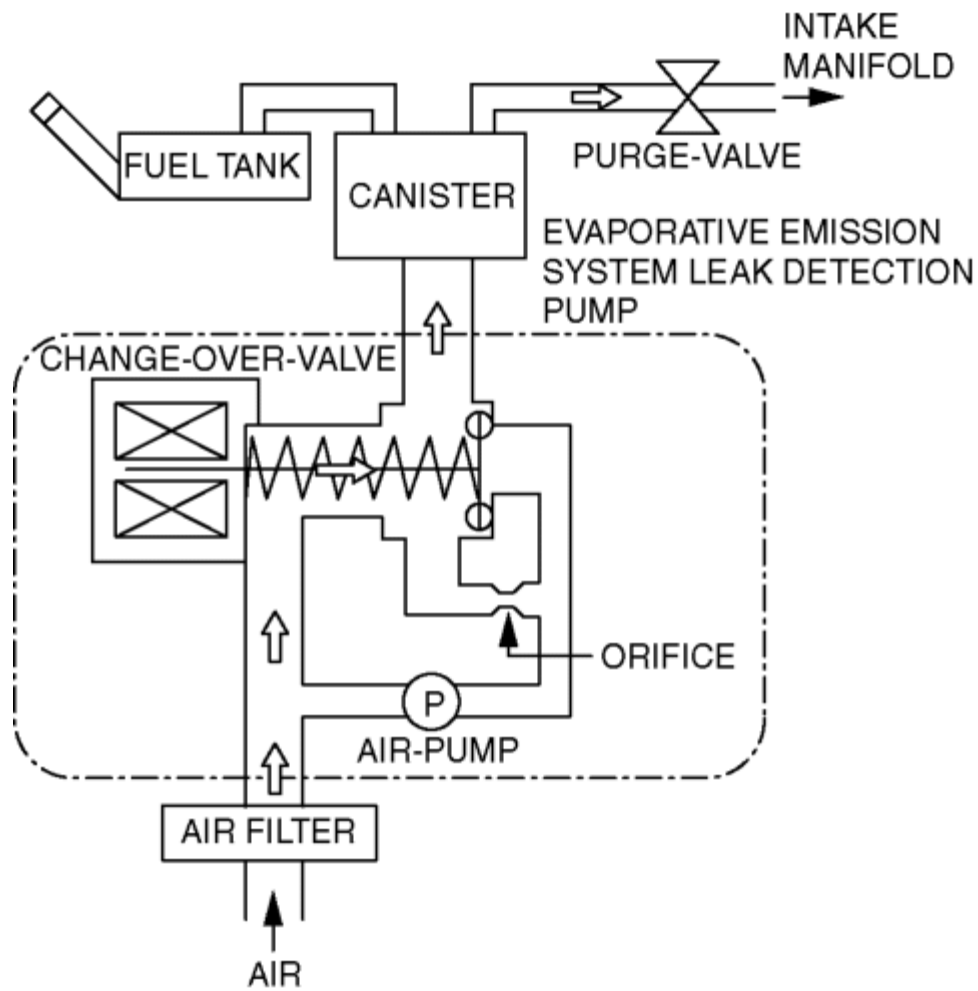
- The EVAP system test, which can substituted for the run drive cycle as an EVAP control system repair confirmation method, can be done while operating the M-MDS in the KOEO (Key On Engine Off) condition instead of actually driving the vehicle.

##### EVAP system test description

- The EVAP system test finds gas leaks in the system using the PCM to monitor changes in the air pump load current of the EVAP system leak detection pump. This test starts after sending an on-demand test signal from the M-MDS to the PCM. The PCM controls the air pump and change-over-valve operation and also stores the load current of the air pump as follows:
  - The PCM commands turn the air pump on and retrieve the air pump load current value (LDP\_MON PID) as a reference current (LDP\_REF PID).
  - After retrieving a reference current value, the PCM commands the change-over-valve to open, then captures the air pump load current value (LDP\_MON PID) as idle current (LDP\_IDL PID). The EVAP system will be pressurized from this phase.
  - The PCM continues to monitor the air pump load current value (LDP\_MON PID) until the end of the test.



- You can confirm whether any evaporative gas leak occurred or not by reading the test results.



### EVAP system malfunction judgment

- The PCM calculates the stored air pump load current value and send the results to the M-MDS as DTCs:

DTC No.	Condition
P0442	Evaporative emission control system leak detected (small leak)
P0446	Change over valve (COV) (EVP system leak detection pump) stuck close
P0455	Evaporative emission control system leak detected (gross leak)
P0456	Evaporative emission system leak detected (very small leak)
P2401	EVAP system leak detection pump motor circuit low
P2402	EVAP system leak detection pump motor circuit high
P2404	EVAP system leak detection pump sense circuit problem

P2405	EVAP system leak detection pump sense circuit low input
P2407	EVAP system leak detection pump sense circuit intermittent

**Evaporative system test procedure**

1. Select the EVAP system test from the Toolbox on the M-MDS display and follow the instructions.
2. Verify that all of the following PIDs are within the specifications at the pre-test confirmation screen.

**NOTE:**

- To successfully perform this procedure, all PIDs must be within the following specifications before proceeding to the next step.
- The PCM will cancel the EVAP system test if the VPWR PID value falls lower than **11.0 V** during the test.

**Specification**

PID	PID Range
BARO	72.2 kPa {543 mmHg, 21.3 inHg} or more
FLI	15—85%
IAT	5—45 °C {41—113 °F}
VPWR	11.0 V or more

3. Start the engine.
4. Drive the vehicle or let the engine idle more than **20 min**.
5. Turn ignition switch off, then turn it to the ON position again (Key On Engine Off).
6. Press the tick icon to start the test.
7. Verify that no DTCs present after the completion of the test.
  - If any test result is indicated with red, diagnose the problem using the following DTC troubleshooting procedure or component inspection procedure.
  - If any DTCs are detected, diagnose the problem using the appropriate DTC troubleshooting procedure.

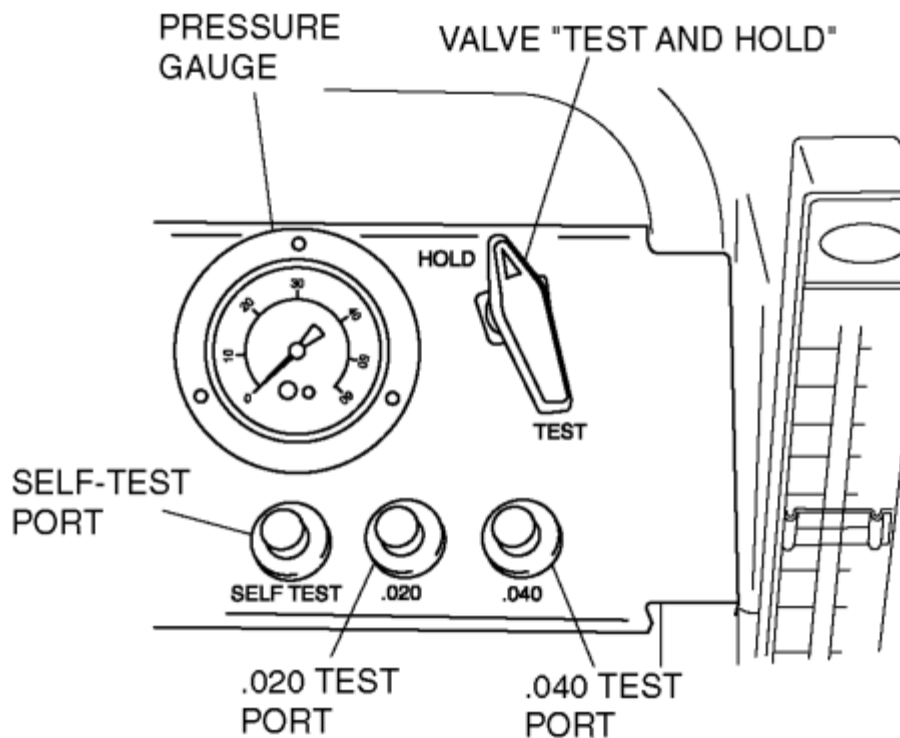
**EVAP system leak inspection using leak tester**

1. Perform the following **SST** (EVAP System Tester 134-01049) self-test:

**NOTE:**

- If the tester does not work correctly during the self-test, refer to the tester operators manual for a more detailed self-test procedure.

a. Verify that the control valve on the panel is in the HOLD position then open the nitrogen bottle valve.



b. Connect the vehicle interface hose (part of the **SST**) to the SELF-TEST port located on the control panel. Hand tighten the fitting. (Do not overtighten.)

c. Turn the control valve to the TEST position.

d. The gauge should read **331—381 mm { 13—15 in }** of water.

- If the gauge is not reading in this range, adjust the pressure by turning the black knob on the low pressure regulator at the nitrogen bottle.

e. Turn the control valve to the HOLD position.

f. Verify that the gauge holds pressure and that the flow meter reads no flow.

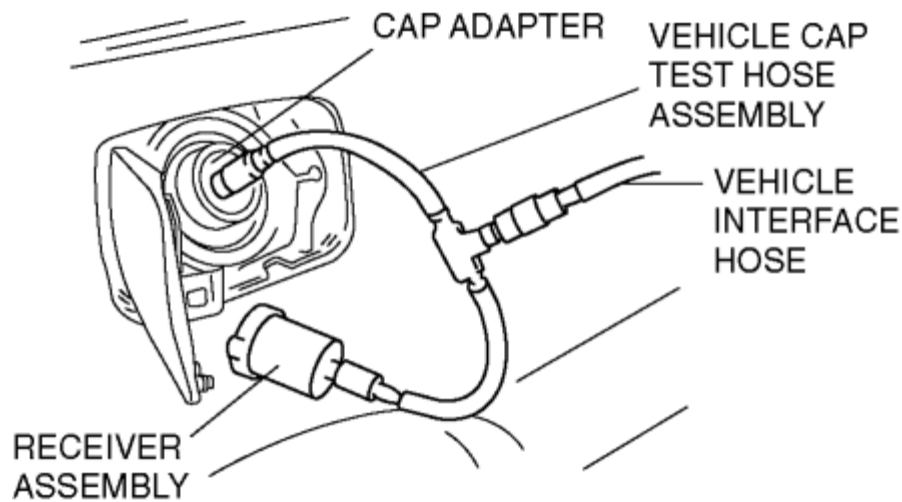
1. If there is no drop in pressure and no flow, the tester passes the self-test.
2. If the gauge leaks down, refer to the tester operators manual.

2. Connect the **SST** to the vehicle.

a. Verify that the control valve on the panel is in the HOLD position then open the nitrogen bottle valve.

b. Remove the fuel-filler cap from the vehicle.

- If the fuel-filler cap is not a MAZDA part or equivalent, replace it.
- c. Connect the receiver assembly (**SST**: AKS441130) to the vehicle cap test hose assembly (part of the **SST**) and the fuel-filler cap from the vehicle.



- d. Connect the cap adaptor (**SST**: AKS441131) to the vehicle cap test hose assembly (part of the **SST**) and to the fuel-filler neck.
- e. Connect the vehicle interface hose (part of the **SST**) to the center fitting of the vehicle cap test hose assembly (part of the **SST**).

3. Connect the M-MDS to the DLC-2.

4. Turn the ignition switch to the ON position (Engine off).

5. Request the PCM on-board device control (Mode 08) using the M-MDS to close the change-over valve (COV) in the EVAP system leak detection pump.

#### NOTE:

- The COV is closed for **10 min** unless the following any actions are done:
  - The engine is started.
  - The ignition switch is turned off position.

6. Make sure the control valve on the 134-01049 is in the HOLD position and that the valve on the cylinder of nitrogen gas is open.

7. Turn the control valve to the open position and let the system fill. You should note a drop in the gauge pressure along with the flow meter being pegged at maximum flow for several minutes depending on how full or empty the fuel tank is, and how long it takes to completely fill and pressurize the evaporative emissions system hoses.

8. If the gauge and the flow meter do not settle to a measurable level after **2—3 min**, then refer to the Mazda Workshop Manual to verify that the cut or vent valve is properly closed.

9. Verify the pressure gauge and flow meter reading to determine if there is an evaporative emissions leak:

#### NO EVAPORATIVE LEAK:

- The flow meter registers "zero flow" and the pressure gauge returns to the pre-set pressure of **356 mm { 14 in }** of water (H<sub>2</sub>O).



### EVAPORATIVE LEAK:

- The pressure does not return to the preset level of **356 mm {14 in}** of water (H<sub>2</sub>O) when measuring the flow. See "SETTING LEAK STANDARD FOR TESTING" (.020 to .040 inch H<sub>2</sub>O) of the Evaporative Emissions Tester operators manual (134-01067).

### NOTE:

1. Turn the control valve to the HOLD position then disconnect the **SST**.

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## 2008 - MX-5 - Engine

### NO.19 EXHAUST SMOKE [LF]

19	EXHAUST SMOKE
DESCRIPTION	Blue, black, or white smoke from exhaust system
POSSIBLE CAUSE	<p><b>Blue smoke (Burning oil):</b></p> <ul style="list-style-type: none"><li>• PCV valve malfunction</li><li>• Engine internal oil leakage</li></ul> <p><b>White smoke (Water in combustion):</b></p> <ul style="list-style-type: none"><li>• Cooling system malfunction (coolant loss)</li><li>• Engine internal coolant leakage</li></ul> <p><b>Black smoke (Rich fuel mixture):</b></p> <ul style="list-style-type: none"><li>• Air cleaner restriction</li><li>• Intake air system is collapsed or restricted.</li><li>• Fuel return line is restricted.</li><li>• Excessive fuel pressure</li><li>• Improper engine compression</li><li>• Injector fuel leakage</li><li>• Ignition system malfunction</li></ul> <p><b>WARNING:</b></p> <p>The following troubleshooting flow chart contains fuel system diagnosis and repair procedures. Read following warnings before servicing fuel system:</p> <ul style="list-style-type: none"><li>• Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.</li><li>• Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.</li></ul> <p>(See <b>BEFORE SERVICE PRECAUTION [LF]</b>.)</p>

(See **AFTER SERVICE PRECAUTION [LF]**.)

**CAUTION:**

- Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.

**Diagnostic procedure**

STEP	INSPECTION	RESULTS	ACTION
1	What color is smoke coming from the exhaust system?	Blue	Burning oil is indicated. Go to the next step.
		White	Water in combustion is indicated. Go to Step 3.
		Black	Rich fuel mixture is indicated. Go to Step 4.
2	Remove and shake the PCV valve.  Does the PCV valve rattle?	Yes	Inspect for the following: <ul style="list-style-type: none"><li>• Damaged valve guide, stems or valve seals</li><li>• Blocked oil drain passage in cylinder head</li><li>• Piston ring is not seated, seized or worn.</li><li>• Damaged cylinder bore</li></ul> If other driveability symptoms are present, return to diagnostic index to service any additional symptoms.
		No	Replace the PCV valve.
3	Does the cooling system hold pressure?	Yes	Inspect for the following: <ul style="list-style-type: none"><li>• Cylinder head gasket leakage</li><li>• Intake manifold gasket leakage</li><li>• Cracked or porous engine block</li></ul> If other driveability symptoms are present, return to diagnostic index to service any additional symptoms.

		No	Inspect for cause.
4	Inspect for the following: <ul style="list-style-type: none"> <li>• Air cleaner restriction</li> <li>• Collapsed or restricted intake air system</li> <li>• Restricted fuel return line</li> </ul> Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 4.
5	Connect the M-MDS to the DLC-2.  Turn the ignition switch to the ON position (Engine off).  Retrieve any DTCs.  Are there any DTCs displayed?	Yes	<b>DTC is displayed:</b>  Go to the appropriate DTC inspection.  (See <b>DTC TABLE [LF]</b> .)
		No	<b>No DTC is displayed:</b>  Go to the next step.
6	Install the fuel pressure gauge between the fuel pipe and the fuel distributor.  Start the engine and idle it.  Measure fuel line pressure during idle.  Is fuel line pressure correct during idle?  (See <b>FUEL LINE PRESSURE INSPECTION [LF]</b> .)	Yes	Go to the next step.
		No	<b>Low:</b> <ul style="list-style-type: none"> <li>• Inspect the fuel line for clogging.</li> <li>• If there is no malfunction, replace the fuel pump unit.  (See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF]</b>.)</li> </ul> <b>High:</b> <ul style="list-style-type: none"> <li>• Replace the fuel pump unit.  (See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF]</b>.)</li> </ul>
7	Perform the spark test.  (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b> .)  Is strong blue spark visible at each cylinder?	Yes	Inspect the CMP sensor.  (See <b>CAMSHAFT POSITION (CMP) SENSOR INSPECTION [LF]</b> .)
		No	Repair or replace the malfunctioning part according to spark test result.
8	<ul style="list-style-type: none"> <li>• Verify test results.               <ul style="list-style-type: none"> <li>▪ If normal, return to diagnostic index to service any additional</li> </ul> </li> </ul>		

symptoms.

(See [SYMPTOM DIAGNOSTIC INDEX \[LF\]](#).)

- If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.
  - If vehicle is repaired, troubleshooting completed.
  - If vehicle is not repaired or additional diagnostic information is not available, replace the PCM.

(See [PCM REMOVAL/INSTALLATION \[LF\]](#).)

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## 2008 - MX-5 - Engine

### NO.25 A/C DOES NOT CUT OFF UNDER WIDE OPEN THROTTLE CONDITIONS [LF]

25	A/C DOES NOT CUT OFF UNDER WOT CONDITIONS.
<b>DESCRIPTION</b>	A/C compressor magnetic clutch does not disengage under WOT.
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Accelerator pedal position sensor malfunction</li> <li>• Accelerator pedal position sensor misadjustment</li> <li>• Loosely installed accelerator pedal position sensor</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Does A/C compressor disengage when the A/C switch is turned off?	Yes	Go to the next step.
		No	Go to symptom troubleshooting "No.24 A/C is always on or A/C compressor runs continuously".
2	Connect the M-MDS to the DLC-2.  Turn the ignition switch to the ON position (Engine off).  Retrieve any DTCs.  Are there any DTCs displayed?	Yes	<b>DTC is displayed:</b>  Go to the appropriate DTC inspection. (See <a href="#">DTC TABLE [LF]</a> .)
		No	<b>No DTC is displayed:</b>  Inspect accelerator pedal position sensor.
3	<ul style="list-style-type: none"> <li>• Verify test results.               <ul style="list-style-type: none"> <li>▪ If normal, return to diagnostic index to service any additional symptoms.  (See <a href="#">SYMPTOM DIAGNOSTIC INDEX [LF]</a>.)</li> <li>▪ If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.                   <ul style="list-style-type: none"> <li>• If vehicle is repaired, troubleshooting completed.</li> </ul> </li> </ul> </li> </ul>		

- If vehicle is not repaired or additional diagnostic information is not available, replace the PCM.

(See [PCM REMOVAL/INSTALLATION \[LF\]](#).)

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### NO.12 LACK/LOSS OF POWER-ACCELERATION/CRUISE [LF]

12	LACK/LOSS OF POWER—ACCELERATION/CRUISE
<b>DESCRIPTION</b>	Performance is poor under load (such as power down when climbing hills).
	<ul style="list-style-type: none"><li>• Improper A/C system operation</li><li>• Erratic signal or no signal from CMP sensor</li><li>• Air leakage from intake-air system parts</li><li>• Restriction in intake-air system</li><li>• Intake air temperature too hot</li><li>• Improper variable intake air control operation</li><li>• Improper operation of electronic throttle control system</li><li>• Purge control solenoid malfunction</li><li>• Improper EGR valve operation</li><li>• Brake dragging</li><li>• Erratic signal from CKP sensor</li><li>• Low engine compression</li><li>• Vacuum leakage</li><li>• Poor fuel quality</li><li>• Erratic signal to ignition coil</li><li>• Engine overheating</li><li>• Throttle body malfunction</li><li>• Spark plug malfunction</li><li>• PCV valve malfunction</li><li>• Improper valve timing due to jumping out of timing belt</li><li>• Improper variable valve timing control operation</li><li>• Restriction in exhaust system</li></ul>



## POSSIBLE CAUSE

- Intermittent open or short in fuel pump related circuit
- Inadequate fuel pressure
- Fuel pump mechanical malfunction
- Fuel line restriction or clogging
- Fuel leakage from fuel injector
- Fuel injector clogging
- Erratic signal from accelerator pedal position sensor
- Erratic signal from TP sensor
- Intermittent open or short circuit in MAF sensor, Accelerator pedal position sensor, TP sensor, IAT sensor and VSS
- AT malfunction (AT)
- Clutch slippage (MT)

### WARNING:

The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:

- Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.
- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.

(See **BEFORE SERVICE PRECAUTION [LF].**)

(See **AFTER SERVICE PRECAUTION [LF].**)

### CAUTION:

- Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.

## Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Verify the following: <ul style="list-style-type: none"><li>• Vacuum connection</li><li>• Restriction in intake-air system (such as air cleaner element, fresh air duct)</li></ul>	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 1.

	<p>No air leakage from intake-air system</p> <ul style="list-style-type: none"><li>• No restriction of intake-air system</li><li>• Proper sealing of intake manifold and components attached to intake manifold; such as EGR valve</li><li>• Fuel quality (such as proper octane, contamination, winter/summer blend)</li></ul> <p>Are all items normal?</p>		
2	<p>Connect the M-MDS to the DLC-2.</p> <p>Turn the ignition switch to the ON position (Engine off).</p> <p>Retrieve any DTCs.</p> <p>Are there any DTCs displayed?</p>	Yes	<p><b>DTC is displayed:</b></p> <p>Go to the appropriate DTC inspection.</p> <p>(See <b>DTC TABLE [LF]</b>.)</p>
		No	<p><b>No DTC is displayed:</b></p> <p>Go to the next step.</p>
3	<p>Is the engine overheating?</p>	Yes	<p>Go to symptom troubleshooting "No.17 Cooling system concerns-Overheating".</p>
		No	<p>Go to the next step.</p>
4	<p>Connect the M-MDS to the DLC-2.</p> <p>Access APP1, APP2, RPM, MAF, TP, IAT and VSS PIDs.</p> <p>Drive vehicle while monitoring PIDs.</p> <p>Are PIDs within specifications?</p> <p>(See <b>PCM INSPECTION [LF]</b>.)</p>	Yes	<p>Go to the next step.</p>
		No	<p><b>APP1, APP2 PIDs:</b></p> <p>Inspect if output signal accelerator pedal position sensor changes smoothly.</p> <p><b>RPM PID:</b></p> <p>Inspect CKP sensor and related wiring harness for vibration or intermittent open/short circuit or both.</p> <p><b>MAF PID:</b></p> <p>Inspect for intermittent open circuit of MAF sensor and related wiring harness.</p> <p><b>TP PID:</b></p> <p>Inspect if output signal TP sensor changes smoothly.</p> <p><b>IAT PID:</b></p> <p>Inspect for air suction in intake-air</p>

			<p>system.</p> <p>If normal, inspect intermittent short circuit of IAT sensor and related wiring harnesses.</p> <p><b>VSS PID:</b></p> <p>Inspect for intermittent open circuit of VSS and related wiring harness.</p>
5	<p>Visually inspect the CKP sensor and teeth of crankshaft pulley.</p> <p>Are the CKP sensor and teeth of crankshaft pulley normal?</p>	Yes	Go to the next step.
		No	Replace the malfunctioning part.
6	<p>Inspect the spark plug condition.</p> <p>Is spark plug wet, covered with carbon or grayish white?</p>	Yes	<p><b>Spark plug is wet or covered with carbon:</b></p> <p>Inspect the fuel injector for fuel leakage.</p> <p>Inspect spark plug and high-tension lead.</p> <p><b>Spark plug is grayish white:</b></p> <p>Inspect the fuel injector for clogging.</p>
		No	<p>Install the spark plugs on original cylinders.</p> <p>Go to the next step.</p>
7	<p>Remove and shake the PCV valve.</p> <p>Does the PCV valve rattle?</p>	Yes	Go to the next step.
		No	Replace PCV valve.
8	<p>Perform electronic throttle control system operation inspection.</p> <p>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b>.)</p> <p>Does electronic throttle control system function properly?</p>	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part according to electronic throttle control system operation inspection results.
9	<p>visually inspect deformed exhaust system part.</p> <p>Is there any deformed exhaust system part?</p>	Yes	Replace the suspected part.
		No	Go to the next step.
10	<p>Install the fuel pressure gauge between the fuel pipe and the fuel distributor.</p> <p>Short check connector terminal F/P to body GND</p>	Yes	Go to the next step.
		No	<b>Zero or low:</b>

	<p>using a jumper wiring.</p> <p>Turn the ignition switch to the ON position.</p> <p>Is fuel line pressure correct with ignition switch to ON position?</p> <p>(See <b>FUEL LINE PRESSURE INSPECTION [LF].</b>)</p>		<p>Inspect the fuel pump relay and fuel pump circuit.</p> <p>Inspect the fuel line for clogging.</p> <p>If there is no malfunction, replace the fuel pump unit.</p> <p>(See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF].</b>)</p> <p><b>High:</b></p> <p>Replace the fuel pump unit.</p> <p>(See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF].</b>)</p>
11	<p>Inspect variable intake air control operation.</p> <p>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF].</b>)</p> <p>Does VIS function properly?</p>	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part.
12	<p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>The following test is for engine stalling with the A/C on concern. If other symptoms exist, go to the next step.</li> </ul> <p>Connect pressure gauge to the A/C low and high side pressure lines.</p> <p>Turn the A/C on and measure low side and high side pressures.</p> <p>Are pressures within specifications?</p> <p>(See <b>REFRIGERANT PRESSURE CHECK.</b>)</p>	Yes	Go to the next step.
		No	<p>If A/C is always on, go to symptom troubleshooting "No.24 A/C is always on or A/C compressor runs continuously".</p> <p>(See <b>NO.24 A/C IS ALWAYS ON/A/C COMPRESSOR RUNS CONTINUOUSLY [LF].</b>)</p> <p>For other symptoms, inspect the following:</p> <ul style="list-style-type: none"> <li>Refrigerant charging amount</li> <li>Condenser fan operation</li> </ul>
13	<p>Inspect for A/C cut off operation.</p> <p>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF].</b>)</p> <p>Does the A/C cut-off function properly?</p>	Yes	Go to the next step.
		No	Inspect A/C cut off system components.
14	<p>Disconnect the vacuum hose between the purge solenoid valve and the intake manifold from purge solenoid valve side.</p> <p>Plug opening end of vacuum hose.</p> <p>Drive the vehicle.</p>	Yes	<p>Inspect if purge solenoid valve is stuck open mechanically.</p> <p>Inspect the evaporative emission control system.</p> <p>(See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF].</b>)</p>

	Does the engine condition improve?	No	Go to the next step.
15	Visually inspect the CMP sensor and projections of camshaft pulley.	Yes	Go to the next step.
	Are the CMP sensor and projections of camshaft pulley normal?	No	Replace the malfunctioning part.
16	Inspect EGR system.  (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b> .)	Yes	Go to the next step.
	Is EGR system normal?	No	Replace the malfunctioning part according to EGR control system operation inspection results.
17	Inspect the variable valve timing control system operation.  (See <b>ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF]</b> .)	Yes	Go to the next step.
	Does the variable valve timing control system function properly?	No	Repair or replace the malfunctioning part according to variable valve timing control system inspection results.
18	Is the engine compression correct?	Yes	Inspect the following: <ul style="list-style-type: none"> <li>• Valve timing</li> <li>• Internal transaxle components (AT)</li> <li>• Clutch (MT)</li> <li>• Brake system for dragging</li> </ul>
		No	Inspect for cause.
19	<ul style="list-style-type: none"> <li>• Verify test results. <ul style="list-style-type: none"> <li>▪ If normal, return to diagnostic index to service any additional symptoms.  (See <b>SYMPTOM DIAGNOSTIC INDEX [LF]</b>.)</li> <li>▪ If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. <ul style="list-style-type: none"> <li>• If vehicle is repaired, troubleshooting completed.</li> <li>• If vehicle is not repaired or additional diagnostic information is not available, replace the PCM.  (See <b>PCM REMOVAL/INSTALLATION [LF]</b>.)</li> </ul> </li> </ul> </li> </ul>		



## 2008 - MX-5 - Engine

### NO.13 KNOCKING/PINGING-ACCELERATION/CRUISE [LF]

13	KNOCKING/PINGING - ACCELERATION/CRUISE
<b>DESCRIPTION</b>	Sound is heard when air/fuel mixture is ignited by something other than spark plug (such as hot spot in combustion chamber).
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Engine overheating due to cooling system malfunction</li> <li>• ECT sensor malfunction</li> <li>• IAT sensor malfunction</li> <li>• MAF sensor malfunction</li> <li>• Knock sensor malfunction</li> <li>• Erratic signal from CMP sensor</li> <li>• Inadequate engine compression</li> <li>• Inadequate fuel pressure</li> </ul> <p><b>WARNING:</b></p> <p>The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:</p> <ul style="list-style-type: none"> <li>• Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.</li> <li>• Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.</li> </ul> <p>(See <b>BEFORE SERVICE PRECAUTION [LF].</b>)</p> <p>(See <b>AFTER SERVICE PRECAUTION [LF].</b>)</p> <p><b>CAUTION:</b></p> <ul style="list-style-type: none"> <li>• Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.</li> </ul>

STEP	INSPECTION	RESULTS	ACTION
1	Connect the M-MDS to the DLC-2.  Access ECT PID.  Verify ECT PID is <b>less than 116°C {241°F}</b> during driving.  Is ECT PID less than specification?	Yes	Go to the next step.
		No	Inspect the cooling system for cause of overheating.
2	Connect the M-MDS to the DLC-2.  Access IAT and MAF PIDs.  Monitor each PID.  (See <b>PCM INSPECTION [LF]</b> .)  Are PIDs normal?	Yes	Go to the next step.
		No	<b>IAT PID:</b> Inspect IAT sensor <b>MAF PID:</b> Inspect MAF sensor
3	Connect the M-MDS to the DLC-2.  Turn the ignition switch to the ON position (engine off).  Are there any DTCs displayed?	Yes	<b>DTC is displayed:</b>  Go to the appropriate DTC inspection. (See <b>DTC TABLE [LF]</b> .)
		No	<b>No DTC is displayed:</b>  Go to the next step.
4	Is engine compression correct?	Yes	Go to the next step.
		No	Inspect for cause.
5	Install fuel pressure gauge between fuel pipe and fuel distributor.  Start the engine and idle it.  Measure fuel line pressure during idle.  Is fuel line pressure correct during idle? (See <b>FUEL LINE PRESSURE INSPECTION [LF]</b> .)	Yes	Inspect the ignition timing.
		No	<b>Low:</b>  Inspect the fuel pump relay and fuel pump circuit.  Inspect the fuel line for clogging.  If there is no malfunction, replace the fuel pump unit.  (See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF]</b> .)  <b>High:</b>  Replace the fuel pump unit.



			(See <b>FUEL PUMP UNIT REMOVAL/INSTALLATION [LF]</b> .)
6	Inspect the knock sensor.  Is the knock sensor normal?	Yes	Inspect ignition timing.
		No	Replace the knock sensor.
7	<ul style="list-style-type: none"> <li>• Verify test results. <ul style="list-style-type: none"> <li>▪ If normal, return to diagnostic index to service any additional symptoms.  (See <b>SYMPTOM DIAGNOSTIC INDEX [LF]</b>.)</li> <li>▪ If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. <ul style="list-style-type: none"> <li>• If vehicle is repaired, troubleshooting completed.</li> <li>• If vehicle is not repaired or additional diagnostic information is not available, replace the PCM.  (See <b>PCM REMOVAL/INSTALLATION [LF]</b>.)</li> </ul> </li> </ul> </li> </ul>		

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NO.28 FUEL FILLING SHUT OFF CONCERNS [LF]

28	FUEL FILLING SHUT OFF CONCERNS
DESCRIPTION	<ul style="list-style-type: none"><li>Fuel does not shut off properly.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Clogged EVAP pipes</li><li>Nonreturn valve malfunction</li><li>Fuel shut-off valve malfunction</li><li>Fuel nozzle malfunction</li><li>Fuel nozzle is not inserted correctly.</li></ul> <p><b>WARNING:</b></p> <ul style="list-style-type: none"><li>The following troubleshooting flow chart contains the fuel system diagnosis and repair procedures. Read the following warnings before servicing the fuel system:<ul style="list-style-type: none"><li>Fuel vapor is hazardous. It can easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.</li><li>Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete "BEFORE SERVICE PRECAUTION" and "AFTER SERVICE PRECAUTION" described in this manual.</li></ul><p>(See <b>BEFORE SERVICE PRECAUTION [LF]</b>.)</p><p>(See <b>AFTER SERVICE PRECAUTION [LF]</b>.)</p></li></ul> <p><b>CAUTION:</b></p> <ul style="list-style-type: none"><li>Disconnecting/connecting quick release connector without cleaning it may cause damage to fuel pipe and quick release connector. Always clean quick release connector joint area before disconnecting/connecting, and make sure that it is free of foreign material.</li></ul>

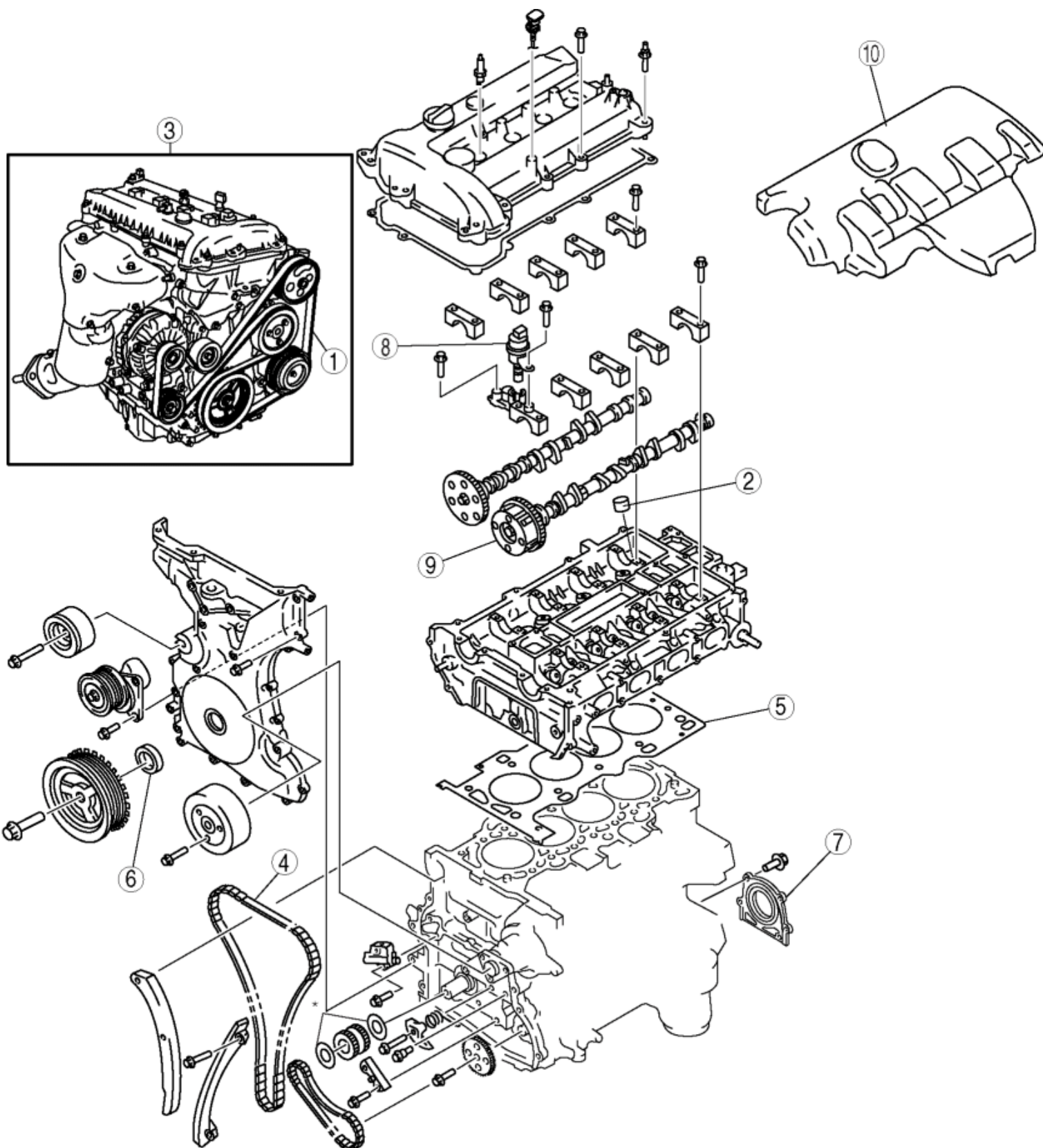
Diagnostic procedure

STEP	INSPECTION	ACTION
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1	<p>Connect the M-MDS to the DLC-2.</p> <p>Turn the ignition switch to the ON position (Engine off).</p> <p>Retrieve any DTCs.</p> <p>Are there any DTCs displayed?</p>	Yes	<p><b>DTC is displayed:</b></p> <p>Go to the appropriate DTC inspection.</p> <p>(See <a href="#">DTC TABLE [LF]</a>.)</p>
		No	<p><b>No DTC is displayed:</b></p> <p>Go to the next step.</p>
2	<p>Remove the fuel-filler pipe.</p> <p>Make sure the nonreturn valve is installed properly.</p> <p>Inspect nonreturn valve operation.</p> <p>Is the nonreturn valve normal?</p>	Yes	<p>Inspect for the following:</p> <ul style="list-style-type: none"> <li>• Improper use of fuel nozzle</li> <li>• Fuel is not inserted correctly.</li> <li>• Inspect fuel shut-off valve.</li> </ul>
		No	<p><b>Nonreturn valve is installed improperly:</b></p> <ul style="list-style-type: none"> <li>• Reinstall the nonreturn valve to proper position.</li> </ul> <p><b>Nonreturn valve does not operate properly:</b></p> <ul style="list-style-type: none"> <li>• Replace the nonreturn valve.</li> </ul>
3	<ul style="list-style-type: none"> <li>• Verify test results. <ul style="list-style-type: none"> <li>▪ If normal, return to diagnostic index to service any additional symptoms.</li> </ul> <p>(See <a href="#">SYMPTOM DIAGNOSTIC INDEX [LF]</a>.)</p> <li>▪ If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. <ul style="list-style-type: none"> <li>• If vehicle is repaired, troubleshooting completed.</li> <li>• If vehicle is not repaired or additional diagnostic information is not available, replace the PCM.</li> </ul> <p>(See <a href="#">PCM REMOVAL/INSTALLATION [LF]</a>.)</p> </li> </li></ul>		

2008 - MX-5 - Engine

ENGINE LOCATION INDEX [LF]



\*:IF EQUIPPED

1	Drive belt
---	------------

	(See <a href="#">DRIVE BELT INSPECTION [LF].</a> ) (See <a href="#">DRIVE BELT REPLACEMENT [LF].</a> ) (See <a href="#">DRIVE BELT AUTO TENSIONER INSPECTION [LF].</a> )
2 Tappet	(See <a href="#">VALVE CLEARANCE INSPECTION [LF].</a> )
3 Engine	(See <a href="#">COMPRESSION INSPECTION [LF].</a> ) (See <a href="#">ENGINE REMOVAL/INSTALLATION [LF].</a> ) (See <a href="#">ENGINE DISASSEMBLY/ASSEMBLY [LF].</a> )
4 Timing Chain	(See <a href="#">TIMING CHAIN REMOVAL/INSTALLATION [LF].</a> )
5 Cylinder head gasket	(See <a href="#">CYLINDER HEAD GASKET REPLACEMENT [LF].</a> )
6 Front oil seal	(See <a href="#">FRONT OIL SEAL REPLACEMENT [LF].</a> )
7 Rear oil seal	(See <a href="#">REAR OIL SEAL REPLACEMENT [LF].</a> )
8 OCV	(See <a href="#">OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION [LF].</a> ) (See <a href="#">OIL CONTROL VALVE (OCV) INSPECTION [LF].</a> )
9 Variable valve timing actuator	(See <a href="#">VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION [LF].</a> ) (See <a href="#">VARIABLE VALVE TIMING ACTUATOR INSPECTION [LF].</a> )
10 Plug hole plate	(See <a href="#">PLUG HOLE PLATE REMOVAL/INSTALLATION [LF].</a> )

## 2008 - MX-5 - Engine

### COMPRESSION INSPECTION [LF]

#### WARNING:

- Hot engines and oil can cause severe burns. Be careful not to burn yourself during removal/installation of each component.

1. Verify that the battery is fully charged.

- Recharge it if necessary. (See [BATTERY INSPECTION \[LF\]](#).)

2. Warm up the engine to the normal operating temperature.

3. Perform "Fuel Line Safety Procedures". Leave the fuel pump relay removed. (See [BEFORE SERVICE PRECAUTION \[LF\]](#).)

#### WARNING:

- Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.
- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure". (See [BEFORE SERVICE PRECAUTION \[LF\]](#).)

4. Remove the fuel pump relay.

5. Remove the front suspension tower bar (joint). (See [FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION](#).)

6. Remove the ignition coils. (See [IGNITION COIL REMOVAL/INSTALLATION \[LF\]](#).)

7. Remove the spark plugs. (See [SPARK PLUG REMOVAL/INSTALLATION \[LF\]](#).)

8. Connect a compression gauge into the spark plug hole.

9. Fully depress the accelerator pedal and crank the engine.

10. Note the maximum gauge reading.

11. Inspect each cylinder as above.

- If the measured value is less than the limited value, or there is a cylinder whose compression value varies from that of other cylinders by **196.1 kPa {2.0 kgf/cm<sup>2</sup>, 28.5 psi}** or more, add a small amount of engine oil through the spark plug hole. Then measure the compression pressure and perform the respective operations for the following cases.
  - If the compression increases, the piston, the piston rings, or cylinder wall may be worn and overhaul is required.
  - If the compression stays low, a valve may be stuck or

improperly seated and overhaul is required.

- If the compression in adjacent cylinders stays low, the cylinder head gasket may be damaged or the cylinder head distorted and overhaul is required.

### **Compression**

- Standard: 1,720 kPa {17.5391 kgf/cm<sup>2</sup>, 249.465 psi} [300 rpm]
- Minimum: 1,204 kPa {12.277 kgf/cm<sup>2</sup>, 174.58 psi} [300 rpm]
- Maximum difference between cylinders: 196.1 kPa {2.0 kgf/cm<sup>2</sup>, 28.5 psi}

12. Disconnect the compression gauge.

13. Install the spark plugs. (See [SPARK PLUG REMOVAL/INSTALLATION \[LF\]](#).)

14. Install the ignition coils. (See [IGNITION COIL REMOVAL/INSTALLATION \[LF\]](#).)

15. Install the front suspension tower bar (joint). (See [FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION](#).)

16. Install the fuel pump relay.

17. Complete the "AFTER SERVICE PRECAUTION". (See [AFTER SERVICE PRECAUTION \[LF\]](#).)

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## 2008 - MX-5 - Engine

### ENGINE REMOVAL/INSTALLATION [LF]

#### WARNING:

- Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure", while referring to the "BEFORE SERVICE PRECAUTION".

#### NOTE:

- Remove the engine, transmission, and crossmember component as a single unit from under the vehicle.
- Perform "Fuel Line Safety Procedures". Leave the fuel pump relay removed. (See [BEFORE SERVICE PRECAUTION \[LF\]](#).)
  - Drain the engine coolant. (See [ENGINE COOLANT REPLACEMENT \[LF\]](#).)
  - Remove the following parts:
    - The front wheel and tires (See [GENERAL PROCEDURES \(SUSPENSION\)](#).)
    - The plug hole plate (See [PLUG HOLE PLATE REMOVAL/INSTALLATION \[LF\]](#).)
    - The battery cover, battery, battery box, battery tray and battery duct (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
    - The air cleaner (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
    - The throttle body (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
    - The PCM, PCM duct and air cleaner insulator (See [PCM REMOVAL/INSTALLATION \[LF\]](#).)
    - The coolant reserve tank (See [COOLANT RESERVE TANK REMOVAL/INSTALLATION \[LF\]](#).)
    - The console (See [CONSOLE REMOVAL/INSTALLATION](#).)
  - Disconnect the P/S oil pump hoses and drain the P/S fluid reservoir. (See [POWER STEERING OIL PUMP REMOVAL/INSTALLATION](#).)
  - Remove the splash shield, under cover and mud guards.
  - Remove the generator duct. (See [GENERATOR REMOVAL/INSTALLATION \[LF\]](#).)
  - Drain the transmission oil (MT) or ATF (AT). (See [TRANSMISSION OIL REPLACEMENT \[M15M-D\]](#).) (See [TRANSMISSION OIL REPLACEMENT \[P66M-D\]](#).) (See [AUTOMATIC TRANSMISSION FLUID \(ATF\) REPLACEMENT \[SJ6A-EL\]](#).)
  - Disconnect the brake vacuum hose.
  - Disconnect the quick release connector from the dynamic chamber. (See [QUICK RELEASE CONNECTOR \(EMISSION SYSTEM\) REMOVAL/INSTALLATION \[LF\]](#).)
  - Disconnect the quick release connector from the fuel distributor. (See [BEFORE SERVICE PRECAUTION \[LF\]](#).) (See [QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION \[LF\]](#).)
  - Remove the drive belt. (See [DRIVE BELT REPLACEMENT \[LF\]](#).)
  - Remove the A/C compressor with the pipes connected and secure the A/C compressor using wire or rope so that it is out of the way.
  - Disconnect the water hose and heater hose.
  - Secure the caliper (front) using wire or rope so that it is out of the way.
  - Disconnect the wiring harness.
  - Disconnect front ABS wheel-speed sensor connector. (See [FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION](#).)
  - Remove the radiator. (See [RADIATOR REMOVAL/INSTALLATION \[LF\]](#).)
  - AT
    - Disconnect the manual shaft lever component. (See [AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION \[SJ6A-EL\]](#).)
- MT
- Remove the clutch release cylinder with the pipes connected and secure the clutch release cylinder using wire or rope so that it is out of the way. (See [CLUTCH RELEASE CYLINDER REMOVAL/INSTALLATION](#).)
  - Remove the shift lever knob. (See [TRANSMISSION REMOVAL/INSTALLATION \[M15M-D\]](#).)

19. Remove the engine, transmission, and crossmember component using an engine lifter in the order indicated in the table.

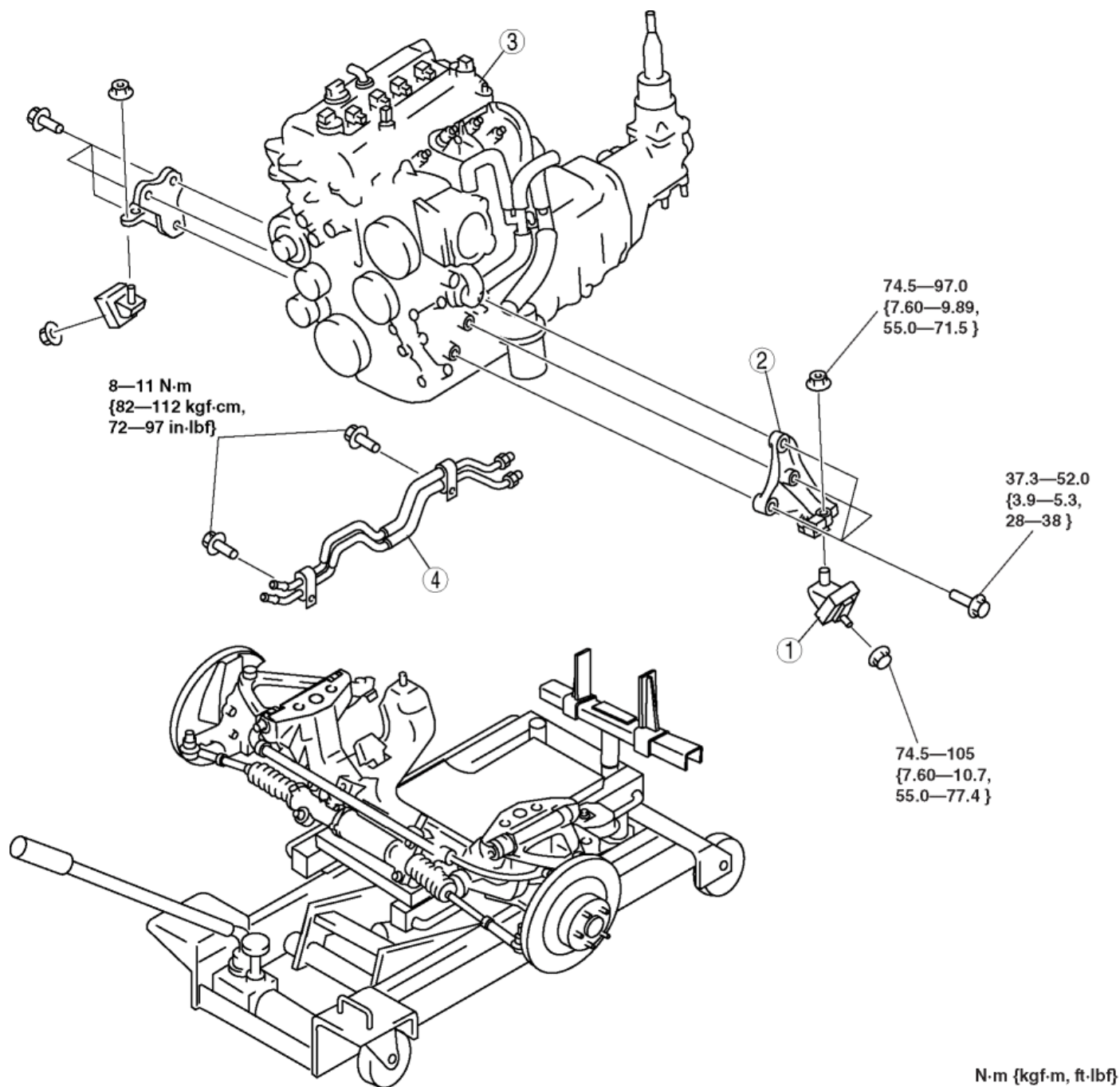
**WARNING:**

- Remove the engine, transmission and crossmember carefully, holding it steady. If the transmission falls it could be damaged or cause injury.



1	Tunnel member
2	Member bracket
3	Transverse member
4	Middle pipe (See <a href="#">EXHAUST SYSTEM REMOVAL/INSTALLATION [LF].</a> )
5	Power plant frame (See <a href="#">AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL].</a> ) (See <a href="#">AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL].</a> ) (See <a href="#">TRANSMISSION REMOVAL/INSTALLATION [P66M-DJ].</a> ) (See <a href="#">TRANSMISSION REMOVAL/INSTALLATION [P66M-DJ].</a> ) (See <a href="#">AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL].</a> ) (See <a href="#">AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL].</a> )
6	Propeller shaft (See <a href="#">PROPELLER SHAFT REMOVAL/INSTALLATION.</a> )
7	Bolt (Intermediate Shaft) (See <a href="#">STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION.</a> ) (See <a href="#">STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION.</a> )
8	Engine, transmission, crossmember component (See <a href="#">ENGINE REMOVAL/INSTALLATION [LF].</a> )

20. Remove the engine and transmission from the crossmember component lifter in the order indicated in the table by suspending them with a crane.



1	Engine mount rubber
2	Engine mount bracket
3	Engine, transmission
4	Oil pipe, oil hose
(See <a href="#">OIL COOLER REMOVAL/INSTALLATION [SJ6A-EL]</a> .)	

21. Install in the reverse order of removal.

22. Start the engine and inspect and adjust the following:

- Pulley and belt for runout, tension, and contact
- Leakage of engine oil, engine coolant, ATF, MT oil, and fuel

- Ignition timing, idle speed, and idle mixture (CO and HC) (See [ENGINE TUNE-UP \[LF\].](#))
- Front wheel alignment (See [FRONT WHEEL ALIGNMENT.](#))
- Engine-driven accessories operation

23. Perform the on-road test and verify that there is no vibration or noise.

### **Engine, Transmission, Crossmember Component Removal Note**

1. Secure the engine, transmission, and crossmember component using an engine lifter.

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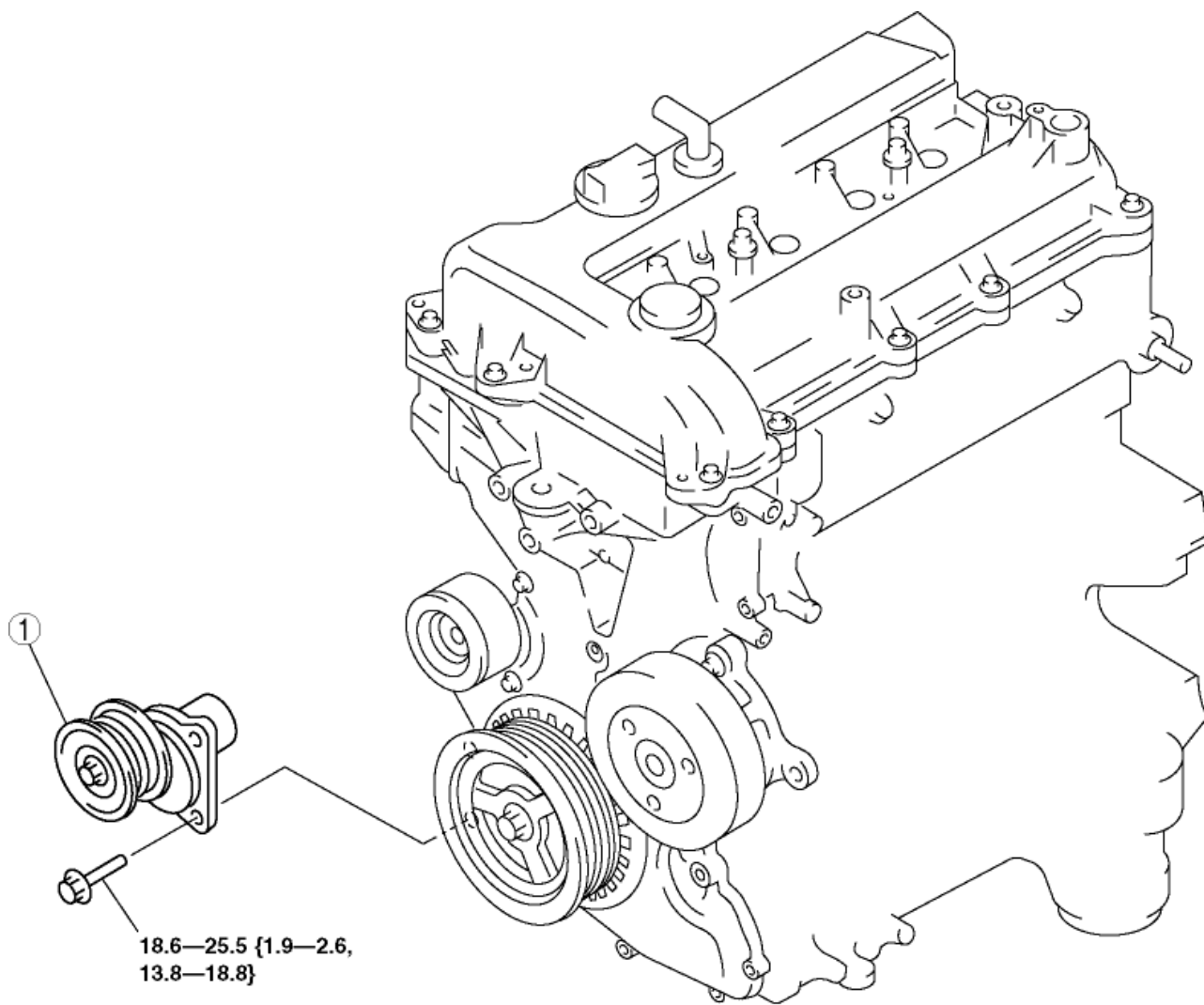
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## 2008 - MX-5 - Engine

### ENGINE DISASSEMBLY/ASSEMBLY [LF]

1. Remove the transmission from the engine. (See [TRANSMISSION REMOVAL/INSTALLATION \[M15M-D\]](#).) (See [TRANSMISSION REMOVAL/INSTALLATION \[P66M-D\]](#).) (See [AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION \[SJ6A-EL\]](#).)
2. Remove the following parts:
  - a. The clutch unit (MT) (See [CLUTCH UNIT REMOVAL/INSTALLATION](#).)
  - b. The ignition coil (See [IGNITION COIL REMOVAL/INSTALLATION \[LF\]](#).)
  - c. The CMP sensor (See [CAMSHAFT POSITION \(CMP\) SENSOR REMOVAL/INSTALLATION \[LF\]](#).)
  - d. The power steering oil pump (See [POWER STEERING OIL PUMP REMOVAL/INSTALLATION](#).)
  - e. The fuel distributor and fuel injector (See [FUEL INJECTOR REMOVAL/INSTALLATION \[LF\]](#).)
  - f. The intake-air system (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
  - g. The exhaust system (See [EXHAUST SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
  - h. The CKP sensor (See [CRANKSHAFT POSITION \(CKP\) SENSOR REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.



N·m {kgf·m, ft·lbf}

1 Drive belt auto tensioner

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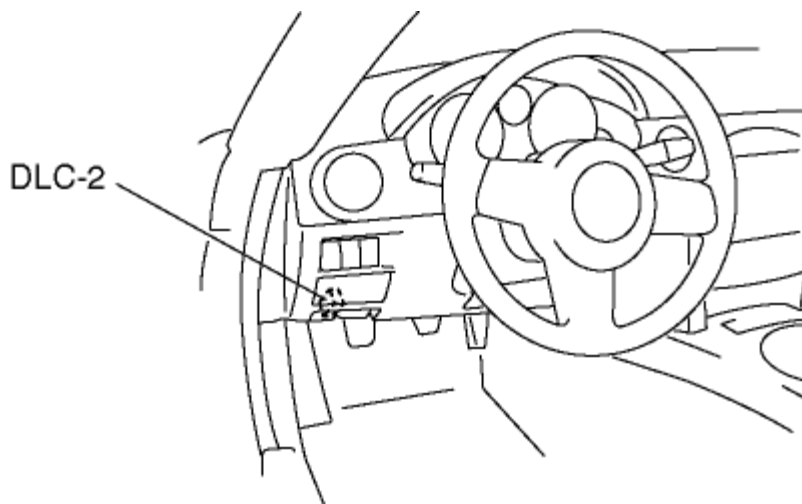


## 2008 - MX-5 - Engine

### ENGINE TUNE-UP [LF]

#### Engine Tune-up Preparation

1. Verify the following:
  - AT: Selector lever is in P or N position.
  - MT: Shift lever is in neutral position.
2. Verify that no DTCs are available.
3. Warm up the engine (ECT is **approx. 80 °C {176 °F} or more**) as follows.
  - a. Start the engine.
  - b. Racing at the engine speed **2,500—3,000 rpm** for 3 min.
4. Turn off the electrical loads.
5. Wait until the cooling fans stop.
6. Connect the **SST** (M-MDS) to the DLC 2.



7. Verify that the idling speed (M-MDS: RPM PID) is within the specification using the M-MDS function.

#### Standard

- AT: 700—800 rpm
- MT: 670—770 rpm

## Ignition Timing Inspection

### NOTE:

- Ignition timing is not adjustable.
- Ignition timing verification requires M-MDS.

1. Verify that the ignition timing (M-MDS: SPARKADV PID) is within the specification using M-MDS.

#### Ignition timing

- Approx. BTDC 8 °

2. Verify that ignition timing advances when the engine speed increases gradually.

- If there is malfunction, refer to "ENGINE SYMPTOM TROUBLESHOOTING". (See [SYMPTOM DIAGNOSTIC INDEX \[LF\]](#).)

## Idle Speed Inspection

### NOTE:

- Idle speed is not adjustable.
- Idle speed verification requires M-MDS.

1. Verify that the idle speed (M-MDS: RPM PID) is within the specification using M-MDS.

- If there is malfunction, refer to "ENGINE SYMPTOM TROUBLESHOOTING". (See [SYMPTOM DIAGNOSTIC INDEX \[LF\]](#).)

#### Idle speed

- No load: 670—770 rpm (MT), 700—800 rpm (AT)
- Electrical loads (38—48 A): 700—800 rpm
- Electrical loads (more than 48 A): 800—900 rpm
- P/S ON: 700—800 rpm (MT), 750—850 rpm (AT)
- A/C ON: 825—925 rpm (MT), 775—875 rpm (AT)

## Idle Mixture Inspection

1. Verify that the idle speed and ignition timing are within the specification. (See [ENGINE TUNE-UP \[LF\]](#).) (See [ENGINE TUNE-UP \[LF\]](#).)

2. Insert an exhaust gas analyzer to the tailpipe.

3. Verify that the CO and HC concentrations are within the regulation.

- If there is malfunction, refer to "ENGINE SYMPTOM TROUBLESHOOTING". (See [SYMPTOM DIAGNOSTIC INDEX \[LF\]](#).)

#### Idle mixture

- HC concentration: Within the regulation
- CO concentration: Within the regulation

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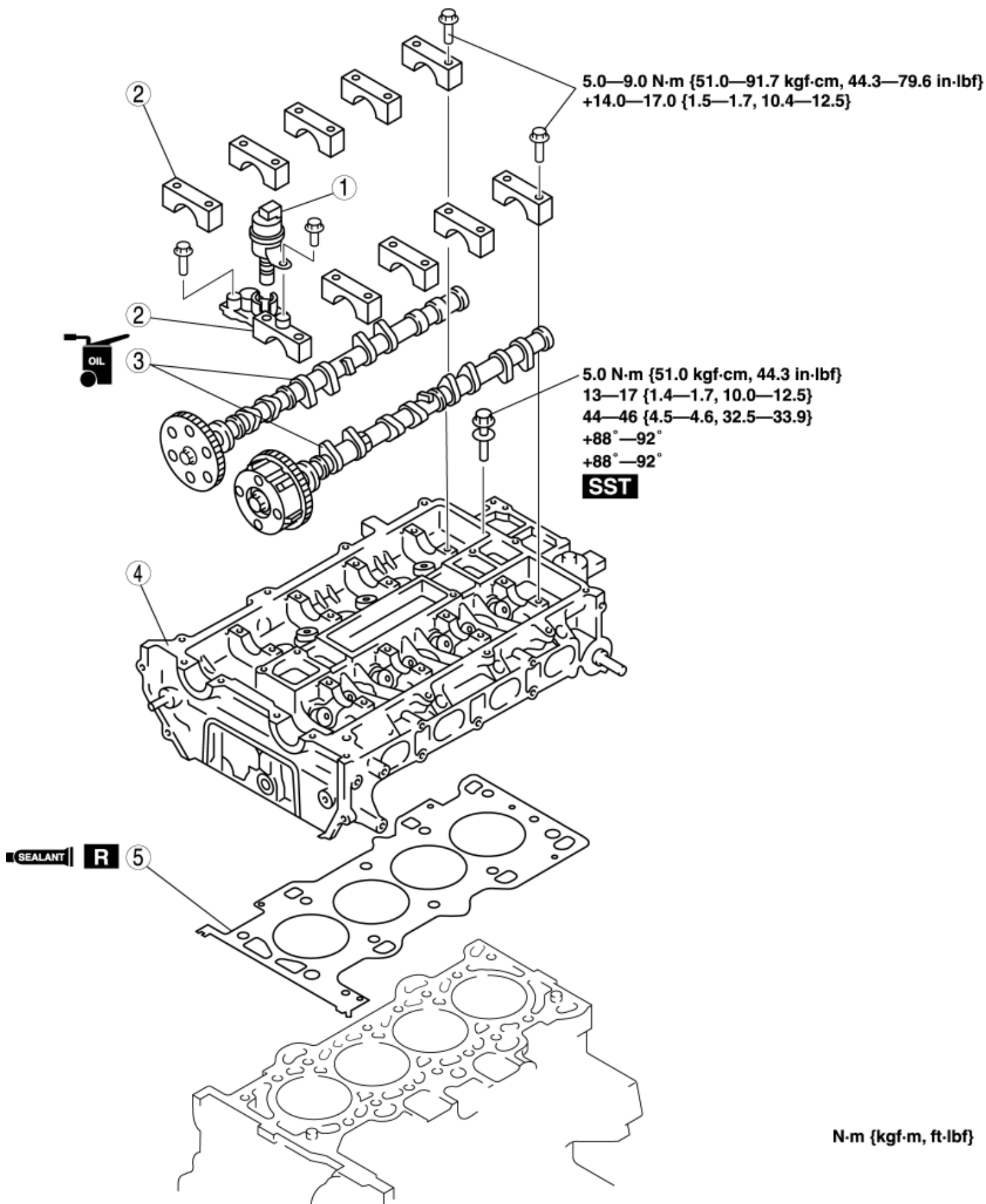
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## 2008 - MX-5 - Engine

### CYLINDER HEAD GASKET REPLACEMENT [LF]

#### WARNING:

- Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.
  - Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure". (See **BEFORE SERVICE PRECAUTION [LF]**.)
1. Perform "Fuel Line Safety Procedures". Leave the fuel pump relay removed. (See **BEFORE SERVICE PRECAUTION [LF]**.)
  2. Remove the battery and battery tray. (See **BATTERY REMOVAL/INSTALLATION [LF]**.)
  3. Drain the engine coolant. (See **ENGINE COOLANT REPLACEMENT [LF]**.)
  4. Remove the front suspension tower bar (joint, right side, left side). (See **FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION**.)
  5. Remove the air cleaner. (See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [LF]**.)
  6. Remove the dynamic chamber. (See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [LF]**.)
  7. Remove the ignition coil. (See **IGNITION COIL REMOVAL/INSTALLATION [LF]**.)
  8. Remove the drive belt. (See **TIMING CHAIN REMOVAL/INSTALLATION [LF]**.)
  9. Remove the CKP sensor. (See **CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION [LF]**.)
  10. Remove the P/S oil pump with the oil hose still connected and position the P/S oil pump so that it is out of the way. (See **POWER STEERING OIL PUMP REMOVAL/INSTALLATION**.)
  11. Remove the timing chain. (See **TIMING CHAIN REMOVAL/INSTALLATION [LF]**.)
  12. Remove the wiper arm. (See **WIPER ARM AND BLADE REMOVAL/INSTALLATION**.)
  13. Remove the cowl grille. (See **COWL GRILLE REMOVAL/INSTALLATION**.)
  14. Remove the side cowl grille. (See **SIDE COWL GRILLE REMOVAL/INSTALLATION**.)
  15. Remove the service hole cover. (See **EGR VALVE REMOVAL/INSTALLATION [LF]**.)
  16. Disconnect the generator, but do not remove it from the vehicle. Fix the generator using a rope to prevent it from falling. (See **GENERATOR REMOVAL/INSTALLATION [LF]**.)
  17. Remove the exhaust manifold. (See **EXHAUST SYSTEM REMOVAL/INSTALLATION [LF]**.)
  18. Remove in the order indicated in the table.
  19. Install in the reverse order of removal.
  20. Inspect the compression. (See **COMPRESSION INSPECTION [LF]**.)
  21. Start the engine and:
    - Inspect for the engine coolant leakage.
    - Verify the ignition timing, idle speed and idle mixture. (See **ENGINE TUNE-UP [LF]**.)



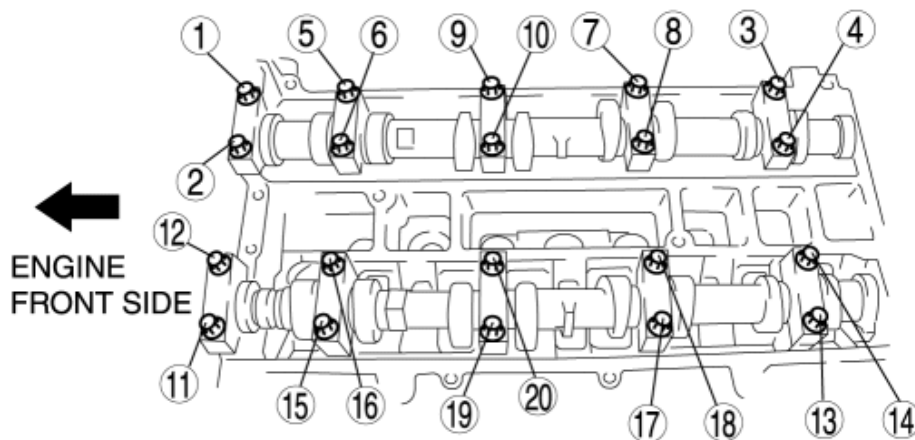
1	OCV (With variable valve timing mechanism.)
2	Camshaft cap
3	Camshaft (See <a href="#">Camshaft Removal Note.</a> ) (See <a href="#">Camshaft Installation Note.</a> )
4	Cylinder head (See <a href="#">Cylinder Head Removal Note.</a> ) (See <a href="#">Cylinder Head Installation Note.</a> )
5	Cylinder head gasket (See <a href="#">Cylinder Head Gasket Installation Note.</a> )

## Camshaft Removal Note

### NOTE:

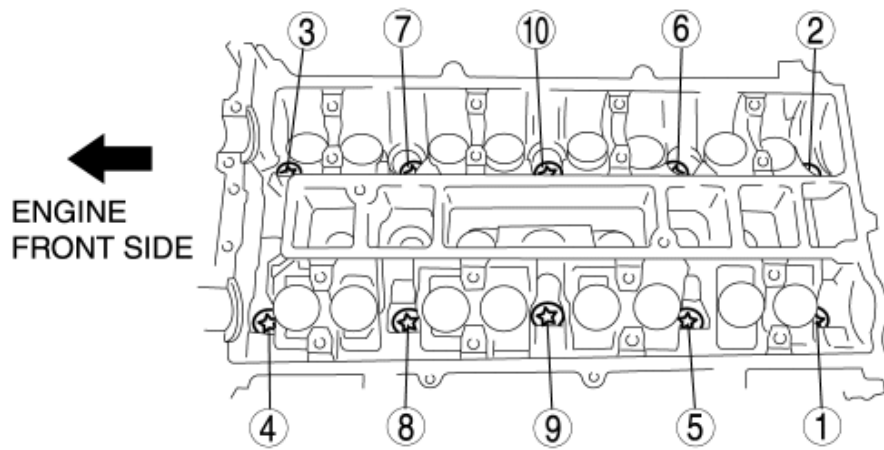
- The cylinder head and the camshaft caps are numbered to make sure they are reassembled in their original position. Do not mix the caps.

- Loosen the camshaft cap bolts in several passes in the order shown.



## Cylinder Head Removal Note

- Loosen the cylinder head bolts in two or three steps in the order shown.

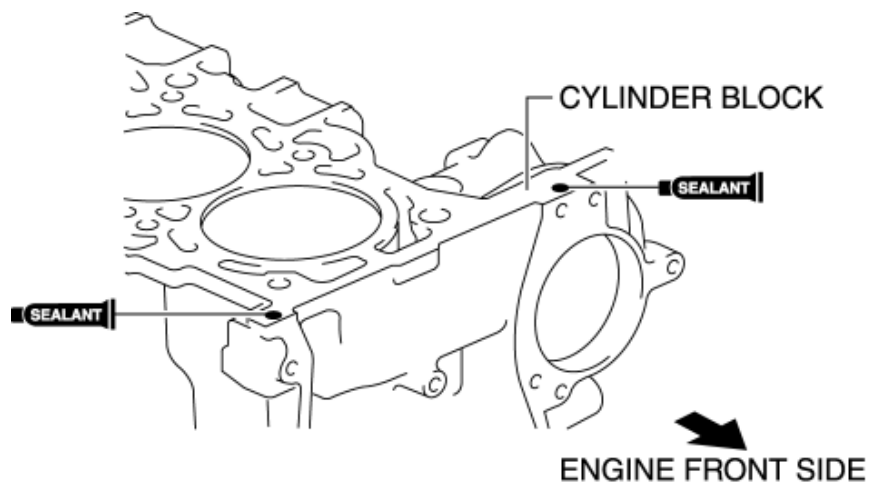


### Cylinder Head Gasket Installation Note

1. Apply silicone sealant to the areas shown in the figure.

#### CAUTION:

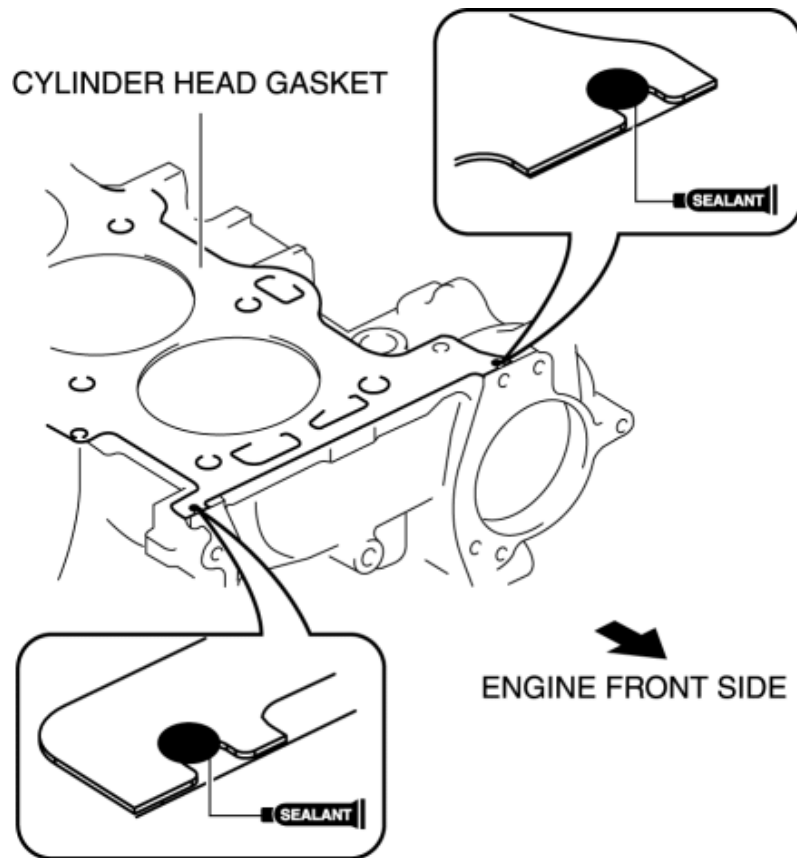
- Install the cylinder head gasket and cylinder head before the applied silicone sealant starts to harden.



#### Thickness

- 4—7 mm {0.16—0.27 in}

2. Install the cylinder block with a new cylinder head gasket.
3. Apply silicone sealant to the areas shown in the figure.



#### Thickness

- 4—7 mm {0.16—0.27 in}

4. Install the cylinder head referring to the Cylinder Head Installation Note.

### Cylinder Head Installation Note

1. Measure the length of each cylinder head bolt.

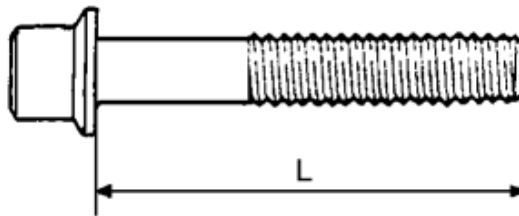
- Replace any that exceed the maximum length.

#### Cylinder Head Bolt Length L

- 145.2—145.8 mm {5.72—5.74 in}

#### Cylinder Head Bolt Maximum

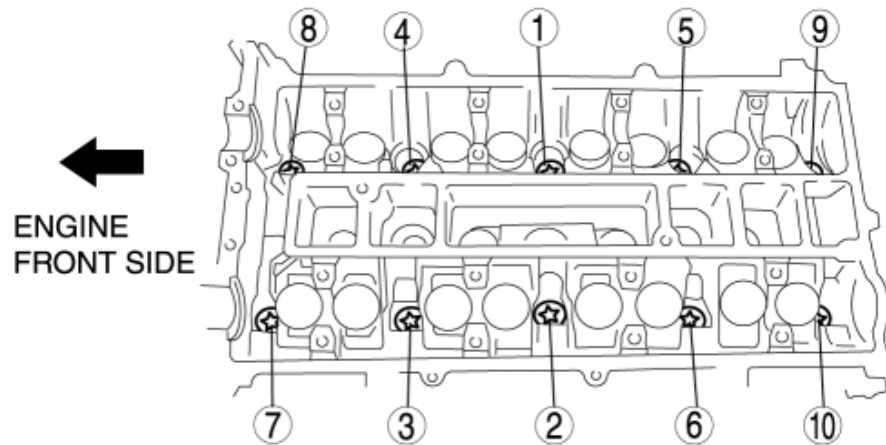
- 146.5 mm {5.77 in}



2. Tighten the cylinder head bolts in the order shown with the following 5 steps using the **SST (49 D032 316)**.

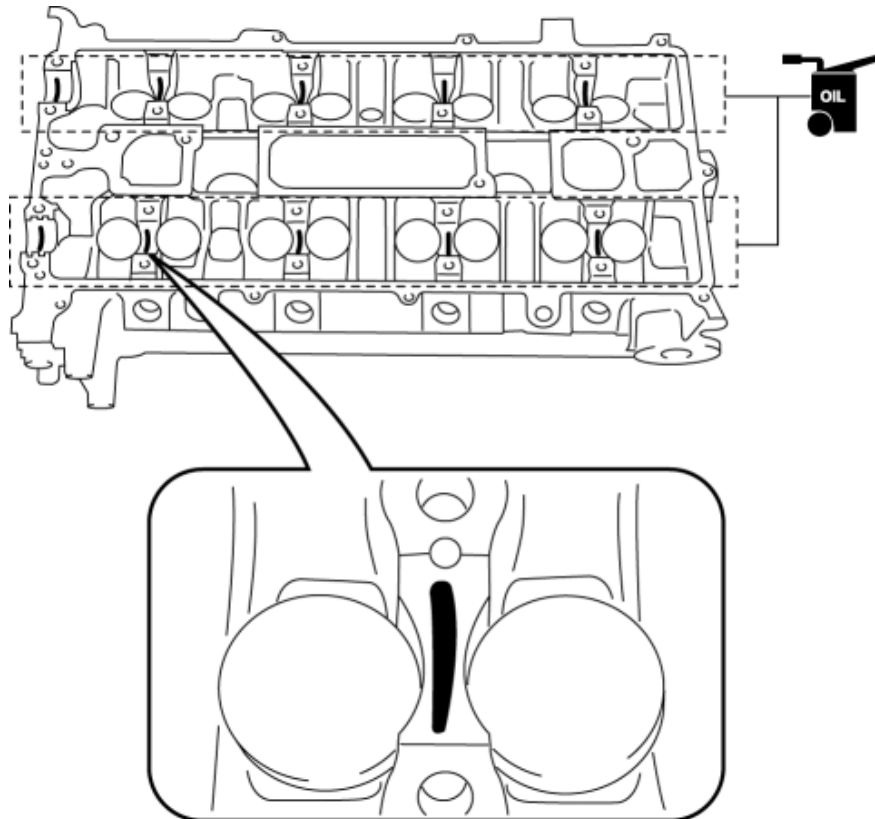


- a. Tighten to **5.0 N·m {51.0 kgf·cm, 44.3 in·lbf}**
- b. Tighten **13—17 N·m {1.4—1.7 kgf·m, 10.0—12.5 ft·lbf}**
- c. Tighten **44—46 N·m {4.5—4.6 kgf·m, 32.5—33.9 ft·lbf}**
- d. Tighten **88°—92°**
- e. Tighten **88°—92°**

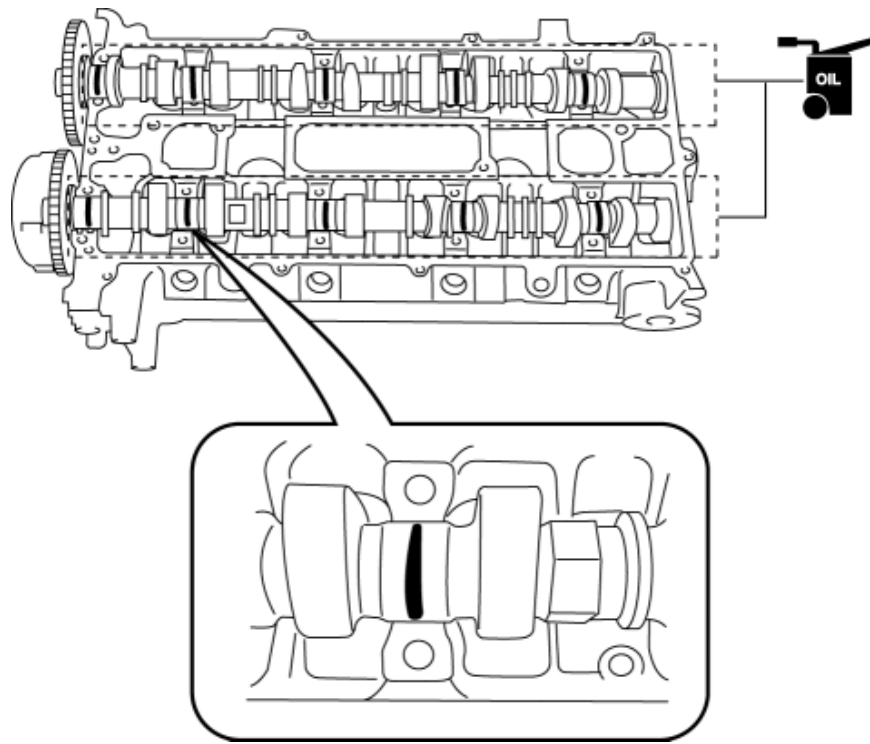


#### Camshaft Installation Note

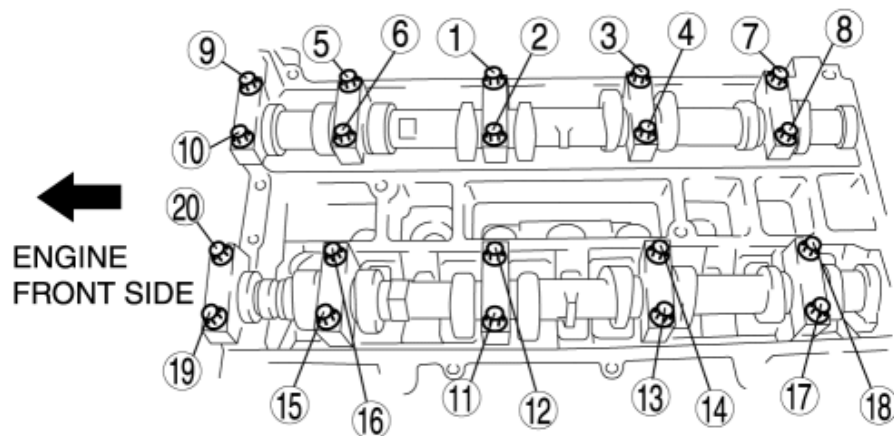
1. Apply the gear oil (SAE No.90 or equivalent) to each journal of the cylinder head as shown in the figure.



2. Set the cam position of No.1 cylinder at the top dead center (TDC) and install the camshaft.
3. Apply the gear oil (SAE No.90 or equivalent) to each journal of the camshaft as shown in the figure.



4. Temporarily tighten the camshaft bearing caps evenly in two or three steps.
5. Tighten the camshaft cap bolts in the order shown with the following two steps.
  - a. Tighten to **5.0—9.0 N·m { 51.0—91.7 kgf·cm, 44.3—79.6 in·lbf }**
  - b. Tighten to **14.0—17.0 N·m { 1.5—1.7 kgf·m, 10.4—12.5 ft·lbf }**



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## 2008 - MX-5 - Engine

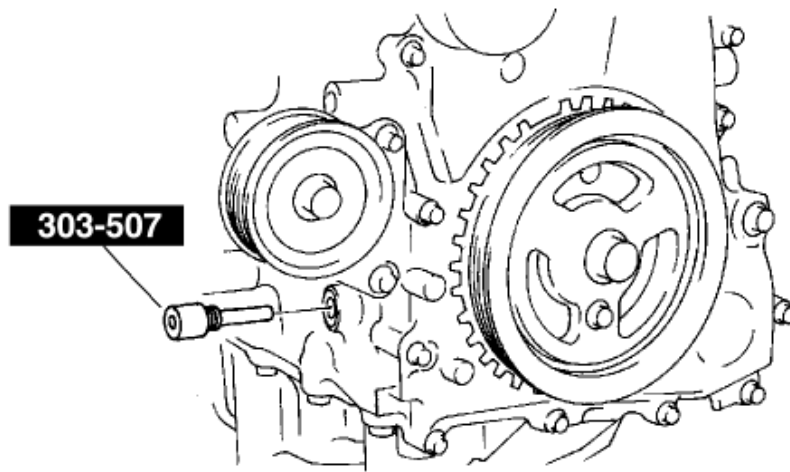
### FRONT OIL SEAL REPLACEMENT [LF]

1. Remove the battery and battery tray. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
2. Remove the air cleaner. (See [AIR CLEANER ELEMENT INSPECTION \[LF\]](#).)
3. Remove the drive belt. (See [DRIVE BELT INSPECTION \[LF\]](#).)
4. Remove the under cover. (See [TRANSVERSE MEMBER REMOVAL/INSTALLATION](#).)
5. Remove the front suspension tower bar. (joint)
6. Remove the ignition coil. (See [IGNITION COIL REMOVAL/INSTALLATION \[LF\]](#).)
7. Remove the OCV connector.
8. Remove the cylinder head cover. (See [TIMING CHAIN REMOVAL/INSTALLATION \[LF\]](#).)
9. Remove the CKP sensor. (See [CRANKSHAFT POSITION \(CKP\) SENSOR REMOVAL/INSTALLATION \[LF\]](#).)
10. Remove in the order indicated in the table.
11. Install in the reverse order of removal.

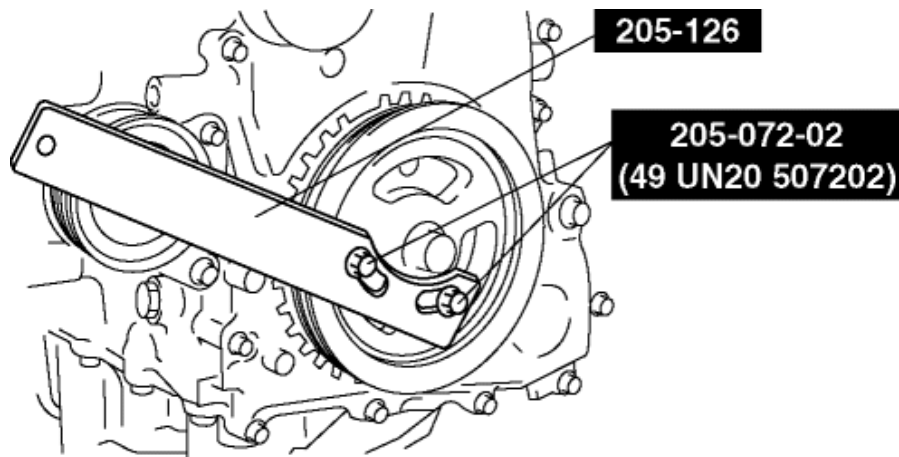


## Crankshaft Pulley Lock Bolt Removal Note

1. Remove the cylinder block lower blind plug.
2. Install the **SST**.



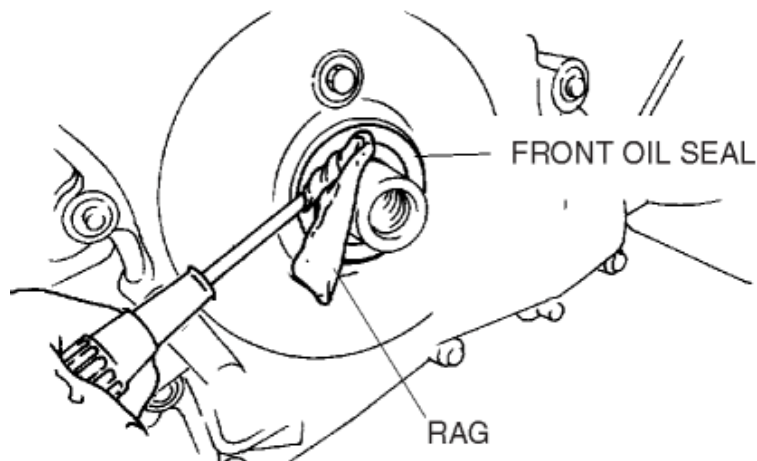
3. Turn the crankshaft clockwise until the crankshaft is in the No.1 cylinder TDC position (until the balance weight contacts the **SST**).
4. Hold the crankshaft pulley using the **SSTs**.



5. Remove the crankshaft pulley lock bolt.

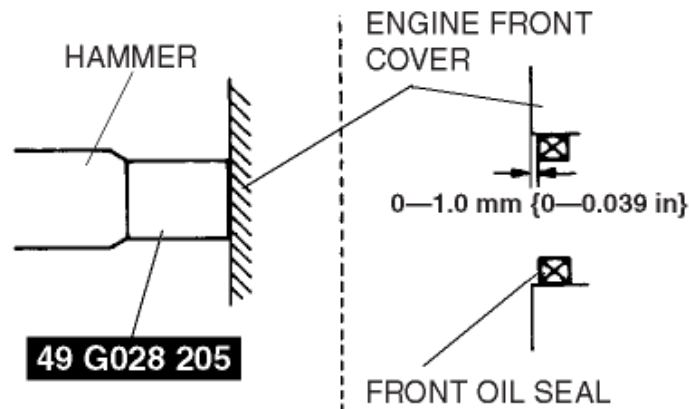
### Front Oil Seal Removal Note

1. Cut the oil seal lip using a razor knife.
2. Remove the oil seal using a screwdriver wrapped with a rag.



## Front Oil Seal Installation Note

1. Apply clean engine oil to a new oil seal.
2. Push the front oil seal in the engine front cover by hand.
3. Tap the oil seal in evenly using the **SST** and a hammer.

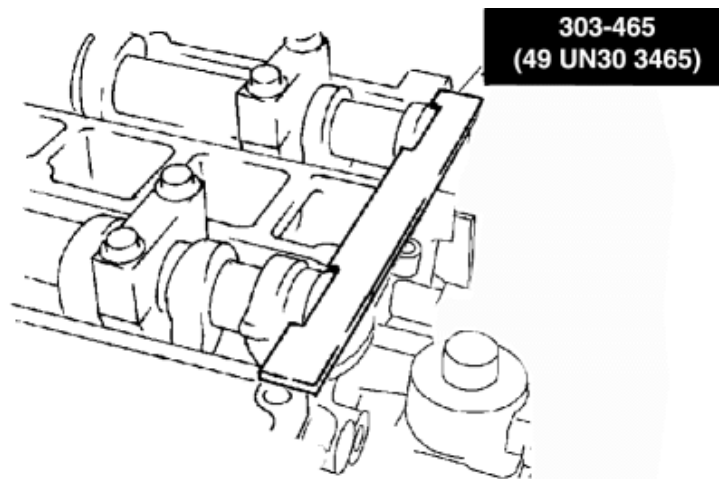


### Front oil seal press-in amount

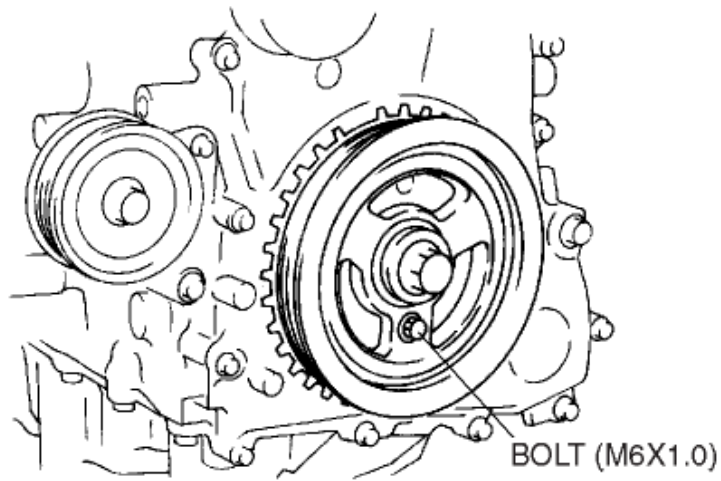
- 0—1.0 mm {0—0.039 in}

## Crankshaft Pulley Lock Bolt Installation Note

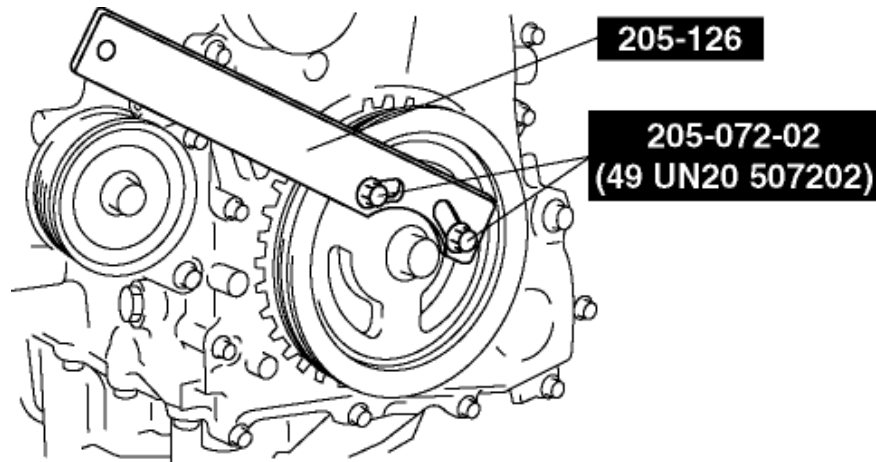
1. Install the **SST** on the camshaft as shown.



2. Verify that cylinder No.1 is at TDC of the compression stroke. (Crankshaft balance weight contacts **SST**.)
3. To position the crankshaft pulley, temporarily tighten it and, using a suitable bolt (**M6 X 1.0 length 25 mm—35 mm {0.99 in—1.37 in}**), fix the crankshaft pulley to the engine front cover.



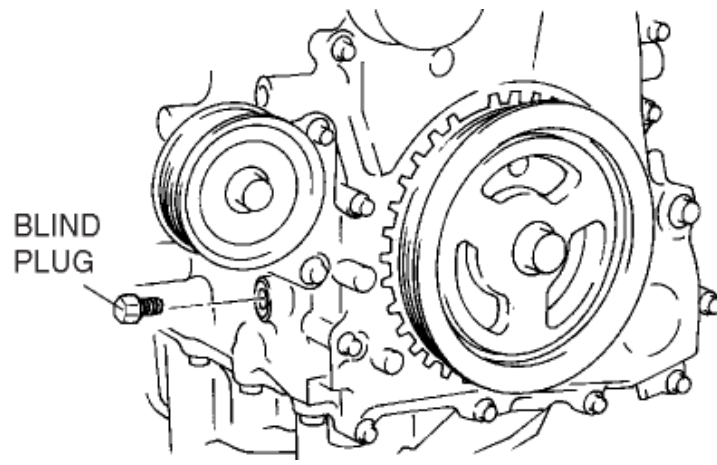
4. Install the **SSTs** to the crankshaft pulley, lock the crankshaft against rotation.



5. Tighten the crankshaft pulley lock bolt in the order shown using the following two steps.
  - a. Tighten to **96—104 N·m {9.8—10.6 kgf·m, 70.9—76.7 ft·lbf}**
  - b. Tighten **87°—93°**
6. Remove the **M6 x 1.0** bolt.
7. Remove the **SST** from the camshaft.
8. Remove the **SST** from the cylinder block lower blind plug.
9. Remove the **SST** from the crankshaft pulley.
10. Rotate the crankshaft clockwise two turns until the TDC position.
  - If not aligned, loosen the crankshaft pulley lock bolt and repeat from Step 1.
11. Install the cylinder block lower blind plug.

**Tightening torque:**

- 18—22 N·m {1.9—2.2 kgf·m, 13.3—16.2 ft·lbf}



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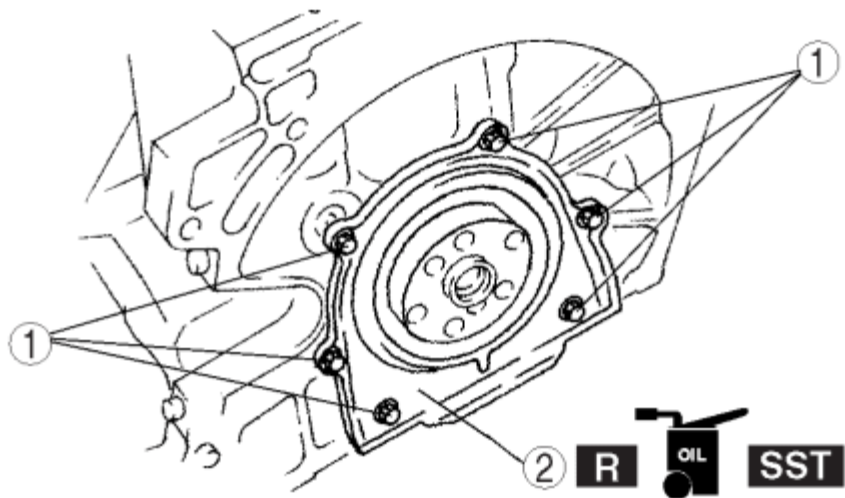
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2008 - MX-5 - Engine

REAR OIL SEAL REPLACEMENT [LF]

- 1. Remove the flywheel (MT) or Remove the drive plate (AT). (See [CLUTCH UNIT REMOVAL/INSTALLATION](#).) (See [DRIVE PLATE REMOVAL/INSTALLATION \[SJ6A-EL\]](#).)
- 2. Remove in the order indicated in the table.
- 3. Install in the reverse order of removal.



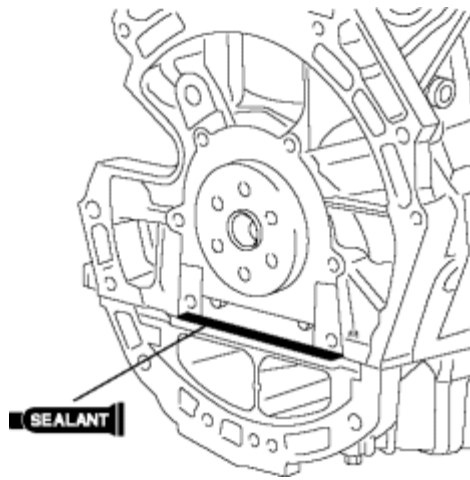
1	Bolt
2	Rear oil seal (See <a href="#">REAR OIL SEAL REPLACEMENT [LF]</a> )

Rear Oil Seal Installation Note

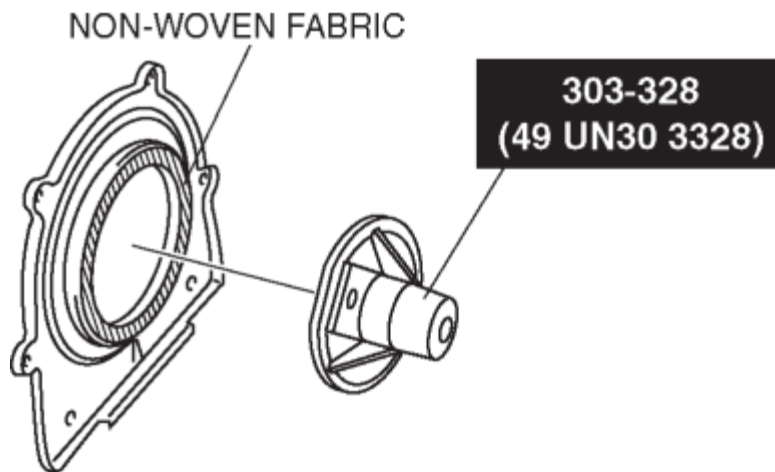
- 1. Apply silicone sealant to the mating faces as shown.

Thickness:

- 4.0—6.0 mm {0.16—0.23 in}

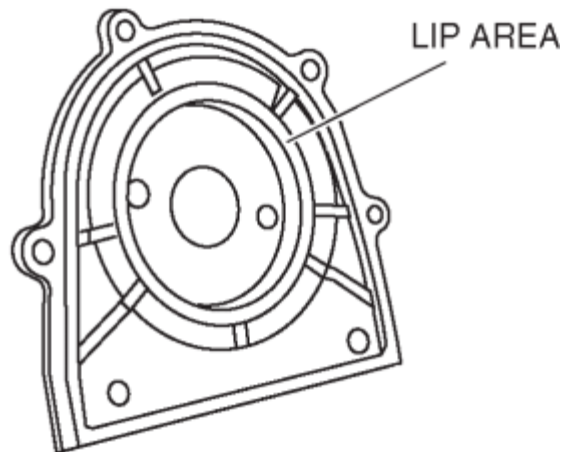


2. Apply clean engine oil to the new oil seal lip.
3. Install the **SST** to the non-woven fabric side of the rear oil seal.

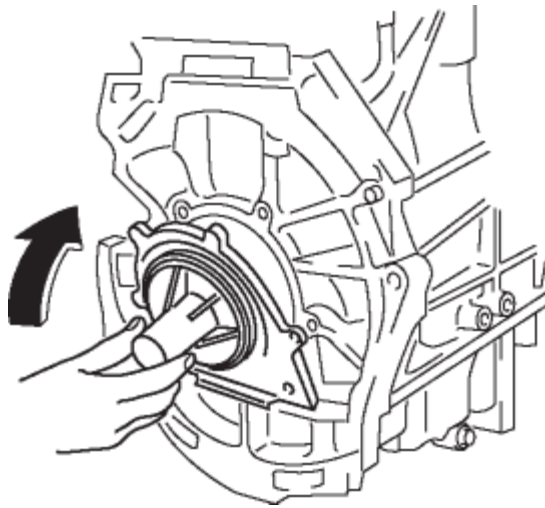


4. From the back side of the rear oil seal, verify that there is no damage or separation in the lip area of the rear oil seal.

#### BACK SIDE OF REAR OIL SEAL



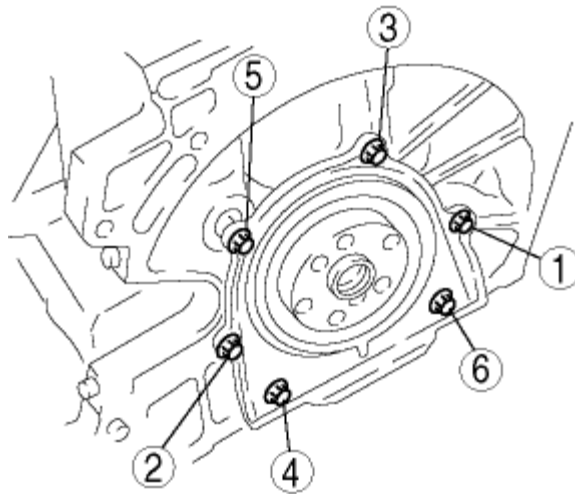
5. Install the rear oil seal to the engine as shown in the figure.



6. Tighten the rear oil seal bolts in the order as shown.

- Tightening torque:

8.0—11.5 N·m { 81.6—117.2 kgf·m, 70.9—101.7 in·lbf }



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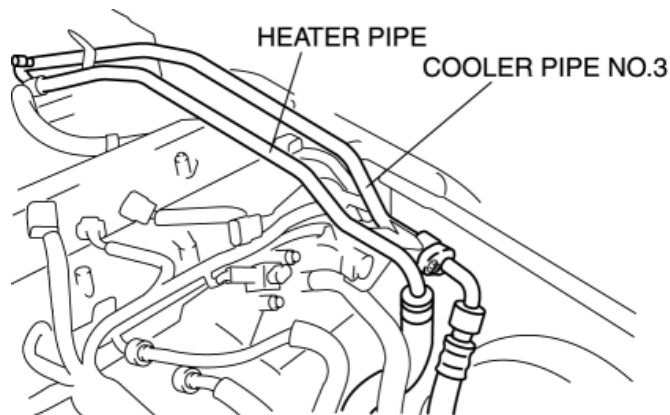
## 2008 - MX-5 - Engine

### TIMING CHAIN REMOVAL/INSTALLATION [LF]

#### WARNING:

- Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.
- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure". (See **BEFORE SERVICE PRECAUTION [LF]**.)

1. Remove the battery and battery tray. (See **BATTERY REMOVAL/INSTALLATION [LF]**.)
2. Remove the air cleaner. (See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [LF]**.)
3. Disconnect the ventilation hose. (See **QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/INSTALLATION [LF]**.)
4. Loosen the water pump pulley bolt and removal the drive belt. (See **DRIVE BELT REPLACEMENT [LF]**.)
5. Remove the front suspension tower bar (joint). (See **FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION.**)
6. Remove the CMP sensor. (See **CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION [LF]**.)
7. Disconnect the OCV connector.
8. Remove the ignition coils. (See **IGNITION COIL REMOVAL/INSTALLATION [LF]**.)
9. Remove the drive belt. (See **DRIVE BELT REPLACEMENT [LF]**.)
10. Remove the under cover. (See **TRANSVERSE MEMBER REMOVAL/INSTALLATION.**)
11. Remove the CKP sensor. (See **CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION [LF]**.)
12. Remove the P/S oil pump with the oil hose still connected and position the P/S oil pump so that it is out of the way. (See **POWER STEERING OIL PUMP REMOVAL/INSTALLATION.**)
13. Move the cooler pipe No.3 and heater pipe slightly out of the way.



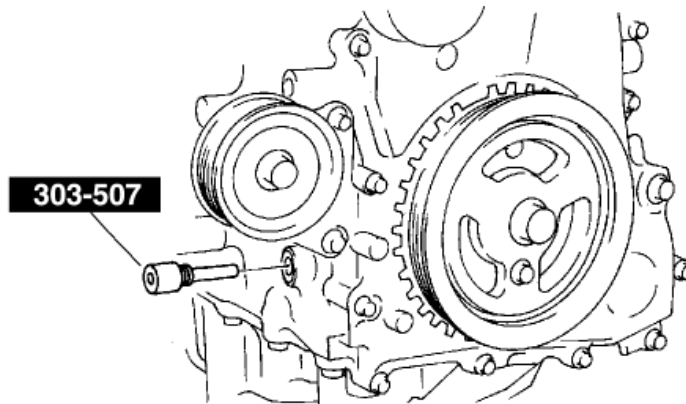
14. Remove in the order indicated in the table.
15. Install in the reverse order of removal.
16. Start the engine and:
  - Verify the ignition timing, idle speed and idle mixture. (See **ENGINE TUNE-UP [LF]**.)
17. Perform a road test.



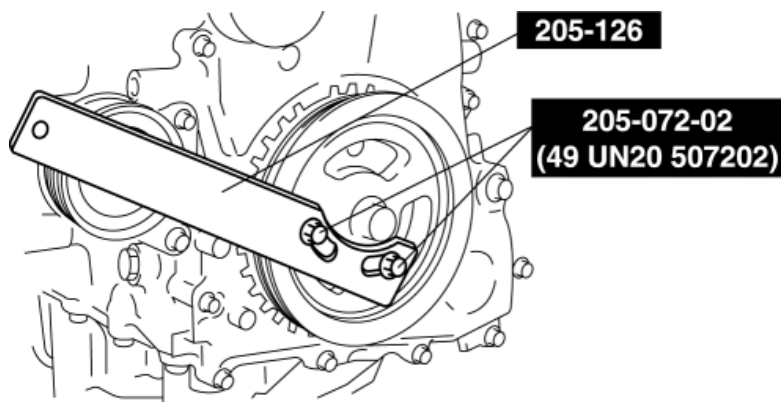
6	Drive belt idler pulley
7	Engine front cover (See <a href="#">Engine Front Cover Installation Note.</a> )
8	Front oil seal (See <a href="#">Front Oil Seal Removal Note.</a> ) (See <a href="#">Front Oil Seal Installation Note.</a> )
9	Chain tensioner (See <a href="#">Chain Tensioner Removal Note.</a> )
10	Tensioner arm
11	Chain guide
12	Timing chain (See <a href="#">Timing Chain Installation Note.</a> )
13	Oil pump chain tensioner
14	Oil pump chain guide
15	Oil pump sprocket (See <a href="#">Oil Pump Sprocket Removal Note.</a> ) (See <a href="#">Oil Pump Sprocket Installation Note.</a> )
16	Oil pump chain
17	Crankshaft sprocket

### Crankshaft Pulley Lock Bolt Removal Note

1. Remove the cylinder block lower blind plug.
2. Install the **SST**.



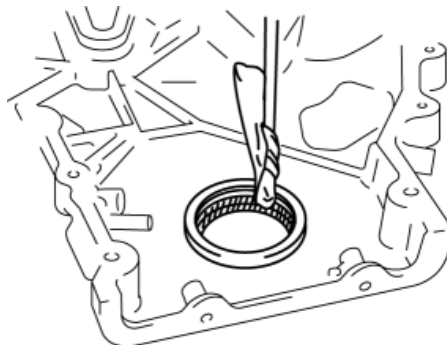
3. Turn the crankshaft clockwise until the crankshaft is in the No.1 cylinder TDC position (until the balance weight contacts the **SST**).
4. Hold the crankshaft pulley by using the **SSTs**.



5. Remove the crankshaft pulley lock bolt.

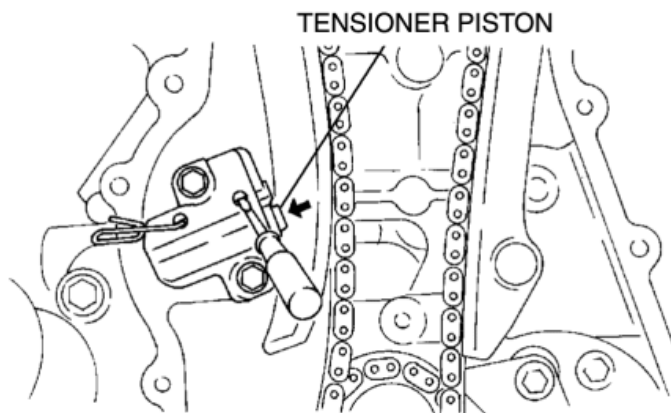
#### Front Oil Seal Removal Note

1. Remove the oil seal using a screwdriver as shown.



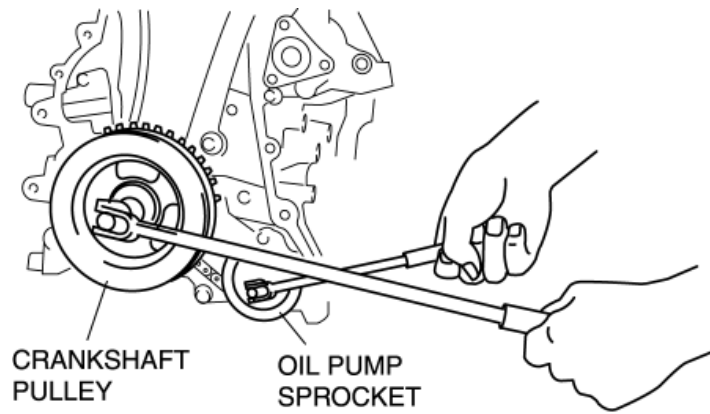
#### Chain Tensioner Removal Note

1. Using a thin screwdriver, hold the chain tensioner ratchet lock mechanism away from the ratchet stem.
2. Slowly compress the tensioner piston.
3. Hold the tensioner piston using a **1.5 mm {0.059 in}** wire or paper clip.



#### Oil Pump Sprocket Removal Note

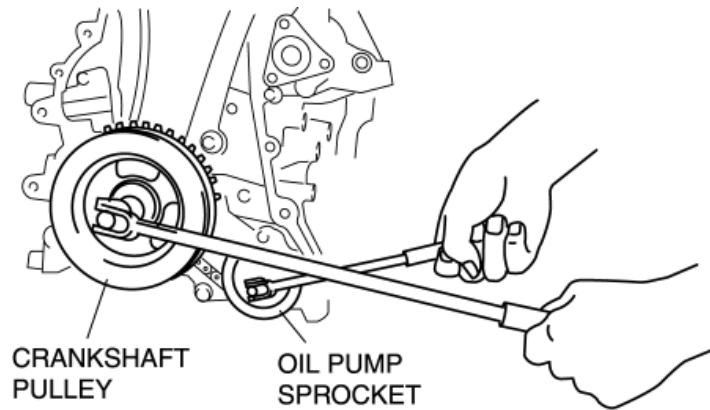
1. Temporarily install the crankshaft pulley and crankshaft pulley lock bolt to the crankshaft, and lock the oil pump against rotation as shown in figure.



2. Remove the oil pump sprocket, and then remove the crankshaft pulley and crankshaft pulley lock bolt.

### Oil Pump Sprocket Installation Note

1. Temporarily install the crankshaft pulley and crankshaft pulley lock bolt to the crankshaft, and lock the oil pump against rotation as shown in figure.



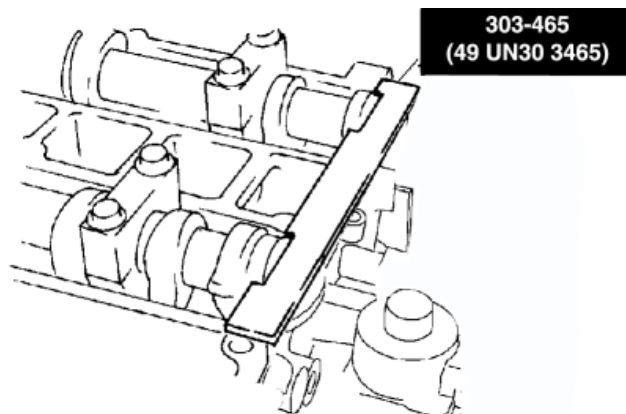
2. Install the oil pump sprocket, and then remove the crankshaft pulley and crankshaft pulley lock bolt.

### Tightening torque

- 20—30 N·m { 2.1—3.0 kgf·m, 14.8—22.1 ft·lbf }

### Timing Chain Installation Note

1. Install the **SST** to the camshaft as shown.



2. Install the timing chain.
3. Remove the retaining wire or paper clip from the chain tensioner to apply tension to the timing chain.



## Engine Front Cover Installation Note

### NOTE:

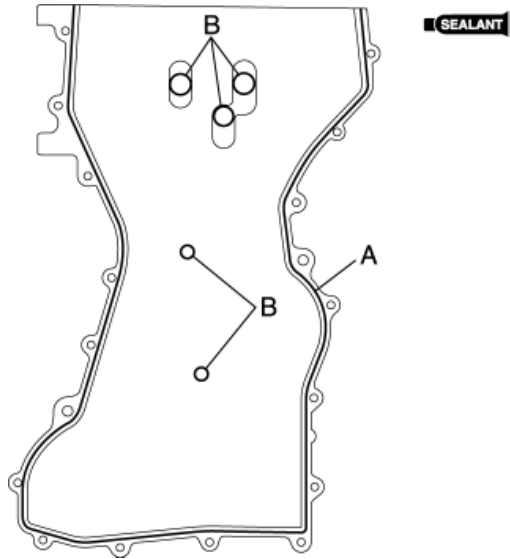
- Install the front oil seal before performing the following procedure.

1. Apply silicone sealant to the engine front cover as shown.

### CAUTION:

- Install the engine front cover before the applied silicone sealant starts to harden.
- Completely remove any oil, dirt, sealant, or other foreign matter adhering to the engine front cover and engine front cover installation surface. If any oil, dirt, sealant, or other foreign matter is not removed from the space between the engine front cover and engine front cover installation surface, it may cause a sealing malfunction.

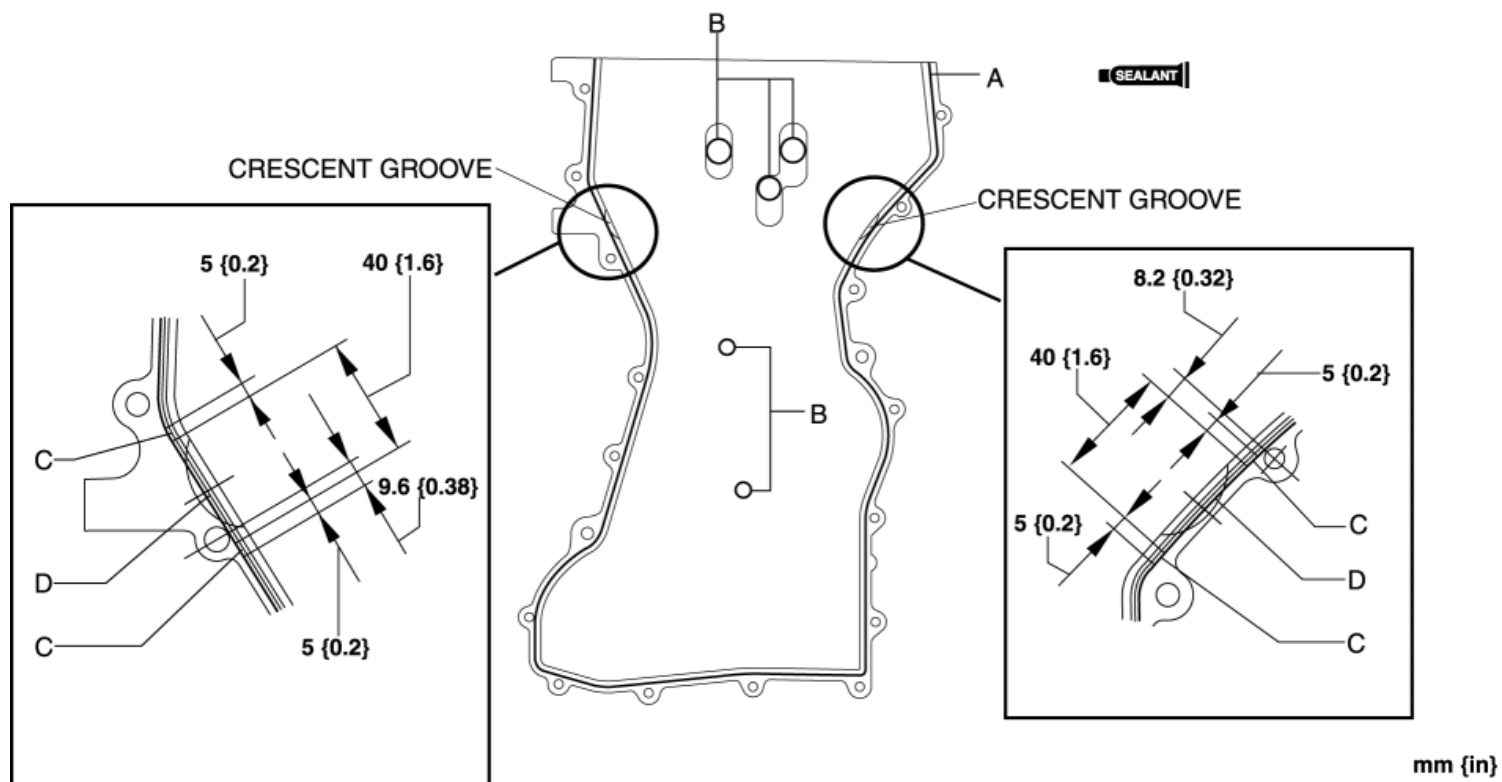
Without crescent grooves at joint sections of cylinder head and cylinder block



### Thickness

- A: 2.2—3.2 mm {0.087—0.12 in}
- B: 1.5—2.5 mm {0.06—0.098 in}

With crescent grooves at joint sections of cylinder head and cylinder block

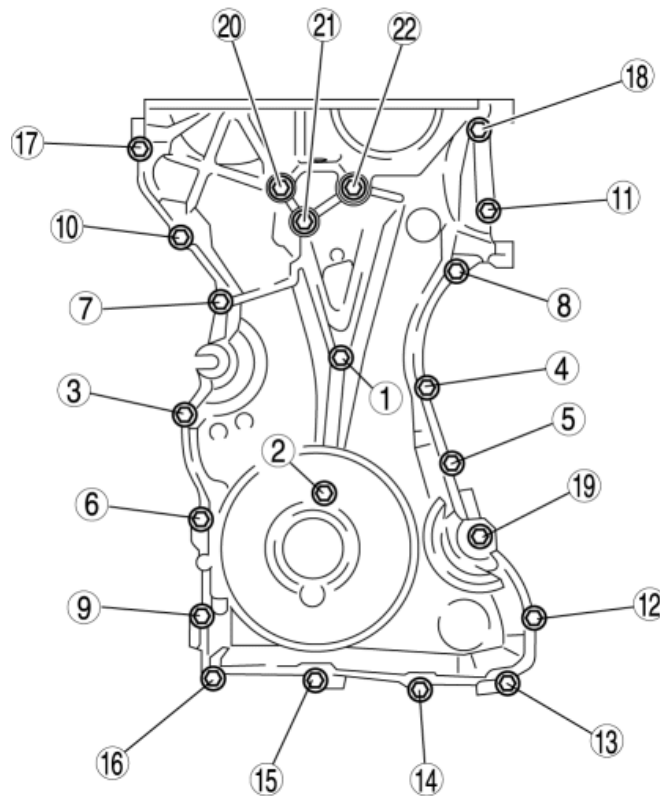


#### Thickness

- A: 2.2—3.2 mm {0.087—0.12 in}
- B: 1.5—2.5 mm {0.06—0.098 in}
- C: 2.2—4.3 mm {0.087—0.16 in}
- D: 3.3—4.3 mm {0.13—0.16 in}

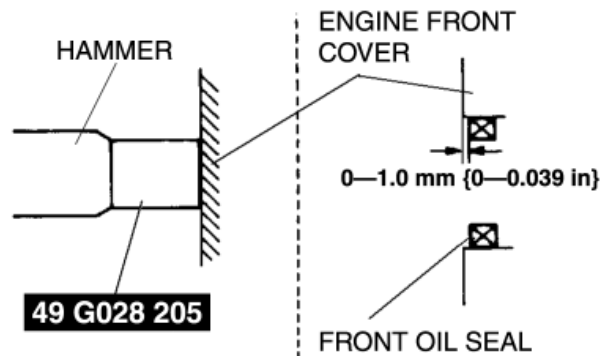
2. Install the engine front cover bolts in the order as shown.

Bolt No.	Tightening torque
1—18	<b>8.0—11.5 N·m {81.6—117.2 kgf·cm, 70.9—101.7 in·lbf}</b>
19—22	<b>40—55 N·m {4.1—5.6 kgf·m, 29.7—40.5 ft·lbf}</b>



#### Front Oil Seal Installation Note

1. Apply clean engine oil to a new oil seal.
2. Push the front oil seal in the engine front cover by hand.
3. Compress the oil seal using the **SST** and a hammer.

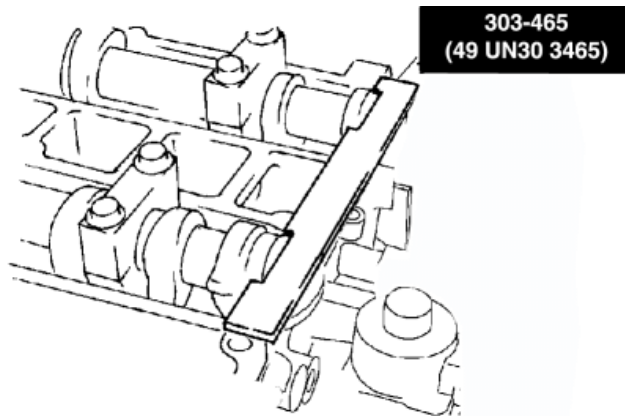


#### Front oil seal press-in amount

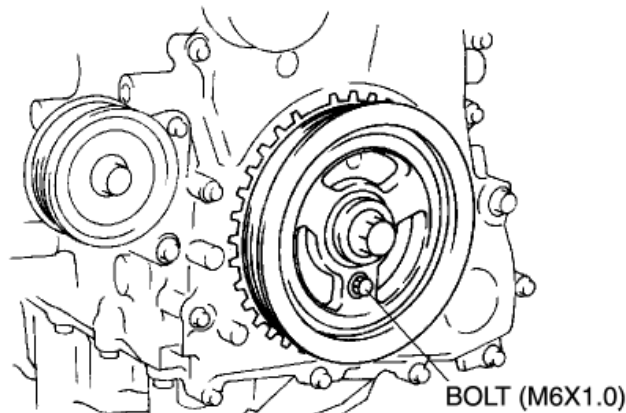
- 0—1.0 mm {0—0.039 in}

#### Crankshaft Pulley Lock Bolt Installation Note

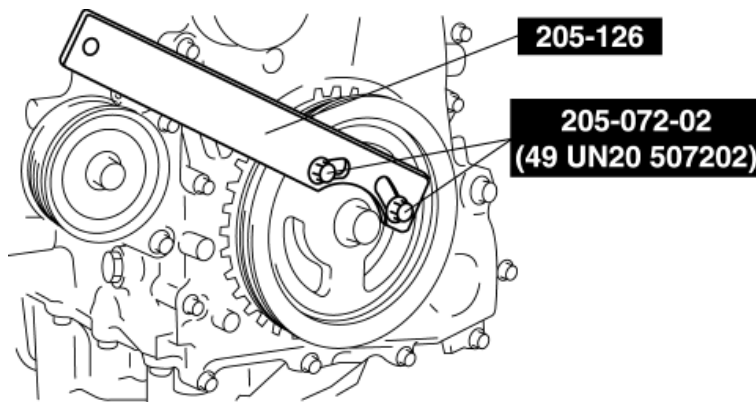
1. Install the **SST** to the camshaft as shown.



2. Verify that cylinder No.1 is at TDC of the compression stroke. (Crankshaft balance weight contacts **SST**.)
3. To position the crankshaft pulley, temporarily tighten it and, using a suitable bolt (**M6 X 1.0 length 25 mm—35 mm {0.99 in—1.37 in}**), fix the crankshaft pulley to the engine front cover.



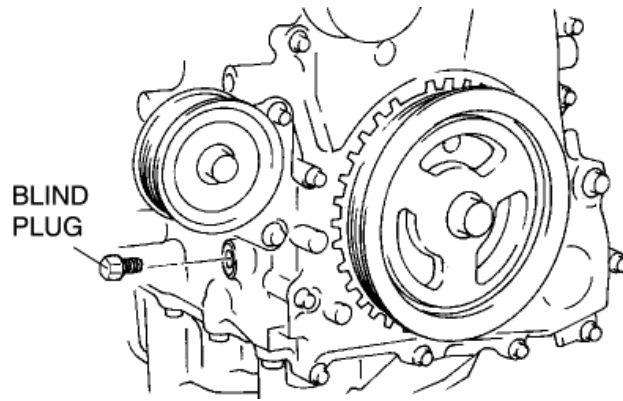
4. Install the **SSTs** to the crankshaft pulley, lock the crankshaft against rotation.



5. Tighten the crankshaft pulley lock bolt using the following two steps.
  - a. Tighten to **96—104 N·m {9.8—10.6 kgf·m, 70.9—76.7 ft·lbf}**
  - b. Tighten **87°—93°**
6. Remove the **M6 x 1.0 bolt**.
7. Remove the **SST** from the camshaft.
8. Remove the **SST** from the cylinder block lower blind plug.
9. Remove the **SST** from the crankshaft pulley.
10. Rotate the crankshaft clockwise two turns until the TDC position.
  - If not aligned, loosen the crankshaft pulley lock bolt and repeat from Step 1.
11. Install the cylinder block lower blind plug.

**Tightening torque:**

- 18—22 N·m {1.9—2.2 kgf·m, 13.3—16.2 ft·lbf}



**Cylinder Head Cover Installation Note**

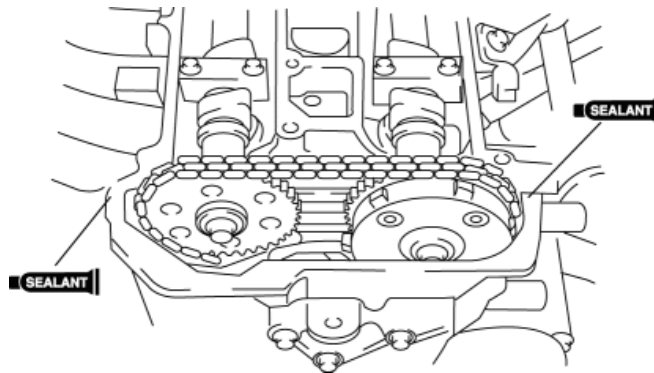
1. Apply silicone sealant to the mating surfaces as shown.

**CAUTION:**

- Install the cylinder head cover within 10 minutes of applying the silicone sealant.

**Thickness:**

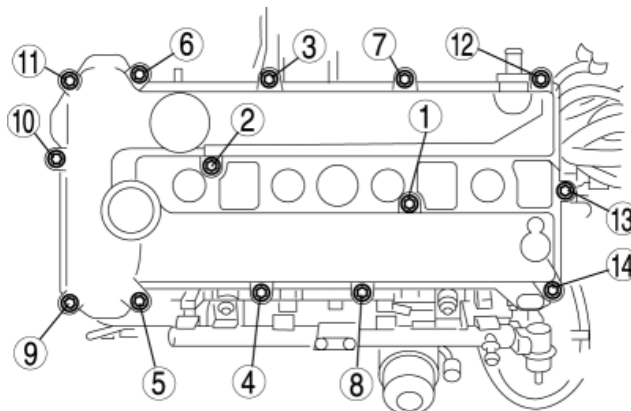
- 4.0—6.0 mm {0.16—0.23 in}



2. Install the cylinder head cover with a new gasket.
3. Tighten the bolts in the order shown.

**Tightening torque:**

- 8.0—9.5 N·m {82—96 kgf·cm, 71—84 in·lbf}



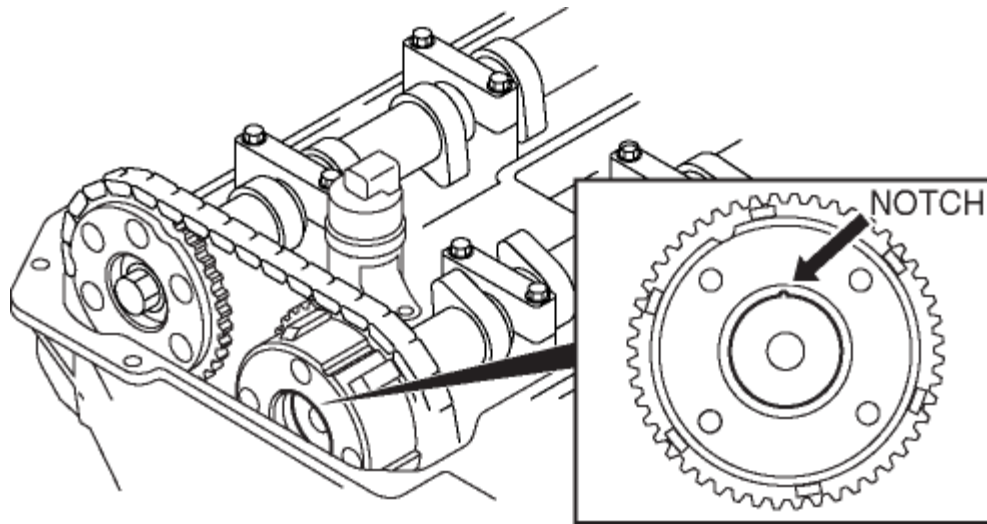


## 2008 - MX-5 - Engine

### VARIABLE VALVE TIMING ACTUATOR INSPECTION [LF]

#### CAUTION:

- Variable valve timing actuator can not be disassembled it is a precision unit.
1. Remove the battery cover.
  2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
  3. Remove the plug hole plate. (See [PLUG HOLE PLATE REMOVAL/INSTALLATION \[LF\]](#).)
  4. Disconnect the ventilation hose. (See [QUICK RELEASE CONNECTOR \(EMISSION SYSTEM\) REMOVAL/INSTALLATION \[LF\]](#).)
  5. Remove the front suspension tower bar (joint). (See [FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION](#).)
  6. Remove the CMP sensor. (See [CAMSHAFT POSITION \(CMP\) SENSOR REMOVAL/INSTALLATION \[LF\]](#).)
  7. Disconnect the OCV connector.
  8. Disconnect the P/S pressure switch connector.
  9. Remove the ignition coils. (See [IGNITION COIL REMOVAL/INSTALLATION \[LF\]](#).)
  10. Remove the cylinder head cover. (See [TIMING CHAIN REMOVAL/INSTALLATION \[LF\]](#).)
  11. Confirm that notch of the rotor and bump of the cover at the variable valve timing actuator are aligned and fitted.
    - If the notch and the bump are not aligned, turn the crankshaft clockwise two rotations. Verify that the bump and the notch are aligned.
    - If the bump and notch are still not aligned, replace the variable valve timing actuator.
    - If, when turning the crankshaft, there is a hitting noise from the variable valve timing actuator each time the cam passes the fully lifted position, it means that the actuator is not secured. Replace the actuator.



12. Install the cylinder head cover. (See [TIMING CHAIN REMOVAL/INSTALLATION \[LF\]](#).)
13. Install the ignition coils. (See [IGNITION COIL REMOVAL/INSTALLATION \[LF\]](#).)
14. Connect the P/S pressure switch connector.
15. Connect the OCV connector.
16. Install the CMP sensor. (See [CAMSHAFT POSITION \(CMP\) SENSOR REMOVAL/INSTALLATION \[LF\]](#).)
17. Install the front suspension tower bar (joint). (See [FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION](#).)
18. Connect the ventilation hose. (See [QUICK RELEASE CONNECTOR \(EMISSION SYSTEM\) REMOVAL/INSTALLATION \[LF\]](#).)
19. Install the plug hole plate. (See [PLUG HOLE PLATE REMOVAL/INSTALLATION \[LF\]](#).)
20. Install the battery cover.
21. Connect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)

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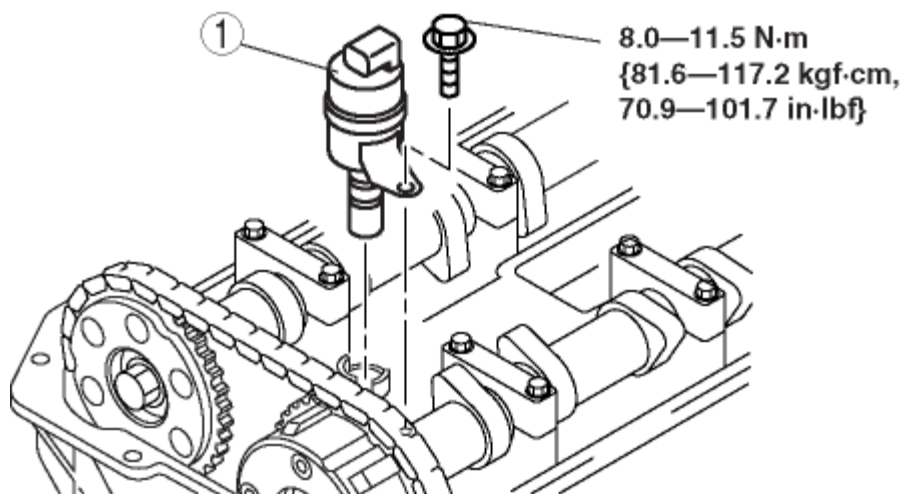
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## 2008 - MX-5 - Engine

### OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION [LF]

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the plug hole plate. (See [PLUG HOLE PLATE REMOVAL/INSTALLATION \[LF\]](#).)
4. Remove the ignition coils. (See [IGNITION COIL REMOVAL/INSTALLATION \[LF\]](#).)
5. Remove the CMP sensor. (See [CAMSHAFT POSITION \(CMP\) SENSOR REMOVAL/INSTALLATION \[LF\]](#).)
6. Remove the OCV connector.
7. Remove the ventilation hose. (See [QUICK RELEASE CONNECTOR \(EMISSION SYSTEM\) REMOVAL/INSTALLATION \[LF\]](#).)
8. Remove the cylinder head cover. (See [TIMING CHAIN REMOVAL/INSTALLATION \[LF\]](#).)
9. Remove in the order indicated in the table.
10. Install in the reverse order of removal.



1OCV

## 2008 - MX-5 - Engine

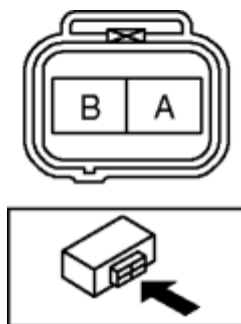
### OIL CONTROL VALVE (OCV) INSPECTION [LF]

#### Coil Resistance Inspection

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Disconnect the oil control valve connector.
4. Measure the resistance between terminals A and B using an ohmmeter.
  - If not as specified, replace the oil control valve. (See [OIL CONTROL VALVE \(OCV\) REMOVAL/INSTALLATION \[LF\]](#).)

#### Oil control valve resistance

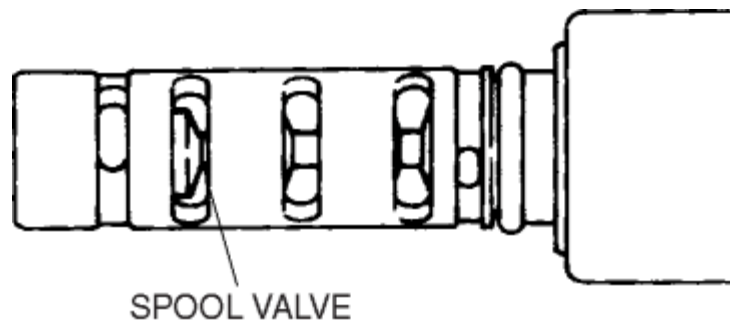
- 6.9—7.9 ohms [20°C {68°F}]



5. Connect the oil control valve connector.

#### Spool Valve Operation Inspection

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the oil control valve.
4. Verify that the spool valve in the oil control valve is in the maximum valve timing retard position as indicated in the figure.
  - If not as specified, replace the oil control valve. (See [OIL CONTROL VALVE \(OCV\) REMOVAL/INSTALLATION \[LF\]](#).)



5. Verify that the battery is fully charged.

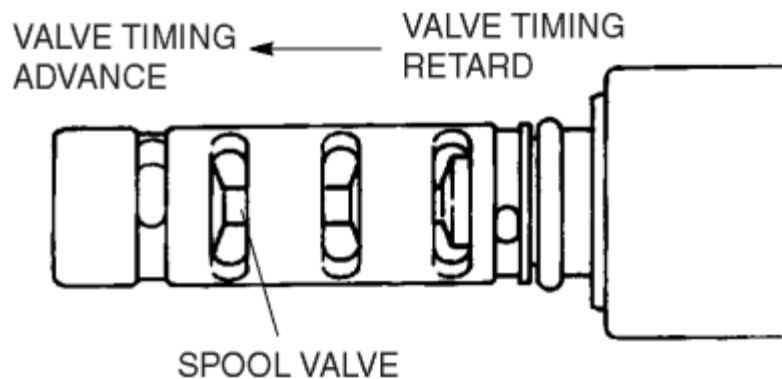
- If not as specified, recharge the battery. (See [BATTERY INSPECTION \[LF\]](#).)

6. Apply battery positive voltage between the oil control valve terminals and verify that the spool valve operates and moves to the maximum valve timing advance position.

- If not as specified, replace the oil control valve.

**NOTE:**

- When applying battery positive voltage between the oil control valve terminals, the connection can be either of the following:
  - Positive battery cable to terminal A, negative battery cable to terminal B
  - Positive battery cable to terminal B, negative battery cable to terminal A



7. Stop applying battery positive voltage and verify that the spool valve returns to the maximum valve timing retard position.

- If not as specified, replace the oil control valve.

## 2008 - MX-5 - Engine

### DRIVE BELT INSPECTION [LF]

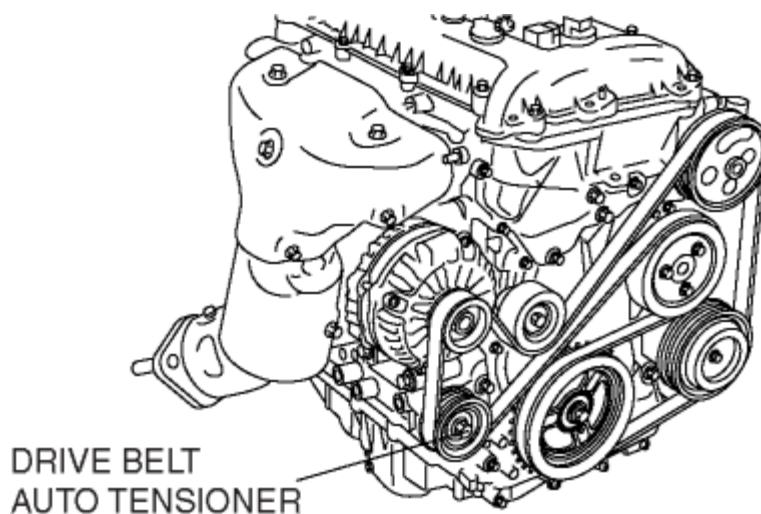
#### NOTE:

- Drive belt deflection/tension inspection is not necessary because of the use of the auto tensioner.

1. Remove the battery and battery tray. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)

#### NOTE:

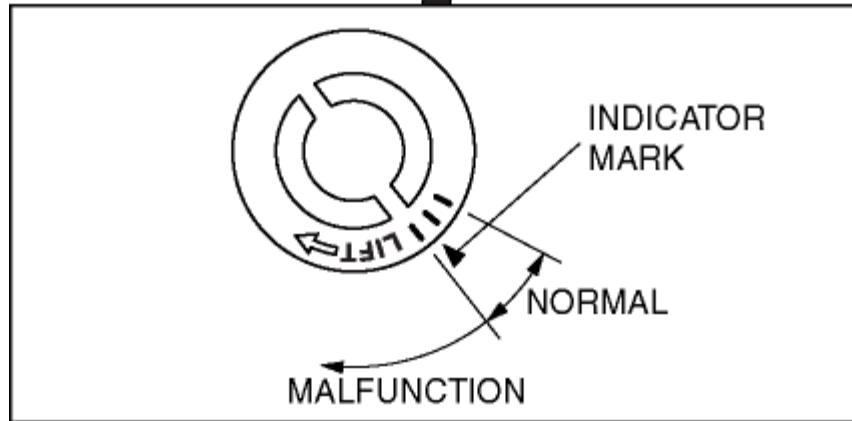
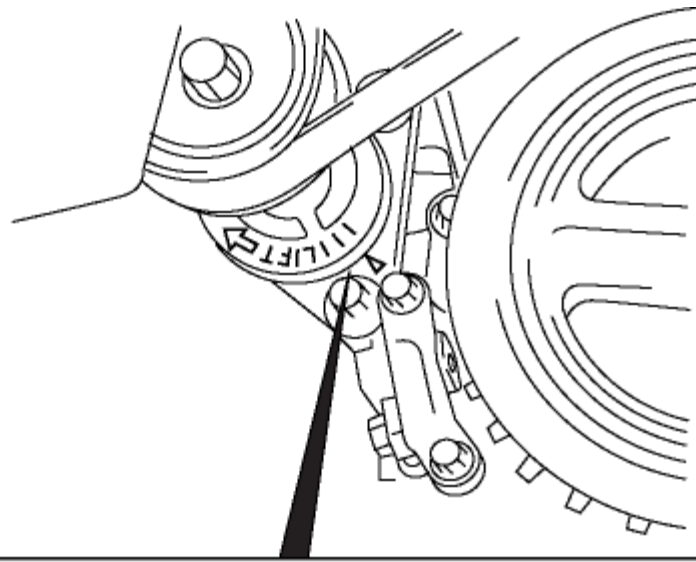
- Use a mirror to see the position of the drive belt auto tensioner indicator mark.



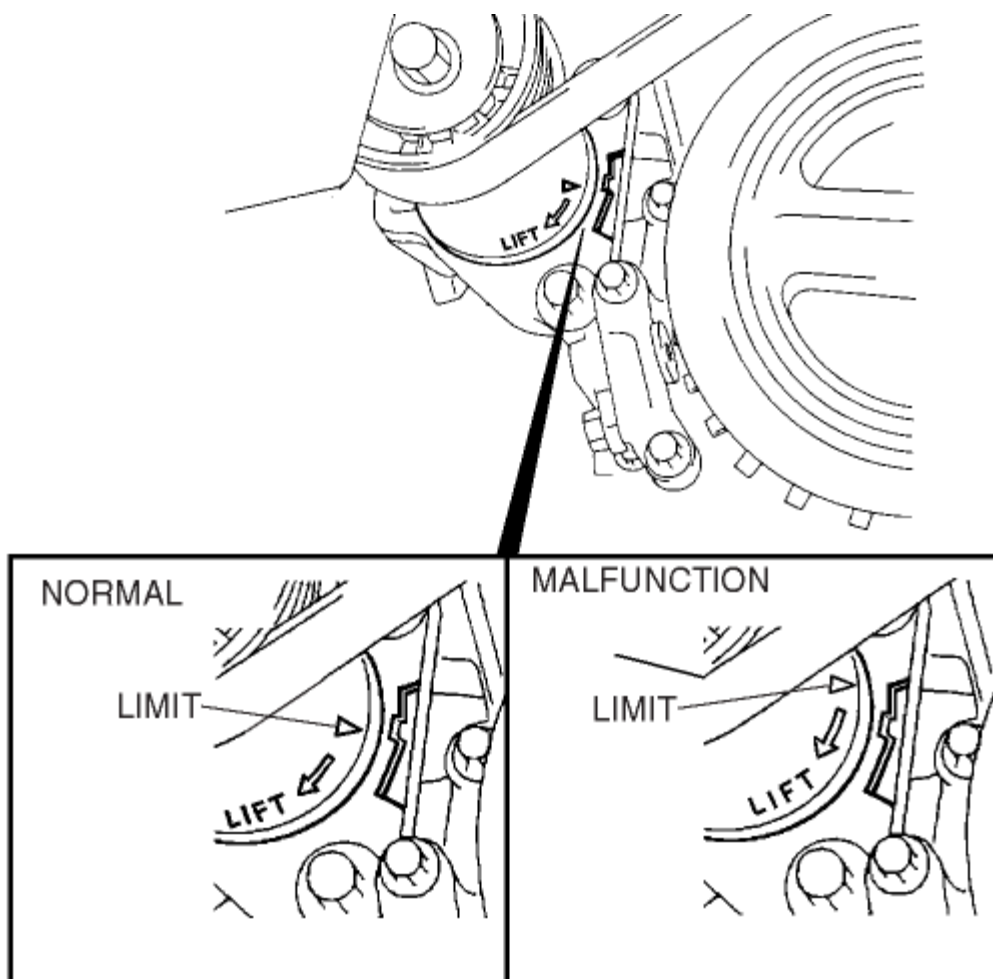
2. Verify that the drive belt auto tensioner indicator mark does not exceed the limit.

- If it exceeds the limit, replace the drive belt. (See [DRIVE BELT REPLACEMENT \[LF\]](#).)

AT



MT



3. Install the battery and battery tray. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)

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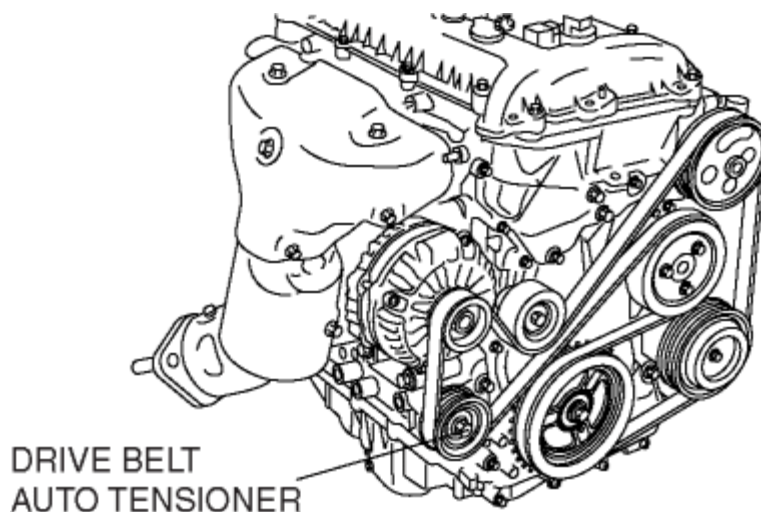
## 2008 - MX-5 - Engine

### DRIVE BELT AUTO TENSIONER INSPECTION [LF]

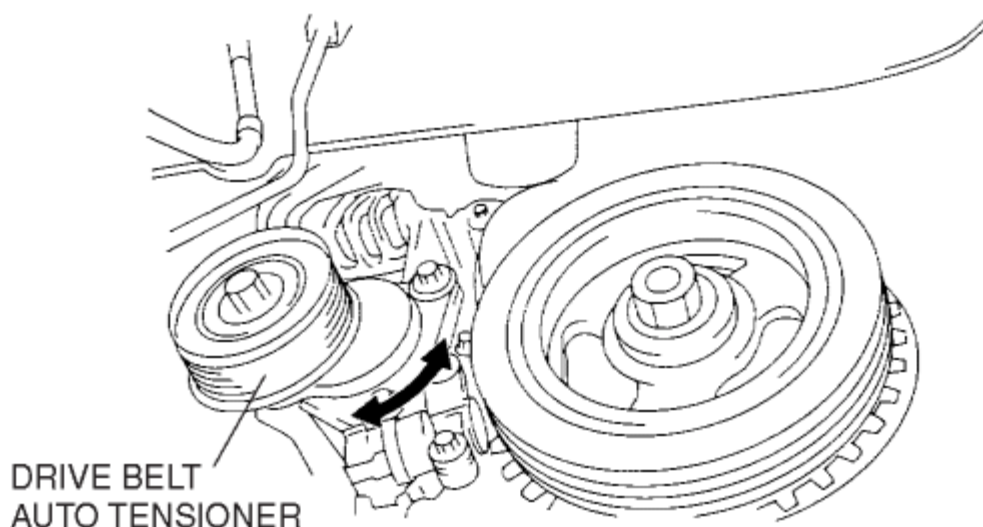
1. Remove the battery and battery tray. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
2. Remove the drive belt. (See [DRIVE BELT REPLACEMENT \[LF\]](#).)

#### NOTE:

- Use a mirror to see the position of the drive belt auto tensioner indicator mark.



3. Verify that the drive belt auto tensioner moves smoothly in the operational direction.
- Replace the drive belt auto tensioner if necessary.



4. Turn the drive belt auto tensioner pulley by hand and verify that it rotates smoothly.
- Replace the drive belt auto tensioner if necessary.
5. Install the drive belt. (See [DRIVE BELT REPLACEMENT \[LF\]](#).)

6. Install the battery and battery tray. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)

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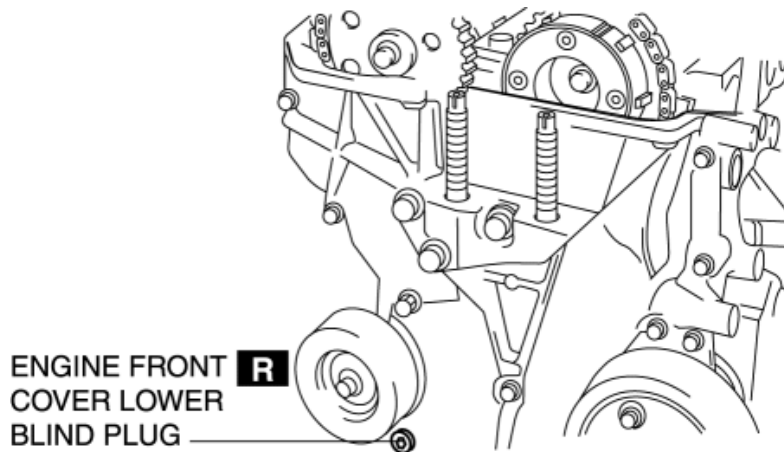
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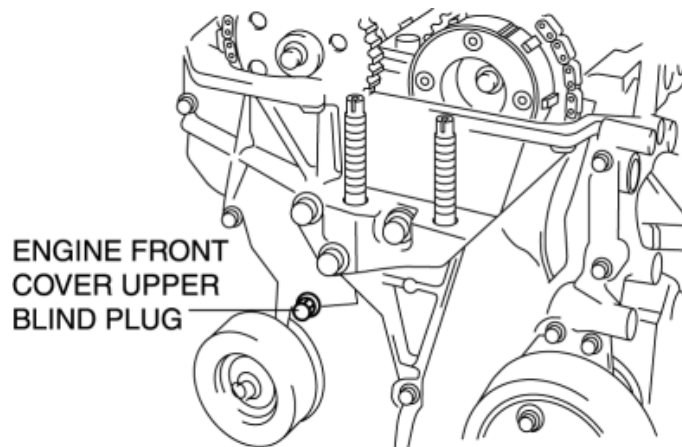
## 2008 - MX-5 - Engine

### VALVE CLEARANCE ADJUSTMENT [LF]

1. Remove the battery and battery tray. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
2. Remove the plug hole plate. (See [PLUG HOLE PLATE REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the air cleaner. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
4. Disconnect the ventilation hose. (See [QUICK RELEASE CONNECTOR \(EMISSION SYSTEM\) REMOVAL/INSTALLATION \[LF\]](#).)
5. Remove the front suspension tower bar (joint). (See [FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION](#).)
6. Remove the CMP sensor. (See [CAMSHAFT POSITION \(CMP\) SENSOR REMOVAL/INSTALLATION \[LF\]](#).)
7. Disconnect the OCV connector.
8. Disconnect the P/S pressure switch connector.
9. Remove the ignition coils. (See [IGNITION COIL REMOVAL/INSTALLATION \[LF\]](#).)
10. Remove the cylinder head cover. (See [TIMING CHAIN REMOVAL/INSTALLATION \[LF\]](#).)
11. Remove the drive belt. (See [DRIVE BELT REPLACEMENT \[LF\]](#).)
12. Remove the engine front cover lower blind plug.

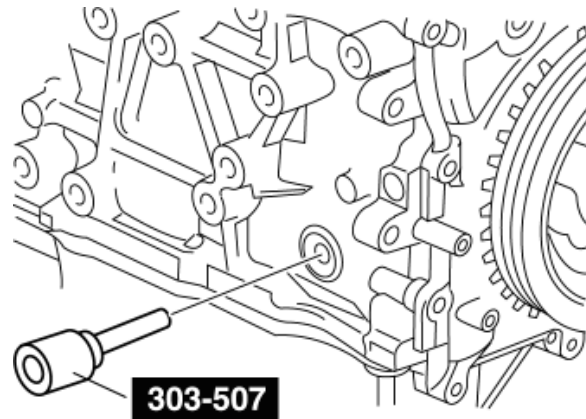


13. Remove the engine front cover upper blind plug.



14. Remove the cylinder block lower blind plug.

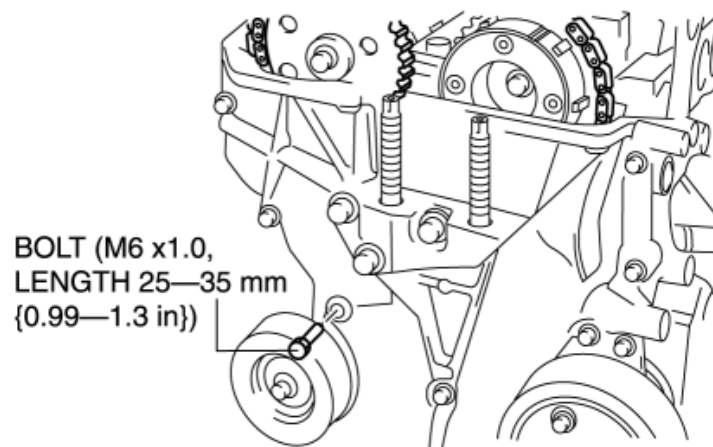
15. Install the **SST** as shown.



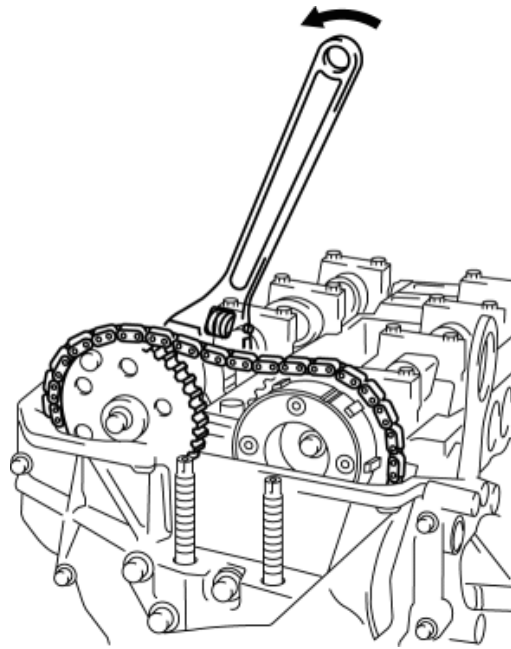
16. Turn the crankshaft clockwise until the crankshaft is in the No.1 cylinder TDC position.

17. Loosen the timing chain using the following procedure.

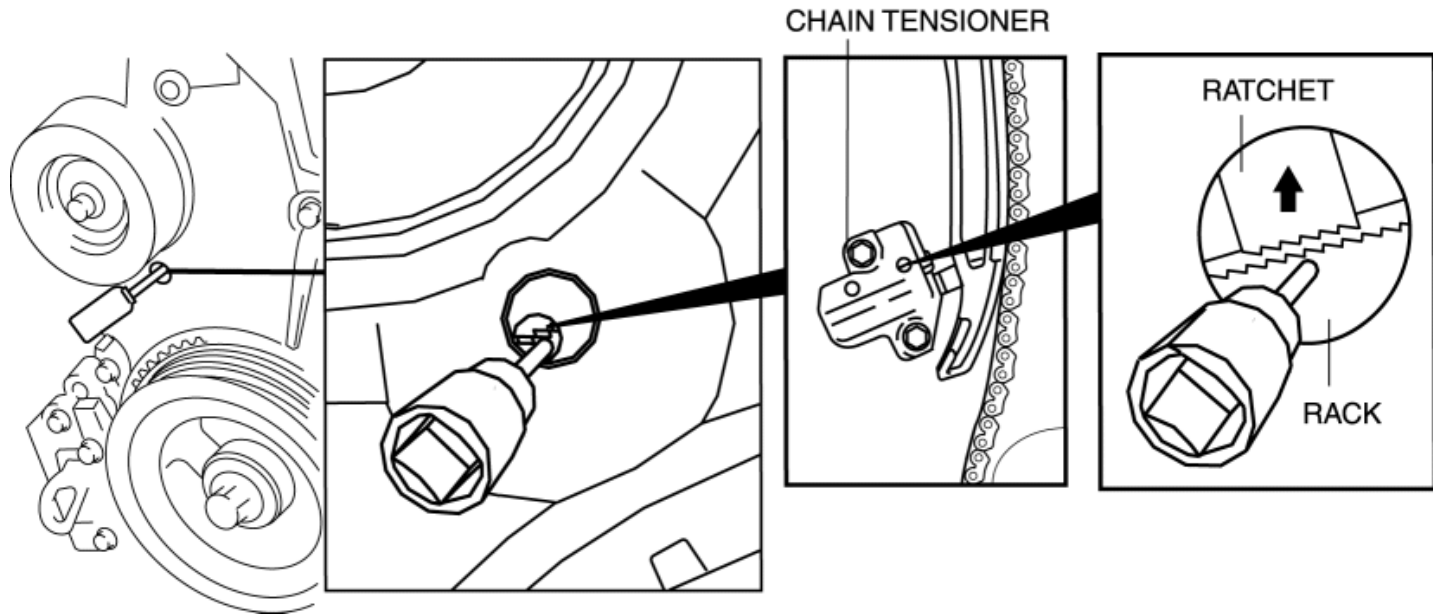
- a. Insert a suitable bolt (**M6 X 1.0, length 25—35 mm {0.99—1.3 in}**) into the engine front cover upper blind plug and tighten it until it contacts the chain tensioner arm, and then rotate it back one turn. (Set the bolt slightly away from the chain tensioner arm so that it does not contact it.)



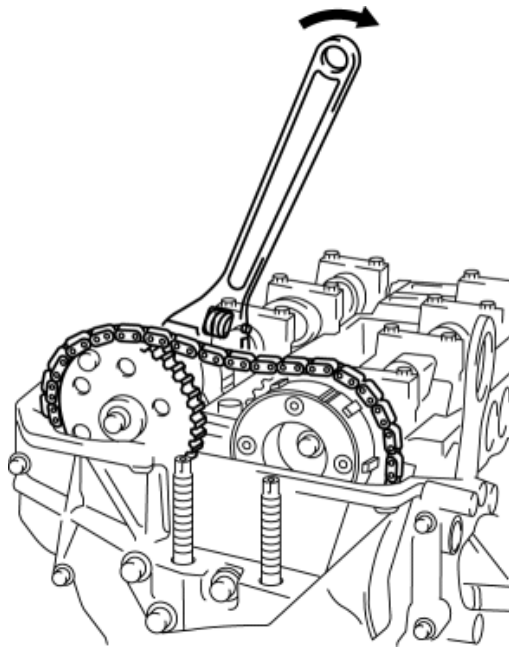
- b. Using the cast hexagon on the exhaust camshaft, apply force counterclockwise to facilitate unlocking the chain tensioner ratchet.



c. Using a Hex bit socket (**2.5 mm {0.098 in}**) or T15 Torx bit socket, unlock the chain tensioner ratchet so that it can be lifted up.

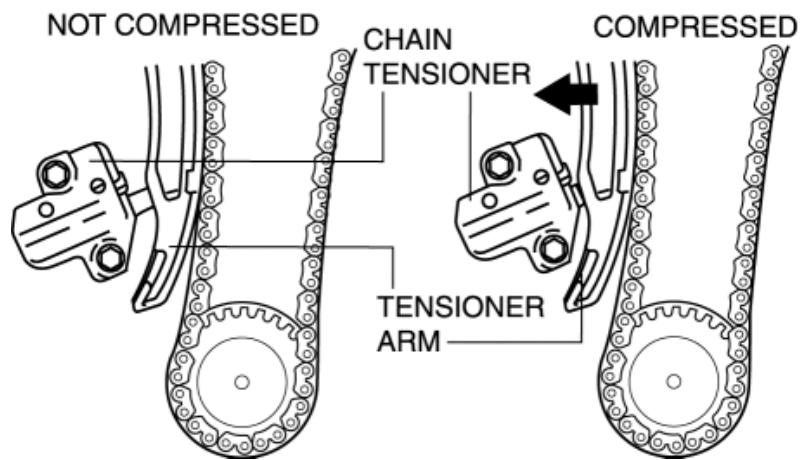


d. Using the cast hexagon on the exhaust camshaft, apply force in the direction of the engine rotation to increase tension on the chain.



**NOTE:**

- The chain tensioner rack is compressed using the chain tension generated by applying force to the exhaust camshaft in the direction of the engine rotation.



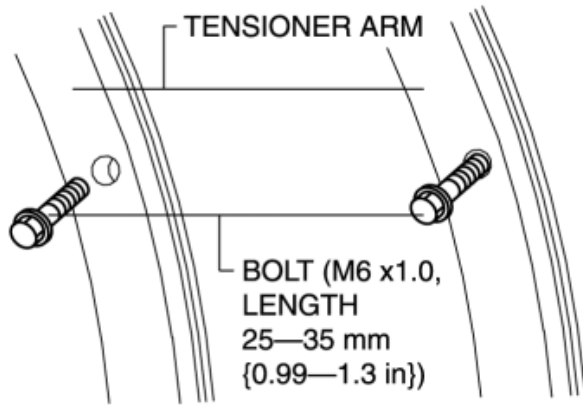
**NOTE:**

- The ratchet has not been unlocked if the bolt cannot be pressed in approx. 5 mm {0.2 in}.

e. Screw in the bolt set in Step 1 approx. 5 mm {0.2 in} and secure the tensioner arm with the rack compressed.

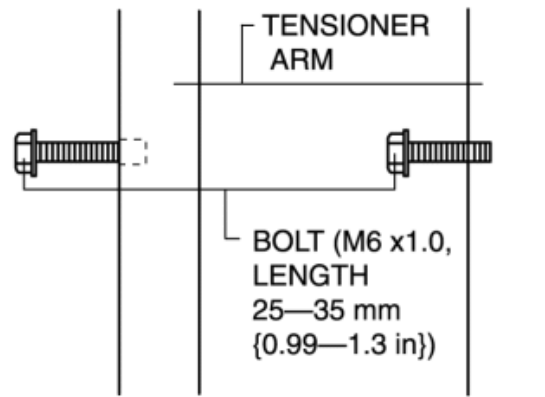
NOT UNLOCK

UNLOCK



NOT UNLOCK

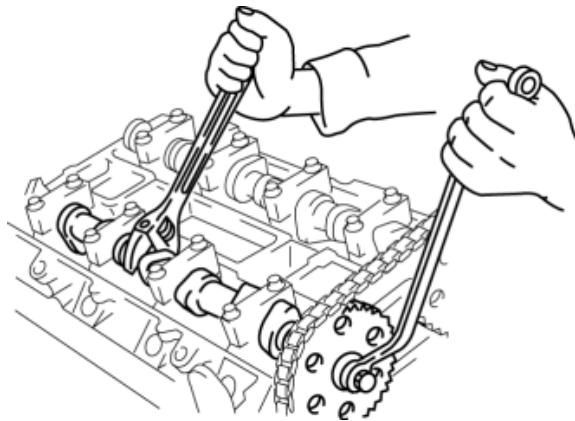
UNLOCK



## SECTIONAL VIEW

- If the tensioner arm cannot be secured, return the bolt to its original position and repeat the procedure from Step 3.

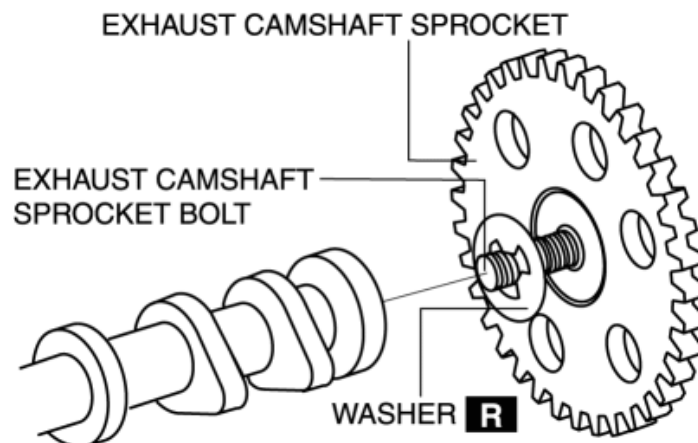
18. Hold the exhaust camshaft using a suitable wrench on the cast hexagon as shown.



## CAUTION:

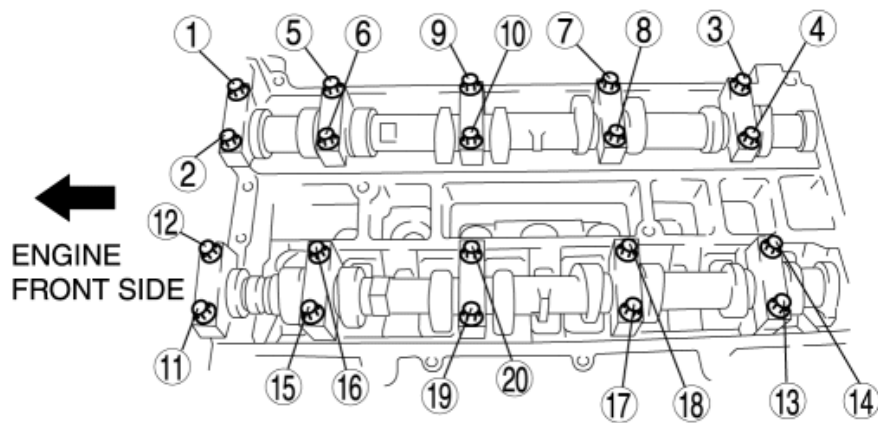
- Perform the work carefully so that the washer does not drop out.

19. Remove the exhaust camshaft sprocket bolt, exhaust camshaft sprocket, and washer as a single unit.



20. Remove the OCV. (See [OIL CONTROL VALVE \(OCV\) REMOVAL/INSTALLATION \[LF\]](#).)

21. Loosen the camshaft cap bolts in several passes in the order shown.



**NOTE:**

- The camshaft caps are to be kept ordered for correct reassembly in their original positions. Do not mix the caps.

22. Remove the camshafts.

23. Remove the tappet.

24. Select proper adjustment tappet.

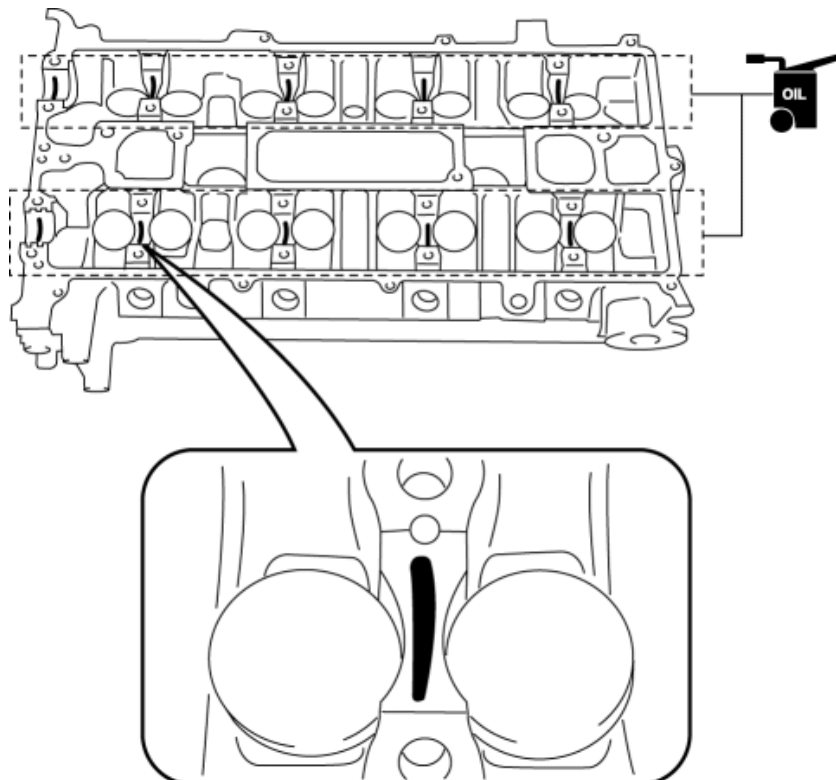
**New adjustment shim**

- $\text{New shim thickness} = \text{Removed shim thickness} + \text{Measured valve clearance} - \text{Standard valve clearance}$  (IN: 0.25 mm {0.0098 in}, EX: 0.30 mm {0.0118 in})

**Valve clearance [Engine cold]**

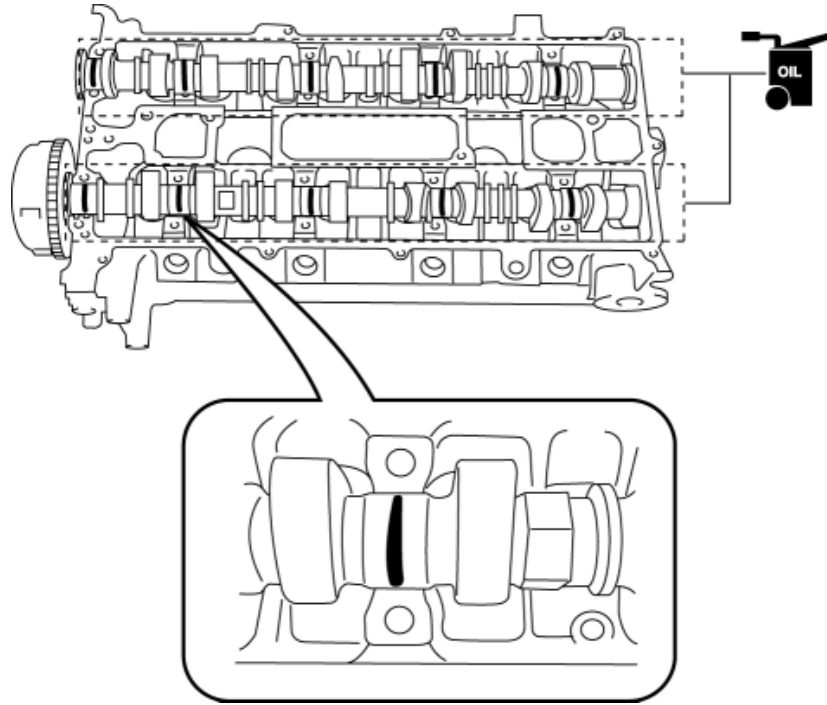
- IN: 0.22—0.28 mm {0.0087—0.0110 in}
- EX: 0.27—0.33 mm {0.0107—0.0129 in}

25. Apply the gear oil (SAE No.90 or equivalent) to each journal of the cylinder head as shown in the figure.

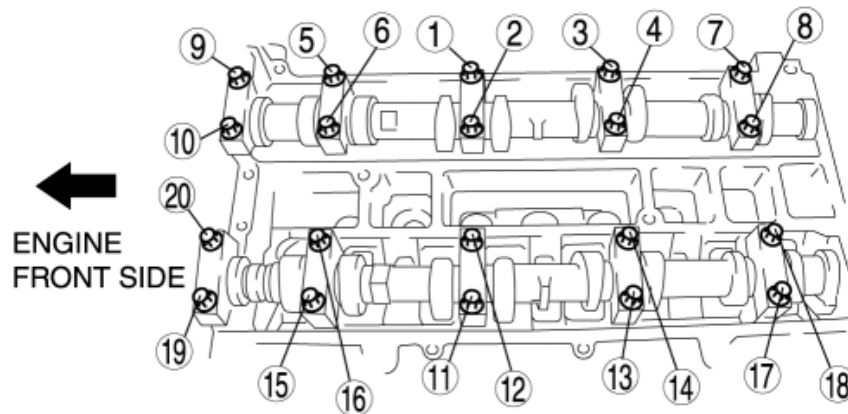


26. Install the camshaft with No.1 cylinder camshaft lobes aligned with the TDC position.

27. Apply the gear oil (SAE No.90 or equivalent) to each journal of the camshaft as shown in the figure.



28. Tighten the camshaft cap bolt with the following two steps.



#### Tightening torque

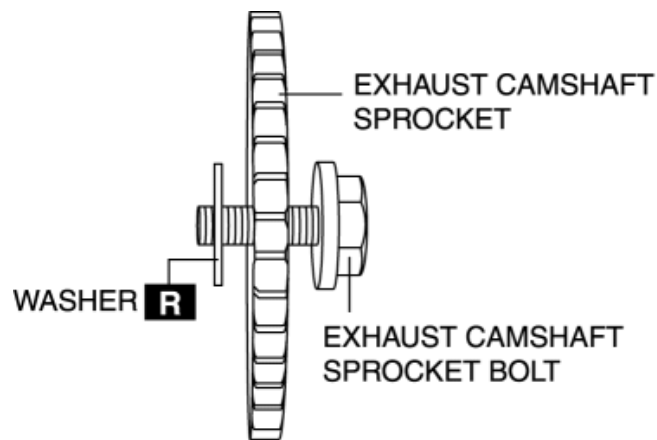
- (1) Tighten to 5.0—9.0 N·m {51.0—91.7 kgf·cm, 44.3—79.6 in·lbf}
- (2) Tighten to 14.0—17.0 N·m {1.5—1.7 kgf·m, 10.4—12.5 ft·lbf}

29. Install the OCV. (See [OIL CONTROL VALVE \(OCV\) REMOVAL/INSTALLATION \[LF\]](#).)

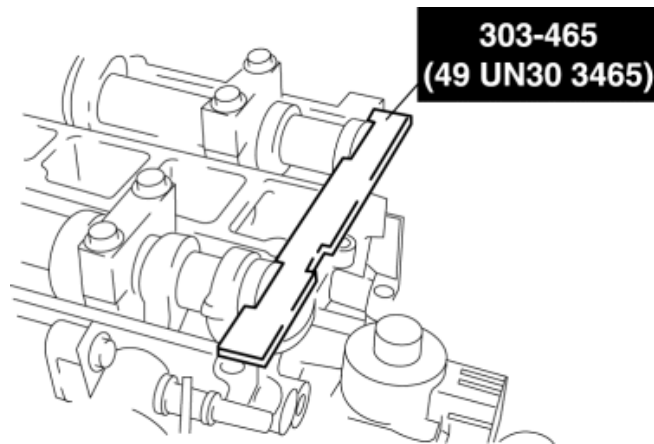
#### CAUTION:

- Install a washer to the fourth or fifth thread of the exhaust camshaft sprocket bolt being careful not to drop the washer.
- Do not tighten the camshaft sprocket bolt at this stage. Verify the valve timing before performing the bolt tightening.

30. Install the exhaust camshaft sprocket bolt, exhaust camshaft sprocket, and a new washer as a single unit.



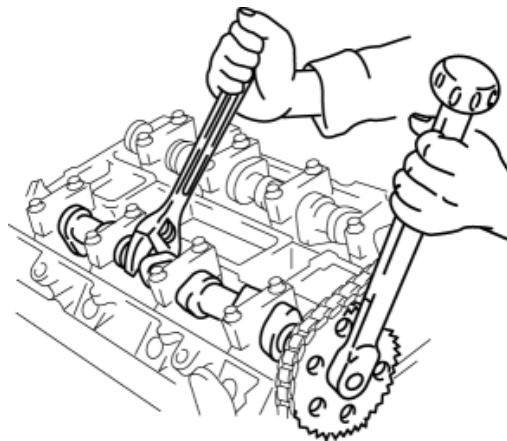
31. Install the **SST** to the camshaft as shown in the figure.



32. Remove the installation bolt for the engine front cover upper blind plug (**M6 X 1.0 length 25—35mm {0.99—1.3 in}**), and apply tension to the timing chain.

33. Turn the crankshaft clockwise until the crankshaft is in the No.1 cylinder TDC position.

34. Hold the exhaust camshaft using a suitable wrench on the cast hexagon as shown.



35. Tighten the exhaust camshaft sprocket lock bolt.

#### **Tightening torque**

- 69—75 N·m {7.1—7.6 kgf·m, 50.9—55.3 ft·lbf}

36. Remove the **SST** from the camshaft.

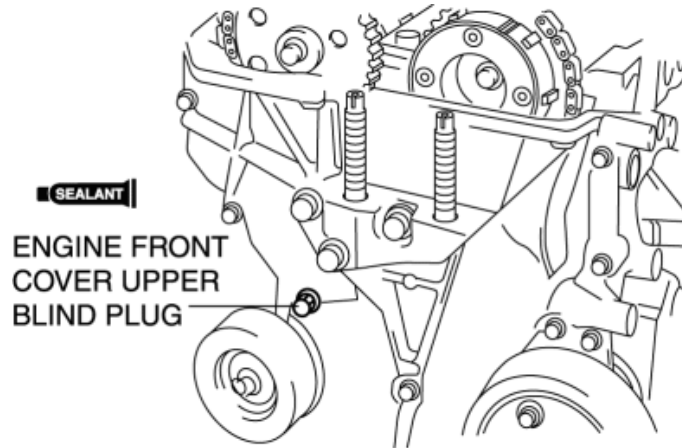
37. Remove the **SST** from the block lower blind plug.

38. Rotate the crankshaft clockwise two turns and inspect the valve timing.

- If not aligned, loosen the camshaft sprocket lock bolt and repeat the procedure from Step 31.



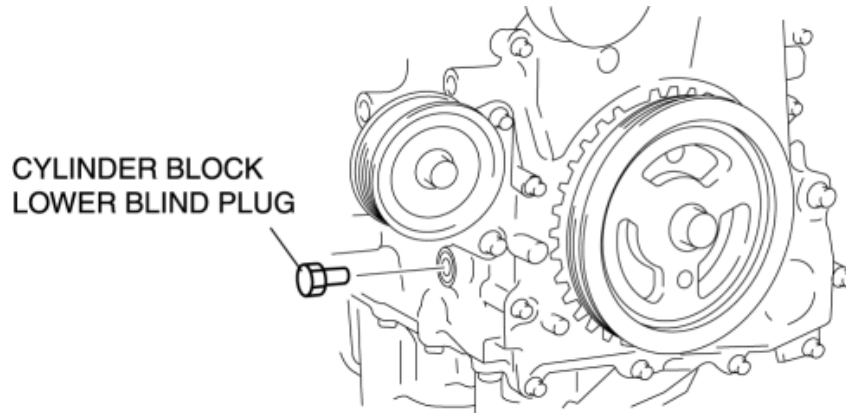
39. Apply silicone sealant to the engine front cover upper blind plug.
40. Install the engine front cover upper blind plug.



**Tightening torque**

- 8.0—11.5 N·m {82—117 kgf·cm, 71—101 in·lbf}

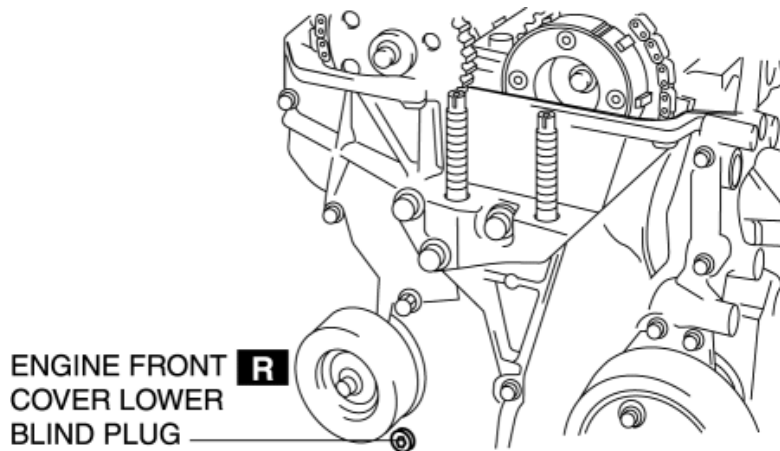
41. Install the cylinder block lower blind plug.



**Tightening torque**

- 18—22 N·m {1.9—2.2 kgf·m, 13.3—16.2 ft·lbf}

42. Install the new engine front cover lower blind plug.



**Tightening torque**

- 10—14 N·m {102—142 kgf·cm, 89—123 in·lbf}

43. Install the drive belt. (See [DRIVE BELT REPLACEMENT \[LF\]](#).)

44. Measure the valve clearance.

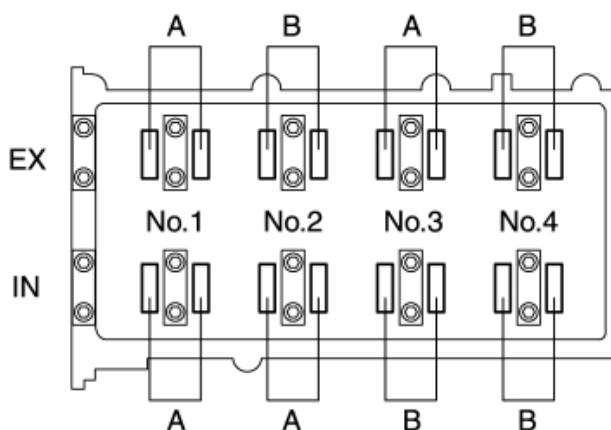
- a. Turn the crankshaft clockwise so that the No.1 piston is at TDC of the compression stroke.
- b. Measure the valve clearance at A in the figure.
  - If the valve clearance is out of the specification, adjust it. (See [VALVE CLEARANCE ADJUSTMENT \[LF\]](#).)

**NOTE:**

- Make sure to note down the measured values for choosing the suitable replacement tappets.

**Valve clearance [Engine cold]**

- IN: 0.22—0.28 mm {0.0087—0.0110 in}
- EX: 0.27—0.33 mm {0.0107—0.0129 in}



- c. Turn the crankshaft **360°** clockwise so that the No.4 piston is at TDC of the compression stroke.
- d. Measure the valve clearance at B in the figure.
  - If the valve clearance is out of the specification, adjust it. (See [VALVE CLEARANCE ADJUSTMENT \[LF\]](#).)

**NOTE:**

- Make sure to note down the measured values for choosing the suitable replacement tappets.

**Valve clearance [Engine cold]**

- IN: 0.22—0.28 mm {0.0087—0.0110 in}
- EX: 0.27—0.33 mm {0.0107—0.0129 in}

45. Install the cylinder head cover. (See [TIMING CHAIN REMOVAL/INSTALLATION \[LF\]](#).)

46. Install the ignition coils. (See [IGNITION COIL REMOVAL/INSTALLATION \[LF\]](#).)

47. Connect the OCV connector.

48. Install the CMP sensor. (See [CAMSHAFT POSITION \(CMP\) SENSOR REMOVAL/INSTALLATION \[LF\]](#).)

49. Install the front suspension tower bar (joint). (See [FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION](#).)

50. Connect the ventilation hose. (See [QUICK RELEASE CONNECTOR \(EMISSION SYSTEM\) REMOVAL/INSTALLATION \[LF\]](#).)

51. Install the air cleaner. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)

52. Install the plug hole plate. (See [PLUG HOLE PLATE REMOVAL/INSTALLATION \[LF\]](#).)

53. Install the battery and battery tray. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)



## 2008 - MX-5 - Engine

### VALVE CLEARANCE INSPECTION [LF]

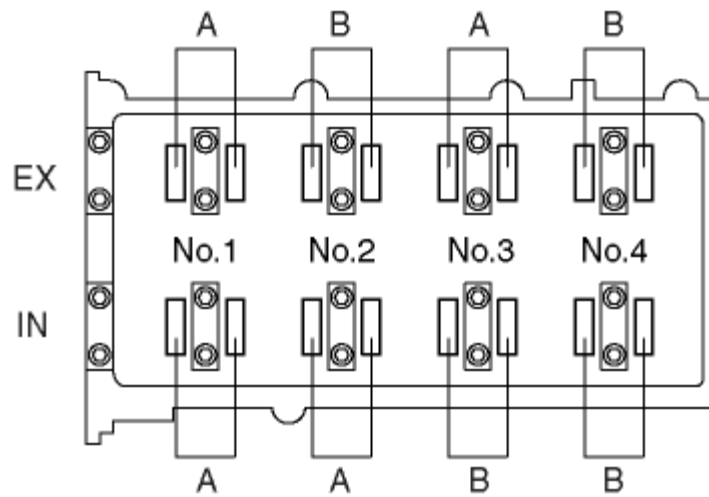
1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the plug hole plate. (See [PLUG HOLE PLATE REMOVAL/INSTALLATION \[LF\]](#).)
4. Disconnect the ventilation hose. (See [QUICK RELEASE CONNECTOR \(EMISSION SYSTEM\) REMOVAL/INSTALLATION \[LF\]](#).)
5. Remove the front suspension tower bar (joint). (See [FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION](#).)
6. Remove the CMP sensor. (See [CAMSHAFT POSITION \(CMP\) SENSOR REMOVAL/INSTALLATION \[LF\]](#).)
7. Disconnect the OCV connector.
8. Disconnect the P/S pressure switch connector.
9. Remove the ignition coils. (See [IGNITION COIL REMOVAL/INSTALLATION \[LF\]](#).)
10. Remove the cylinder head cover. (See [TIMING CHAIN REMOVAL/INSTALLATION \[LF\]](#).)
11. Measure the valve clearance.
  - a. Turn the crankshaft clockwise so that the No.1 piston is at TDC of the compression stroke.
  - b. Measure the valve clearance at A in the figure.
    - If the valve clearance is out of the specification, adjust it. (See [VALVE CLEARANCE ADJUSTMENT \[LF\]](#).)

#### NOTE:

- Make sure to note down the measured values for choosing the suitable replacement tappets.

#### Valve clearance [Engine cold]

- IN: 0.22—0.28 mm {0.0087—0.0110 in}
- EX: 0.27—0.33 mm {0.0107—0.0129 in}



c. Turn the crankshaft **360°** clockwise so that the No.4 piston is at TDC of the compression stroke.

d. Measure the valve clearance at B in the figure.

- If the valve clearance is out of the specification, adjust it. (See [VALVE CLEARANCE ADJUSTMENT \[LF\]](#).)

**NOTE:**

- Make sure to note down the measured values for choosing the suitable replacement tappets.

**Valve clearance [Engine cold]**

- IN: 0.22—0.28 mm {0.0087—0.0110 in}
- EX: 0.27—0.33 mm {0.0107—0.0129 in}

12. Install the cylinder head cover. (See [TIMING CHAIN REMOVAL/INSTALLATION \[LF\]](#).)

13. Install the ignition coils. (See [IGNITION COIL REMOVAL/INSTALLATION \[LF\]](#).)

14. Connect the P/S pressure switch connector.

15. Connect the OCV connector.

16. Install the CMP sensor. (See [CAMSHAFT POSITION \(CMP\) SENSOR REMOVAL/INSTALLATION \[LF\]](#).)

17. Install the front suspension tower bar (joint). (See [FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION](#).)

18. Connect the ventilation hose. (See [QUICK RELEASE CONNECTOR \(EMISSION SYSTEM\) REMOVAL/INSTALLATION \[LF\]](#).)

19. Install the plug hole plate. (See [PLUG HOLE PLATE REMOVAL/INSTALLATION \[LF\]](#).)

20. Connect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)

21. Install the battery cover.



## 2008 - MX-5 - Engine

### VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION [LF]

#### CAUTION:

- Variable valve timing actuator can not be disassembled because it is a precision unit.

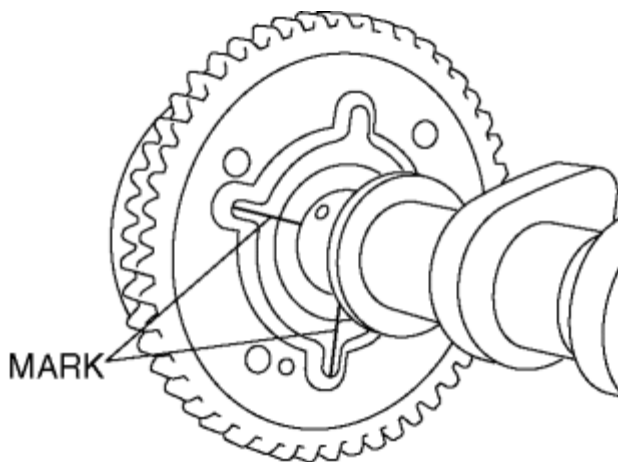
#### NOTE:

- Intake camshaft sprocket is integrated with the variable valve timing actuator and cannot be disassembled.

1. Follow the valve clearance adjustment procedure from 1 to 21 and remove the intake camshaft and variable valve timing actuator as a single unit. (See [VALVE CLEARANCE ADJUSTMENT \[LF\]](#).)

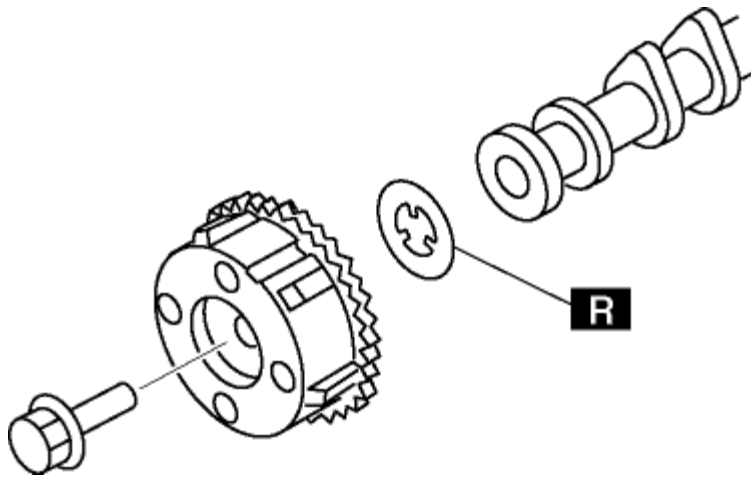
2. Remove the variable valve timing actuator.

- a. Mark the camshaft and variable valve timing actuator as shown in the figure to make sure they are installed in their original position.



- b. Secure the camshaft in a vise.
- c. Loosen the variable valve timing actuator tightening bolt.

3. Install a new washer.



4. Install the variable valve timing actuator.

- a. Secure the camshaft in a vise.
- b. Align the marks of the camshaft and variable valve timing actuator.

**CAUTION:**

- When the variable valve timing actuator is replaced with a new one, mark it in the same location as the old one.
- c. Tighten the variable valve timing actuator tightening bolt.

**Tightening torque**

- 69—75 N·m { 7.1—7.6 kgf·m, 50.9—55.3 ft·lbf }

5. Follow the valve clearance adjustment procedure from 21 to 50 and install the intake camshaft and variable valve timing actuator. (See [VALVE CLEARANCE ADJUSTMENT \[LF\]](#).)

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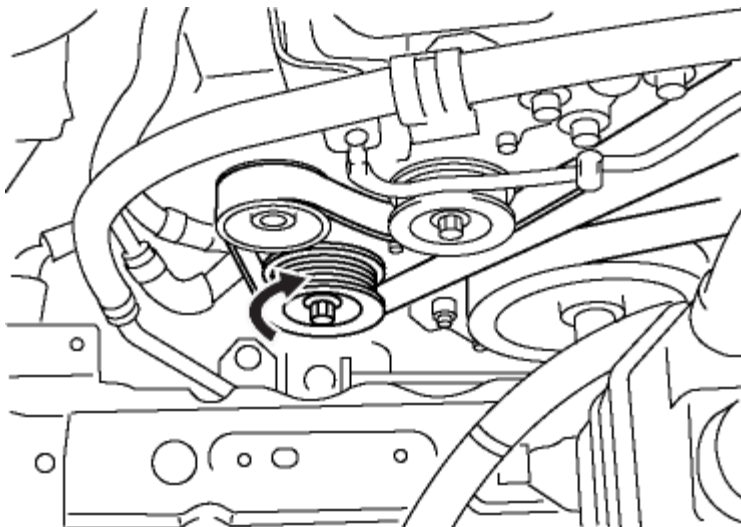
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## 2008 - MX-5 - Engine

### DRIVE BELT REPLACEMENT [LF]

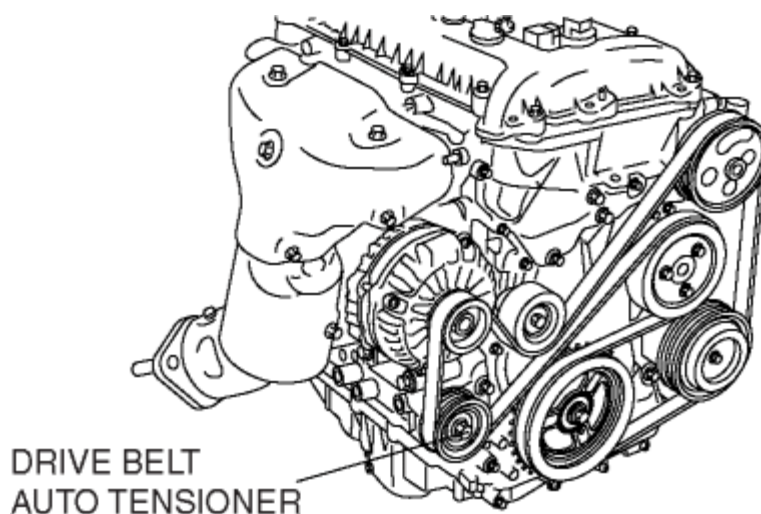
1. Remove the battery and battery tray. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
2. Rotate the drive belt auto tensioner in the direction shown in the figure and remove the drive belt.



3. Install a new drive belt.

#### NOTE:

- Use a mirror to see the position of the drive belt auto tensioner indicator mark.



4. Verify that the drive belt auto tensioner indicator mark does not exceed the limit. (See [DRIVE BELT INSPECTION \[LF\]](#).)
  - If it exceeds the limit, replace the drive belt.
5. Install the battery and battery tray. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)



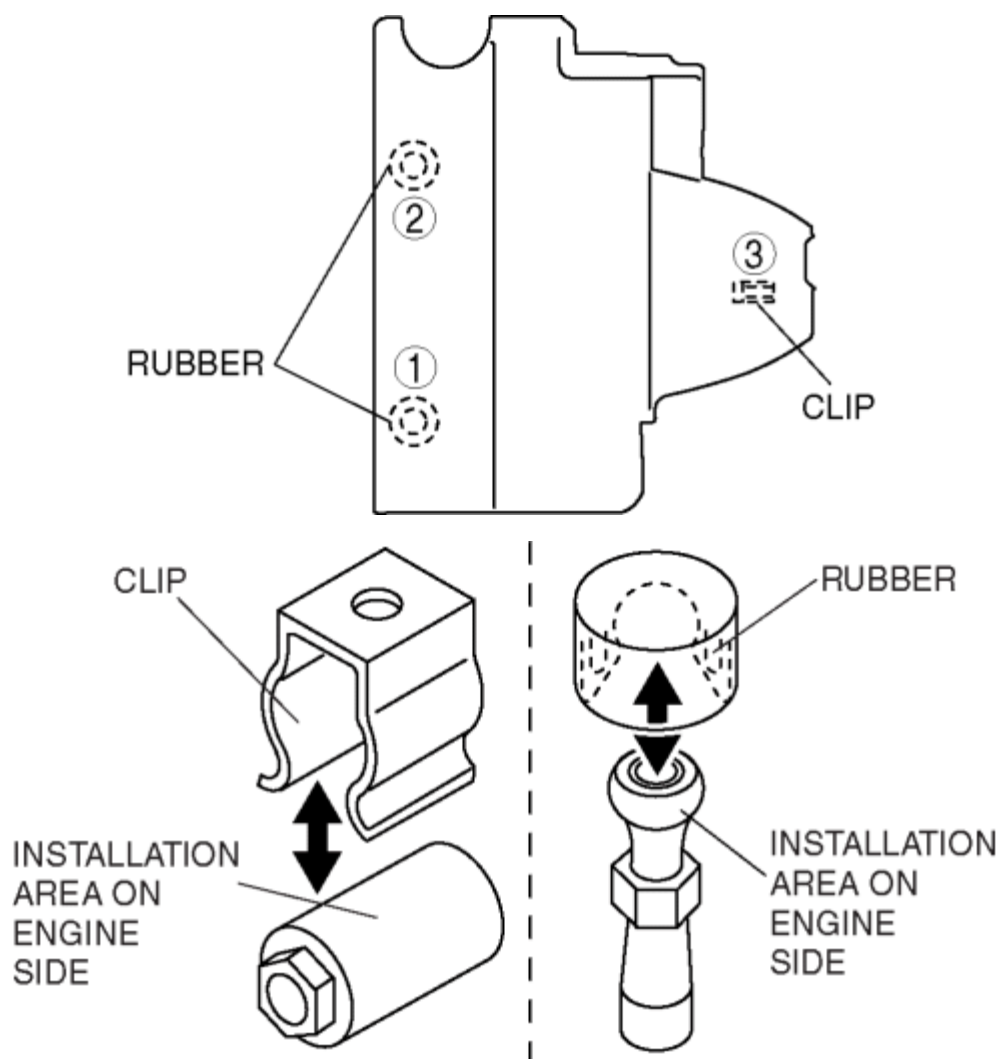
## 2008 - MX-5 - Engine

### PLUG HOLE PLATE REMOVAL/INSTALLATION [LF]

1. Remove the plug hole plate.

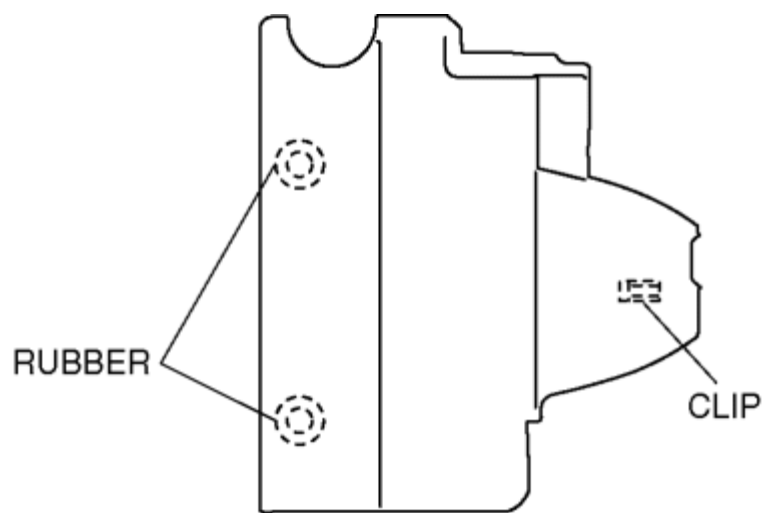
**NOTE:**

- Lift off and remove the plug hole plate from the installation areas (rubber and clips) as shown in the figure.



2. Install the plug hole plate.

- a. To position the plug hole plate, grasp rubber 1 and 2, as shown in the figure, with your hands and press them in.



b. Grasp clips 3 with your hands and press them in.

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1	Oil pressure switch (See <b>OIL PRESSURE INSPECTION [LF].</b> )
2	Oil filter (See <b>OIL FILTER REPLACEMENT [LF].</b> )
3	Oil cooler (See <b>OIL COOLER REMOVAL/INSTALLATION [LF].</b> )
4	Oil pan (See <b>OIL PAN REMOVAL/INSTALLATION [LF].</b> )
5	Oil strainer (See <b>OIL PUMP REMOVAL/INSTALLATION [LF].</b> )

6 Oil pump component

(See [OIL PUMP REMOVAL/INSTALLATION \[LF\].](#))

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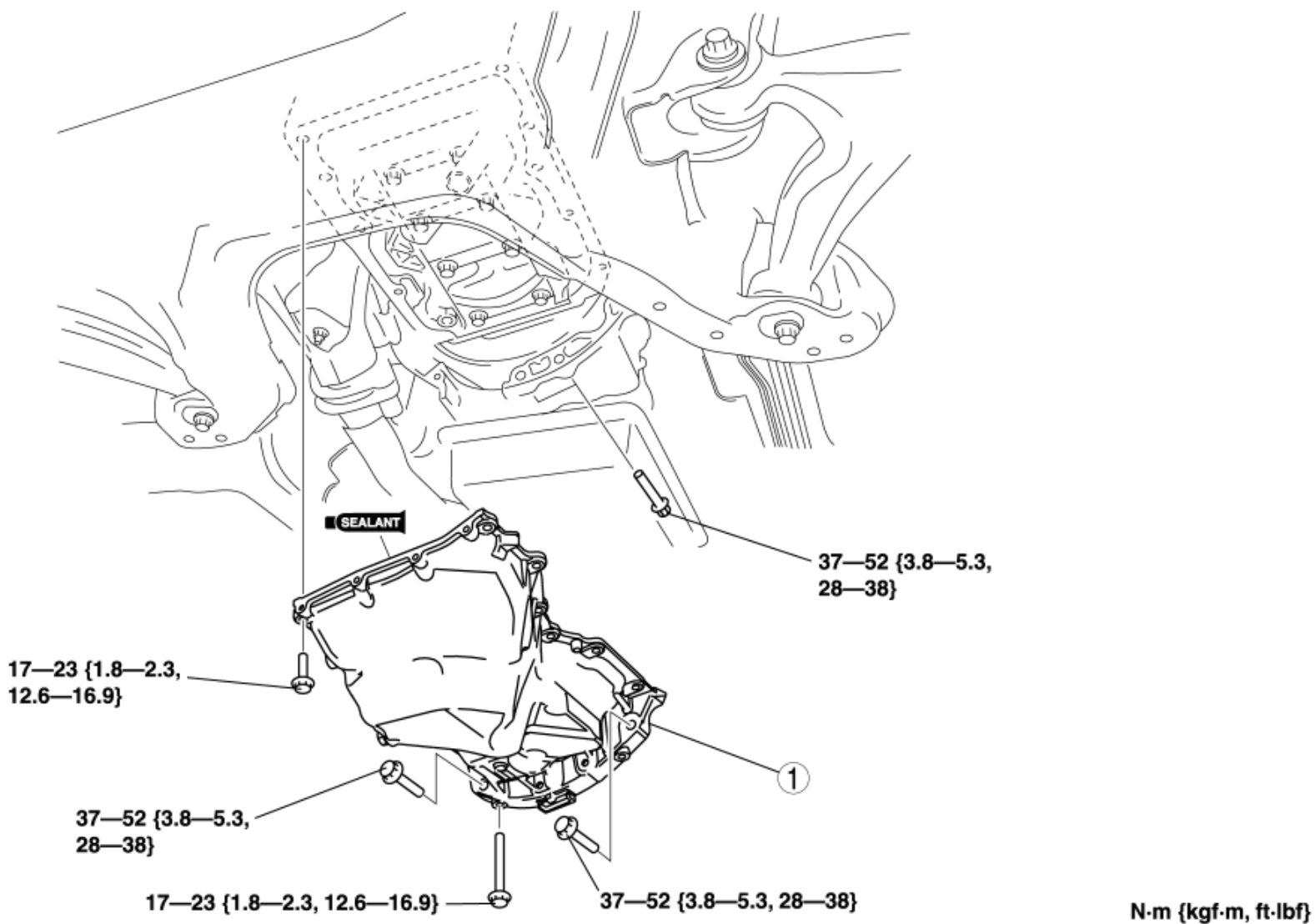
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## 2008 - MX-5 - Engine

### OIL PAN REMOVAL/INSTALLATION [LF]

#### WARNING:

- Hot engine and engine oil can cause severe burns. Turn off the engine and wait until it and the engine oil have cooled.
  - A vehicle that is lifted but not securely supported on safety stands is dangerous. It can slip or fall, causing death or serious injury. Never work around or under a lifted vehicle if it is not securely supported on safety stands.
  - Continuous exposure to USED engine oil has caused skin cancer in laboratory mice. Protect your skin by washing with soap and water immediately after working with engine oil.
1. Remove the battery and battery tray. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
  2. Remove the air cleaner. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
  3. Drain the engine oil. (See [ENGINE OIL REPLACEMENT \[LF\]](#).)
  4. Loosen the water pump pulley bolt and remove the drive belt. (See [DRIVE BELT REPLACEMENT \[LF\]](#).)
  5. Remove the front suspension tower bar (joint, right side, and left side). (See [FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION](#).)
  6. Remove the plug hole plate. (See [PLUG HOLE PLATE REMOVAL/INSTALLATION \[LF\]](#).)
  7. Remove the ignition coils. (See [IGNITION COIL REMOVAL/INSTALLATION \[LF\]](#).)
  8. Remove the P/S oil pump with the hose and pipe still connected. Position the P/S oil pump out of the way. (See [POWER STEERING OIL PUMP REMOVAL/INSTALLATION](#).)
  9. Remove the crankshaft position (CKP) sensor. (See [CRANKSHAFT POSITION \(CKP\) SENSOR REMOVAL/INSTALLATION \[LF\]](#).)
  10. Remove the engine front cover. (See [TIMING CHAIN REMOVAL/INSTALLATION \[LF\]](#).)
  11. Remove the transverse member. (See [TRANSVERSE MEMBER REMOVAL/INSTALLATION](#).)
  12. Remove the member bracket. (MT) (See [TRANSMISSION REMOVAL/INSTALLATION \[M15M-D\]](#).) (See [TRANSMISSION REMOVAL/INSTALLATION \[P66M-D\]](#).)
  13. Remove in the order indicated in the table.
  14. Install in the reverse order of removal.
  15. Refill the specified type and amount of the engine oil. (See [ENGINE OIL REPLACEMENT \[LF\]](#).)
  16. Start the engine and confirm that there is no oil leakage.
    - If there is oil leakage, repair or replace the applicable part.
  17. Inspect the oil level. (See [ENGINE OIL LEVEL INSPECTION \[LF\]](#).)
  18. Inspect for the ignition timing and idle speed. (See [ENGINE TUNE-UP \[LF\]](#).)



1 Oil pan

(See [OIL PAN REMOVAL/INSTALLATION \[LF\]](#).)

(See [OIL PAN REMOVAL/INSTALLATION \[LF\]](#).)

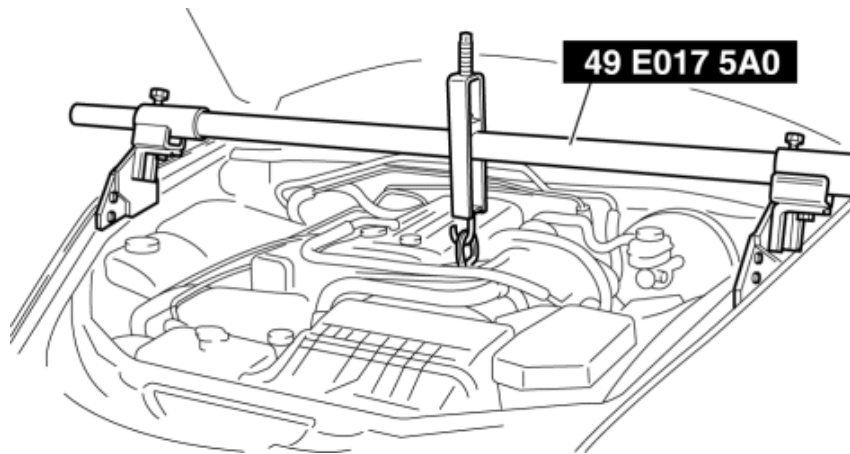
## Oil Pan Removal Note

### NOTE:

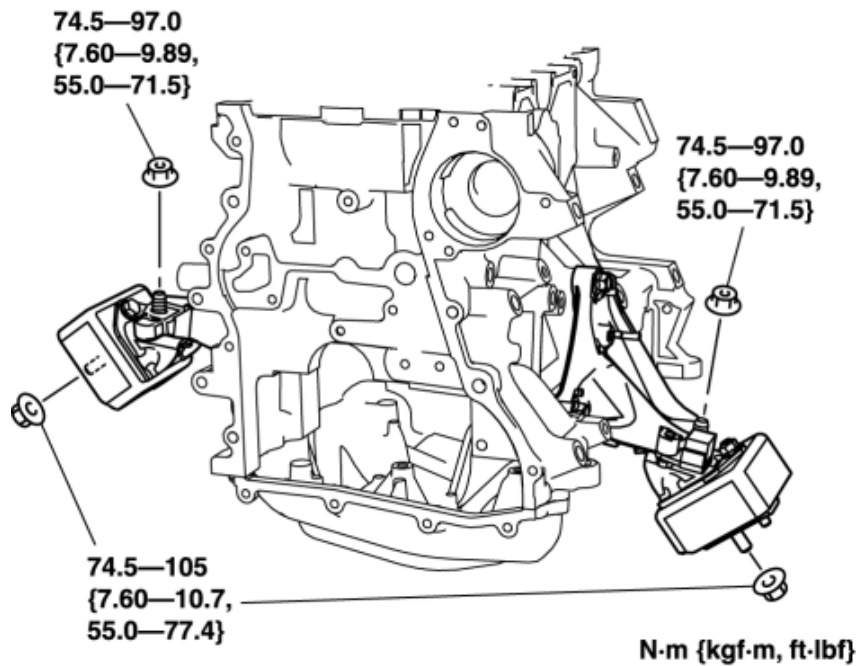
- Lift up the engine **approx. 25 mm {0.98 in}** to assure clearance for the oil pan removal, then remove the oil pan.
1. Remove the windshield wiper arm. (See [WIPER ARM AND BLADE REMOVAL/INSTALLATION](#).)
  2. Remove the cowl grille. (See [COWL GRILLE REMOVAL/INSTALLATION](#).)
  3. Remove the side cowl grille. (See [SIDE COWL GRILLE REMOVAL/INSTALLATION](#).)
  4. Remove the engine compartment service hole cover. (See [EGR VALVE REMOVAL/INSTALLATION \[LF\]](#).)
  5. Remove the front tires.



6. Support the engine using the **SST**.



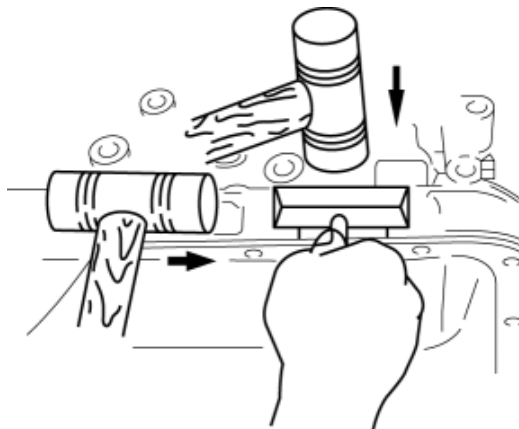
7. Remove the engine mount rubber installation nuts.



8. Lift up the engine **approx. 25 mm {0.98 in}** using the **SST**.

9. Remove the oil pan installation bolts.

10. Remove the oil pan using the separator tool.

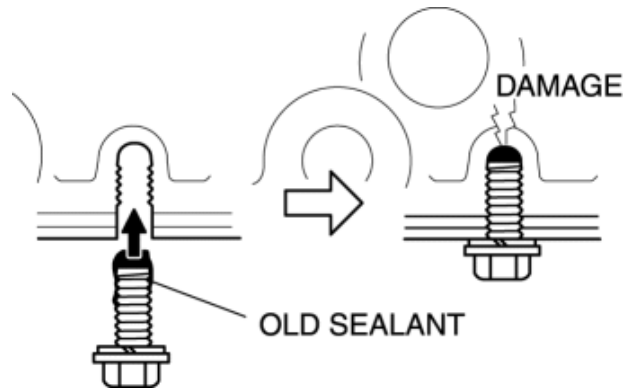


11. Remove the oil pan.

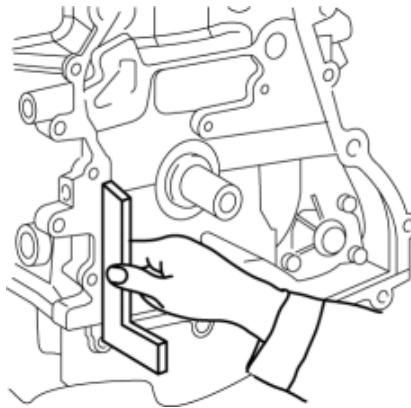
## Oil Pan Installation Note

### CAUTION:

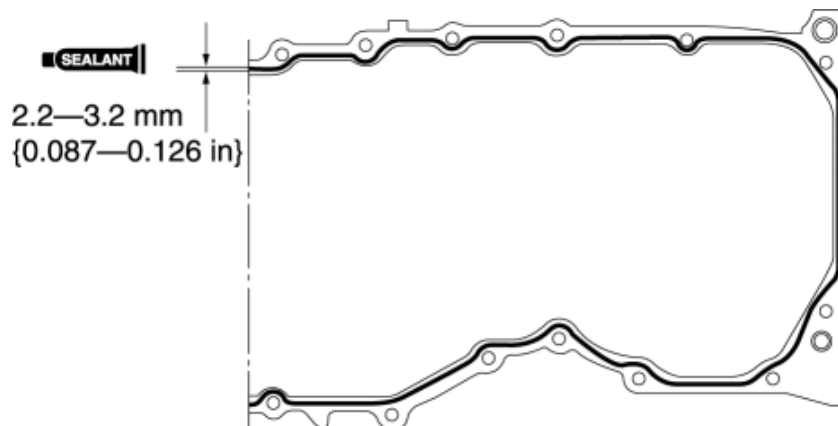
- Apply the silicon sealant in a single, unbroken line around the whole perimeter.
- Using bolts with the old seal adhering could cause cracks in the housing.



1. Completely clean and remove any oil, dirt, sealant or other foreign material that may be adhering to the housing and oil pan.
2. When reusing the oil pan installation bolts, clean any old sealant from the bolts.
3. Use a square ruler to align the oil pan and the cylinder block junction side on the engine front cover side.



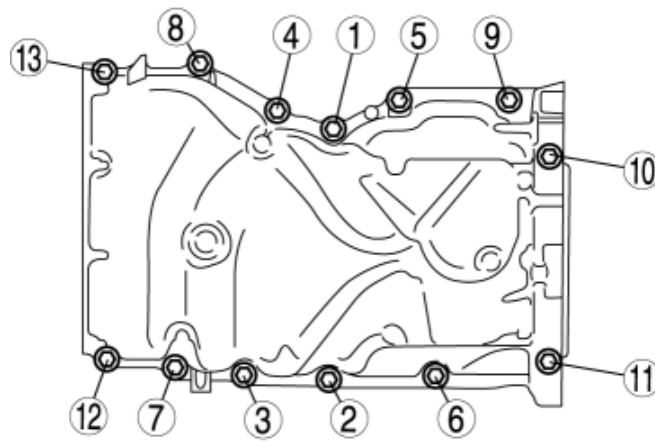
4. Apply silicone sealant to the oil pan along the inside of the bolt holes as shown in the figure.



1. Thickness

2.2—3.2 mm {0.087—0.126 in}

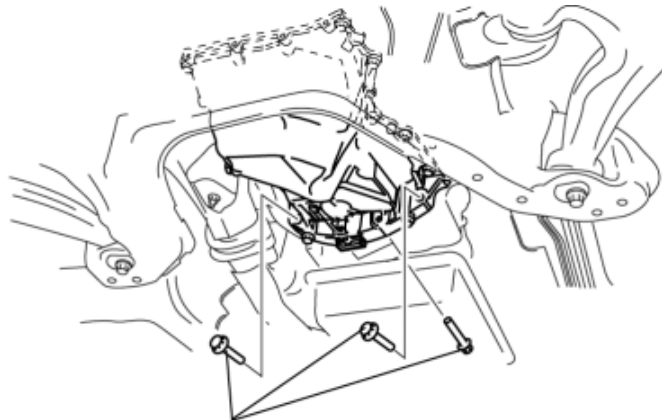
5. Tighten the bolts in the order shown in the figure.



1. Tightening torque

17—23 N·m { 1.8—2.3 kgf·m, 12.6—16.9 ft·lbf }

6. Tighten the oil pan-transmission installation bolts.



#### OIL PAN-TRANSMISSION INSTALLATION BOLTS

1. Tightening torque

37—52 N·m { 3.8—5.3 kgf·m, 28—38 ft·lbf }

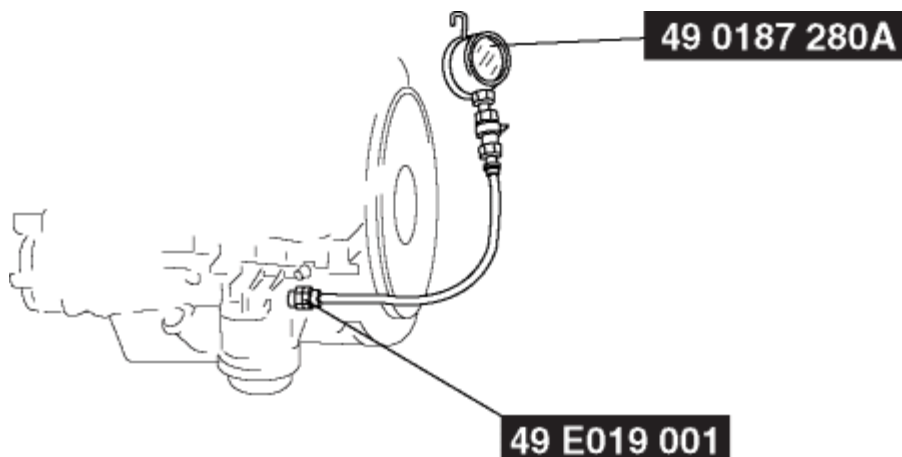
## 2008 - MX-5 - Engine

### OIL PRESSURE INSPECTION [LF]

#### WARNING:

- Hot engine and engine oil can cause severe burns. Turn off the engine and wait until it and the engine oil have cooled.
- A vehicle that is lifted but not securely supported on safety stands is dangerous. It can slip or fall, causing death or serious injury. Never work around or under a lifted vehicle if it is not securely supported on safety stands.
- Continuous exposure to USED engine oil has caused skin cancer in laboratory mice. Protect your skin by washing with soap and water immediately after working with engine oil.

1. Remove the battery cover.
2. Disconnect the negative battery cable.
3. Remove the oil pressure switch.
4. Screw the **SSTs** into the oil pressure switch installation hole.



5. Connect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
6. Warm up the engine to normal operating temperature.
7. Run the engine at the specified speed, and note the gauge readings.
  - If not within the specification, inspect for the cause and repair or replace if necessary.

#### NOTE:

- The oil pressure can vary with oil viscosity and temperature.

**Oil pressure (reference value) [oil temperature: 100 °C {212 °F}]**

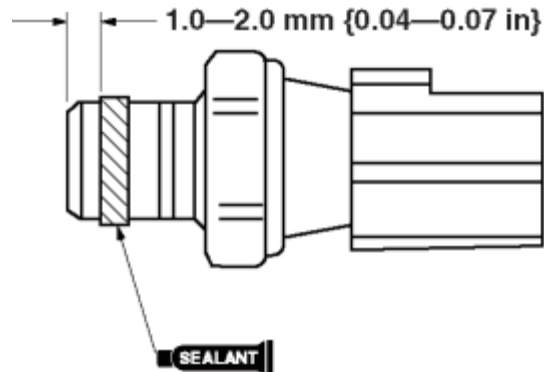
- 337—591 kPa {3.44—6.03 kgf/cm<sup>2</sup>, 49.0—85.8 psi} min [3,000 rpm]

8. Stop the engine and wait until it is cool.
9. Disconnect the negative battery cable.
10. Remove the **SSTs**.

**CAUTION:**

- Make sure that there is no sealant between 1.0—2.0 mm {0.04—0.07 in} from the end of the oil pressure switch to prevent a possible operation malfunction.

11. Apply silicone sealant to the oil pressure switch threads as shown in the figure.



12. Install the oil pressure switch.

**Tightening torque**

- 12—18 N·m {1.3—1.8 kgf·m, 9—13 ft·lbf}

13. Connect the negative battery cable. (See **BATTERY REMOVAL/INSTALLATION [LF]**.)
14. Install the battery cover.
15. Start the engine and confirm that there is no oil leakage.

- If there is oil leakage, repair or replace the applicable part.

## 2008 - MX-5 - Engine

### ENGINE OIL REPLACEMENT [LF]

**WARNING:**

- Hot engine and engine oil can cause severe burns. Turn off the engine and wait until it and the engine oil have cooled.
- A vehicle that is lifted but not securely supported on safety stands is dangerous. It can slip or fall, causing death or serious injury. Never work around or under a lifted vehicle if it is not securely supported on safety stands.
- Continuous exposure to USED engine oil has caused skin cancer in laboratory mice. Protect your skin by washing with soap and water immediately after working with engine oil.

**CAUTION:**

- In case you spill engine oil on the exhaust system, wipe it off completely. If you fail to wipe the spilled engine oil, it will produce fumes because of the heat.

1. Position the vehicle on level ground.
2. Remove the oil filler cap.
3. Remove the oil pan drain plug.
4. Drain the engine oil into a container.
5. Install the oil pan drain plug with a new washer.

**Oil pan drain plug tightening torque**

- 30—41 N·m { 3.1—4.1 kgf·m, 23—30 ft·lbf }

**NOTE:**




- The amount of residual oil in the engine can vary according to factors such as the replacement method and oil temperature. Verify the oil level after engine oil replacement.
6. Refill the following type and amount of the engine oil.

**NOTE:**

- The maintenance intervals on scheduled maintenance table (See **SCHEDULED MAINTENANCE**) can only be supported with the use of the following oils.

**Engine oil specification**

Item	U.S.A. and CANADA	Except U.S.A. and CANADA

Engine oil grade		 
		API SM or ILSAC
Engine oil viscosity	5W-20	5W-20 (If SAE 5W-20 engine oil is not available in your market, use SAE 5W-30 engine oil.)

#### **Engine oil capacity (approx. quantity) (AT, 5MT)**

- Oil replacement: 4.05 L {4.28 US qt, 3.56 Imp qt}
- Oil and oil filter replacement: 4.45 L {4.70 US qt, 3.92 Imp qt}
- Total (dry engine): 4.75 L {5.02 US qt, 4.18 Imp qt}

#### **Engine oil capacity (approx. quantity) (6MT)**

- Oil replacement: 4.05 L {4.28 US qt, 3.56 Imp qt}
- Oil and oil filter replacement: 4.55 L {4.81 US qt, 4.00 Imp qt}
- Total (dry engine): 4.85 L {5.12 US qt, 4.27 Imp qt}

7. Install the oil filler cap.

8. Start the engine and confirm that there is no oil leakage.

- If there is oil leakage, repair or replace the applicable part.

9. Inspect the oil level. (See [ENGINE OIL LEVEL INSPECTION \[LF\]](#).)

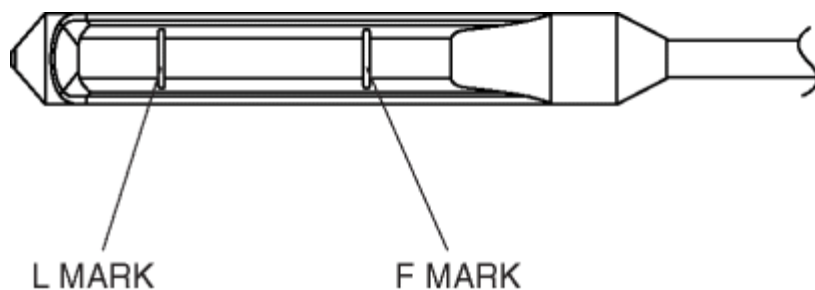
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## 2008 - MX-5 - Engine

### ENGINE OIL LEVEL INSPECTION [LF]

1. Position the vehicle on level ground.
2. Warm up the engine.
3. Stop the engine and allow **approx. 5 min.** before continuing.
4. Remove the dipstick and verify that the oil level is between the F and L marks on the dipstick.
  - If the oil level is below the L mark, add engine oil.





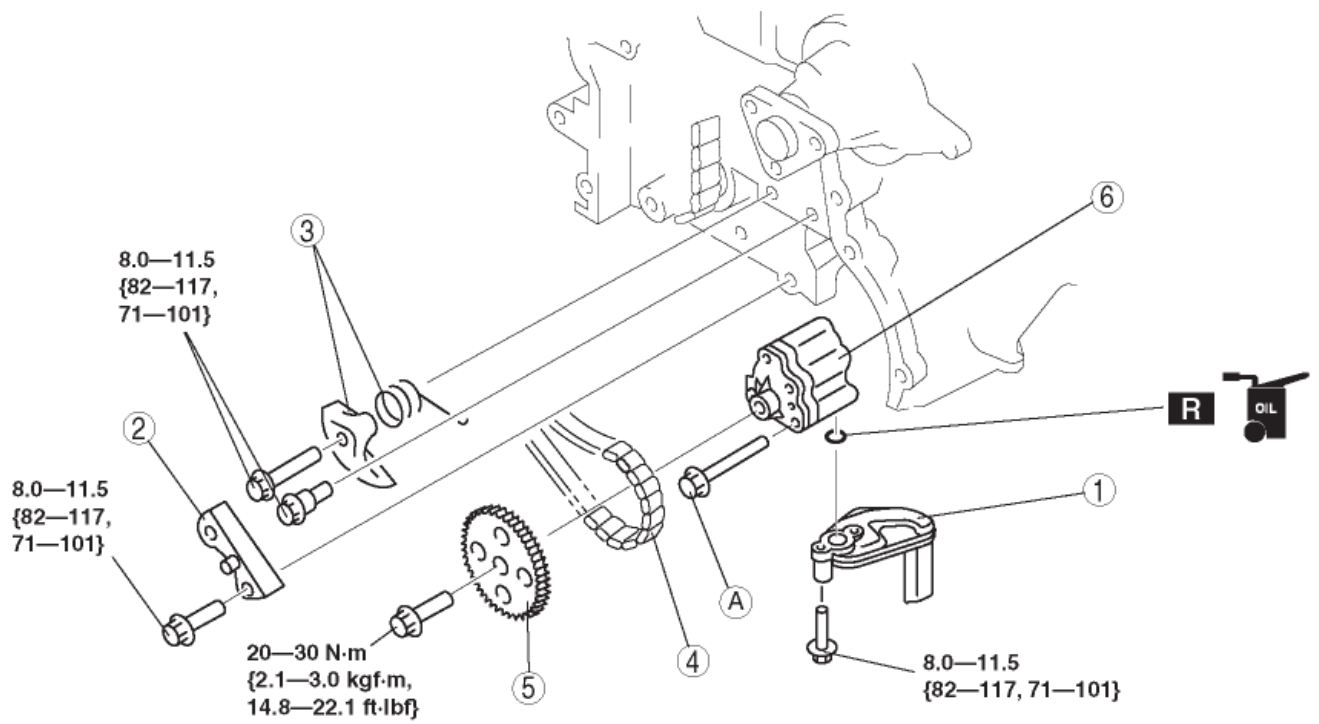
## 2008 - MX-5 - Engine

### OIL PUMP REMOVAL/INSTALLATION [LF]

#### WARNING:

- Hot engine and engine oil can cause severe burns. Turn off the engine and wait until it and the engine oil have cooled.
- A vehicle that is lifted but not securely supported on safety stands is dangerous. It can slip or fall, causing death or serious injury. Never work around or under a lifted vehicle if it is not securely supported on safety stands.
- Continuous exposure to USED engine oil has caused skin cancer in laboratory mice. Protect your skin by washing with soap and water immediately after working with engine oil.

1. Remove the battery and battery tray. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
2. Remove the air cleaner. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
3. Drain the engine oil. (See [ENGINE OIL REPLACEMENT \[LF\]](#).)
4. Loosen the water pump pulley bolt and remove the drive belt. (See [DRIVE BELT REPLACEMENT \[LF\]](#).)
5. Remove the front suspension tower bar (joint, right side, and left side). (See [FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION](#).)
6. Remove the plug hole plate. (See [PLUG HOLE PLATE REMOVAL/INSTALLATION \[LF\]](#).)
7. Remove the ignition coils. (See [IGNITION COIL REMOVAL/INSTALLATION \[LF\]](#).)
8. Remove the P/S oil pump with the hose and pipe still connected. Position the P/S oil pump out of the way. (See [POWER STEERING OIL PUMP REMOVAL/INSTALLATION](#).)
9. Remove the crankshaft position (CKP) sensor. (See [CRANKSHAFT POSITION \(CKP\) SENSOR REMOVAL/INSTALLATION \[LF\]](#).)
10. Remove the engine front cover. (See [TIMING CHAIN REMOVAL/INSTALLATION \[LF\]](#).)
11. Remove the transverse member. (See [TRANSVERSE MEMBER REMOVAL/INSTALLATION](#).)
12. Remove the member bracket. (MT) (See [TRANSMISSION REMOVAL/INSTALLATION \[M15M-D\]](#).) (See [TRANSMISSION REMOVAL/INSTALLATION \[P66M-D\]](#).)
13. Remove the oil pan. (See [OIL PAN REMOVAL/INSTALLATION \[LF\]](#).)
14. Remove in the order indicated in the table.
15. Install in the reverse order of removal.
16. Refill the specified type and amount of the engine oil. (See [ENGINE OIL REPLACEMENT \[LF\]](#).)
17. Start the engine and confirm that there is no oil leakage.
  - If there is oil leakage, repair or replace the applicable part.
18. Inspect the oil level. (See [ENGINE OIL LEVEL INSPECTION \[LF\]](#).)
19. Inspect for the ignition timing and idle speed. (See [ENGINE TUNE-UP \[LF\]](#).)
20. Inspect the oil pressure. (See [OIL PRESSURE INSPECTION \[LF\]](#).)

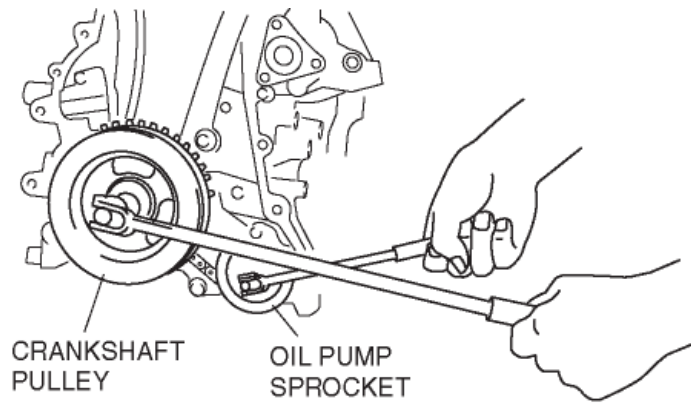


N·m {kgf·cm, in·lbf}

1	Oil strainer
2	Oil pump chain guide
3	Oil pump chain tensioner
4	Oil pump chain
5	Oil pump sprocket (See <a href="#">OIL PUMP REMOVAL/INSTALLATION [LF]</a> .)
6	Oil pump (See <a href="#">OIL PUMP REMOVAL/INSTALLATION [LF]</a> .)

### Oil Pump Sprocket Removal/Installation Note

1. Temporarily install the crankshaft pulley and crankshaft pulley lock bolt to the crankshaft, and lock the oil pump against rotation as shown in figure.



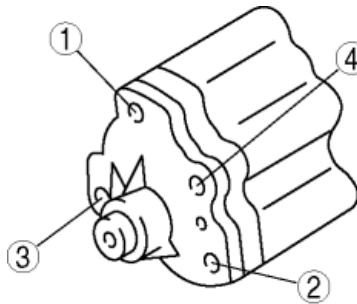
2. Remove/install the oil pump sprocket, and then remove the crankshaft pulley and crankshaft pulley lock bolt.

#### **Tightening torque**

- 20—30 N·m {2.1—3.0 kgf·m, 14.8—22.1 ft·lbf}

#### **Oil Pump Installation Note**

1. Tighten the oil pump bolts in two steps in the order shown in the figure.



#### **Tightening torque**

1. Step 1: 8—12 N·m {82—122 kgf·cm, 71—105 in·lbf}
2. Step 2: 17—23 N·m {1.8—2.3 kgf·m, 12.6—16.9 ft·lbf}

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## 2008 - MX-5 - Engine

### OIL FILTER REPLACEMENT [LF]

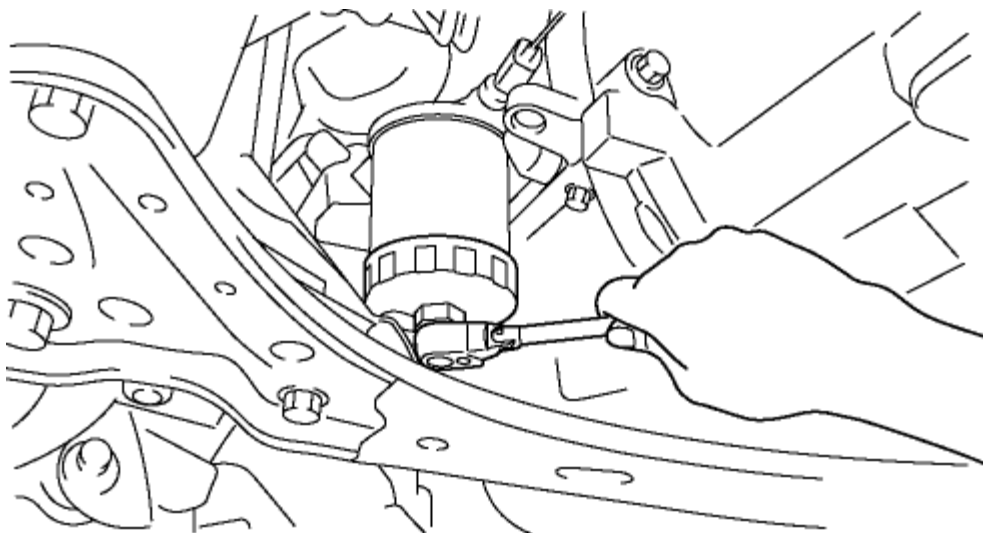
#### WARNING:

- Hot engine and engine oil can cause severe burns. Turn off the engine and wait until it and the engine oil have cooled.
- A vehicle that is lifted but not securely supported on safety stands is dangerous. It can slip or fall, causing death or serious injury. Never work around or under a lifted vehicle if it is not securely supported on safety stands.
- Continuous exposure to USED engine oil has caused skin cancer in laboratory mice. Protect your skin by washing with soap and water immediately after working with engine oil.

#### CAUTION:

- In case you spill engine oil on the exhaust system, wipe it off completely. If you fail to wipe the spilled engine oil, it will produce fumes because of the heat.

1. Remove the oil filter using a commercially available, cup-type oil filter wrench (**76 mm {3.0 in} diameter, 15 sided**).



2. Use a clean rag to wipe off the mounting surface.
3. Apply clean engine oil to the gasket of a new oil filter.
4. Tighten the oil filter using a cup-type oil filter wrench and according to the instruction on the package or side of the oil filter.

#### **Tightening torque (reference value)**

- 15—20 N·m {1.6—2.0 kgf·m, 11—14 ft·lbf}
5. Start the engine and confirm that there is no oil leakage.
    - If there is oil leakage, repair or replace the applicable part.

6. Inspect the oil level. (See [ENGINE OIL LEVEL INSPECTION \[LF\]](#).)

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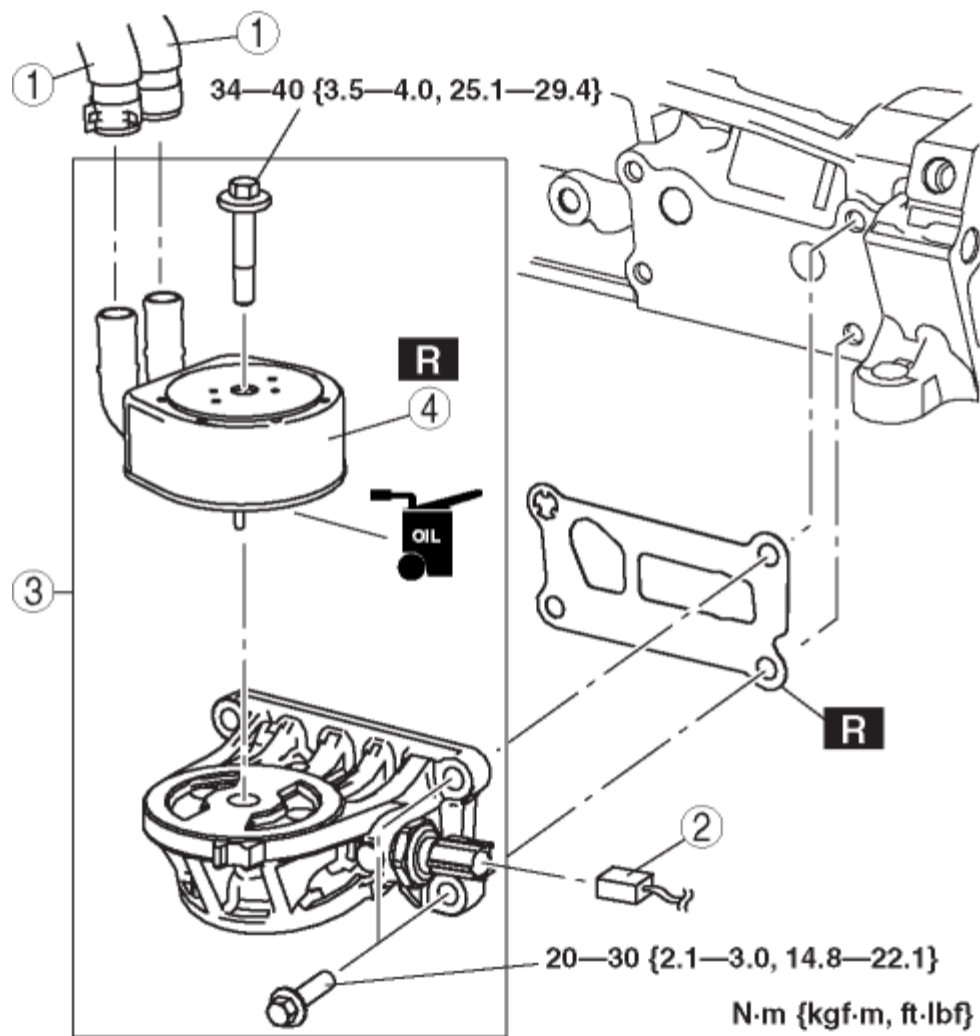
## 2008 - MX-5 - Engine

### OIL COOLER REMOVAL/INSTALLATION [LF]

#### WARNING:

- Hot engine and engine oil can cause severe burns. Turn off the engine and wait until it and the engine oil have cooled.
- A vehicle that is lifted but not securely supported on safety stands is dangerous. It can slip or fall, causing death or serious injury. Never work around or under a lifted vehicle if it is not securely supported on safety stands.
- Continuous exposure to USED engine oil has caused skin cancer in laboratory mice. Protect your skin by washing with soap and water immediately after working with engine oil.

1. Remove the battery cover.
2. Disconnect the negative battery cable.
3. Drain the engine coolant. (See [ENGINE COOLANT REPLACEMENT \[LF\]](#).)
4. Remove the under cover. (See [TRANSVERSE MEMBER REMOVAL/INSTALLATION](#).)
5. Remove the under guard. (LF engine MT models) (See [TRANSMISSION REMOVAL/INSTALLATION \[P66M-D\]](#).) (See [TRANSMISSION REMOVAL/INSTALLATION \[M15M-D\]](#).)
6. Remove the side cover. (LH)
7. Remove the oil filter. (See [OIL FILTER REPLACEMENT \[LF\]](#).)
8. Remove in the order indicated in the table.
9. Use a clean rag to wipe off the mounting surface on the oil filter adapter and the oil cooler.
10. Install in the reverse order of the removal.
11. Refill the engine coolant. (See [ENGINE COOLANT REPLACEMENT \[LF\]](#).)
12. Start the engine and confirm that there is no oil leakage.
  - If there is oil leakage, repair or replace the applicable part.
13. Inspect the oil level. (See [ENGINE OIL LEVEL INSPECTION \[LF\]](#).)



1	Water hose
2	Oil pressure switch connector
3	Oil cooler and oil filter adapter component
4	Oil cooler (See <a href="#">Oil Cooler Removal Note</a> .)

### Oil Cooler Removal Note

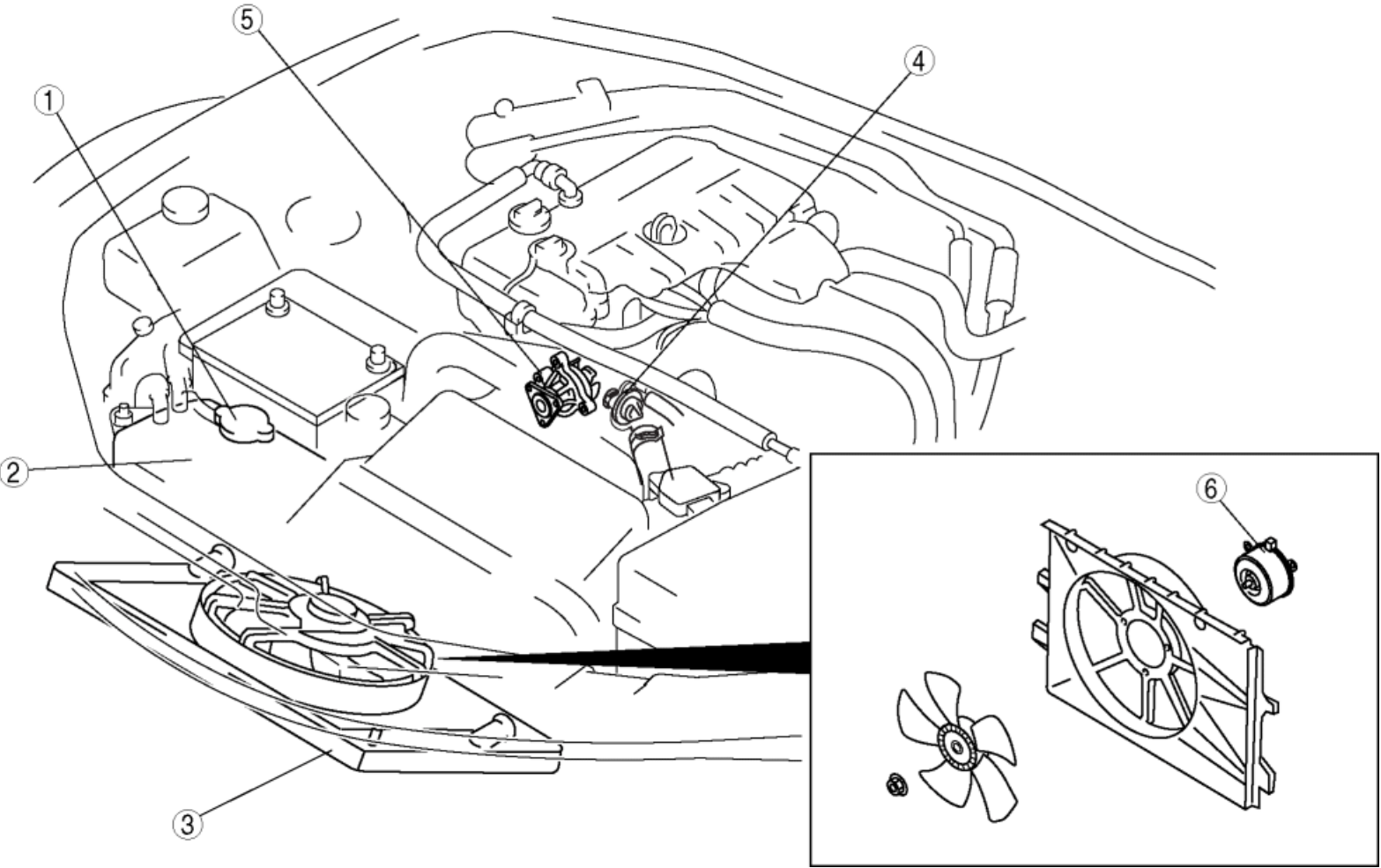
1. Secure the oil cooler and oil filter adapter component in a vise.
2. Loosen the oil cooler fitting bolt.
3. Remove the oil cooler.





2008 - MX-5 - Engine

COOLING SYSTEM LOCATION INDEX [LF]



1	Cooling system cap (See <a href="#">COOLING SYSTEM CAP INSPECTION [LF].</a> )
2	Coolant reserve tank (See <a href="#">COOLANT RESERVE TANK REMOVAL/INSTALLATION [LF].</a> )
3	Radiator (See <a href="#">RADIATOR REMOVAL/INSTALLATION [LF].</a> )
4	Thermostat (See <a href="#">THERMOSTAT REMOVAL/INSTALLATION [LF].</a> ) (See <a href="#">THERMOSTAT INSPECTION [LF].</a> )
5	Water pump (See <a href="#">WATER PUMP REMOVAL/INSTALLATION [LF].</a> )

6Cooling fan motor

(See [COOLING FAN COMPONENT REMOVAL/INSTALLATION \[LF\]](#).)

(See [FAN MOTOR INSPECTION \[LF\]](#).)

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## 2008 - MX-5 - Engine

### COOLING SYSTEM SERVICE WARNINGS [LF]

#### WARNING:

- Depending on the vehicle, the cooling fan may operate suddenly even when the ignition switch is turned off. Therefore, keep hands and tools away from the cooling fan even if the cooling fan is not operating to prevent an accident or damage to the cooling fan. Always disconnect the negative battery cable when servicing the cooling fan or parts near the cooling fan.
- Never remove the cooling system cap or loosen the radiator drain plug while the engine is running, or when the engine and radiator are hot. Scalding engine coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.
- Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise to the first stop. Step back while the pressure escapes.
- When you are sure all the pressure is gone, press down on the cap using the cloth, turn it, and remove it.

## 2008 - MX-5 - Engine

### ENGINE COOLANT LEVEL INSPECTION [LF]

#### WARNING:

- Never remove the cooling system cap or loosen the radiator drain plug while the engine is running, or when the engine and radiator are hot. Scalding engine coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.
- Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise to the first stop. Step back while the pressure escapes.
- When you are sure all the pressure is gone, press down on the cap using the cloth, turn it, and remove it.

#### NOTE:

- If the "FL22" mark is shown on or near the cooling system cap, use FL22 type engine coolant.
- FL22 type engine coolant is shipped as a diluted solution (55% coolant, 45% water). Use the solution as is when replacing coolant.



1. Verify that the engine coolant level in the coolant reserve tank is between the L and F marks.
2. If the engine coolant level is below L mark, add engine coolant.

## 2008 - MX-5 - Engine

### ENGINE COOLANT PROTECTION INSPECTION [LF]

1. Measure the coolant temperature and specific gravity using a thermometer and a hydrometer.

#### CAUTION:

1. Use engine coolant at a concentration that meets the environmental conditions in which the vehicle is driven, otherwise engine damage could occur.
2. The engine has aluminum parts and must be protected by an ethylene-glycol-based coolant to prevent corrosion and freezing.
3. Do not use coolants containing Alcohol, Methanol, Borate or Silicate. These coolants could damage the cooling system.
4. Use only soft (demineralized) water in the coolant mixture. Water that contains minerals will cut down on the coolant's effectiveness.
5. Engine coolant damages paint. If engine coolant does get on a painted surface, rinse it off quickly.

#### NOTE:

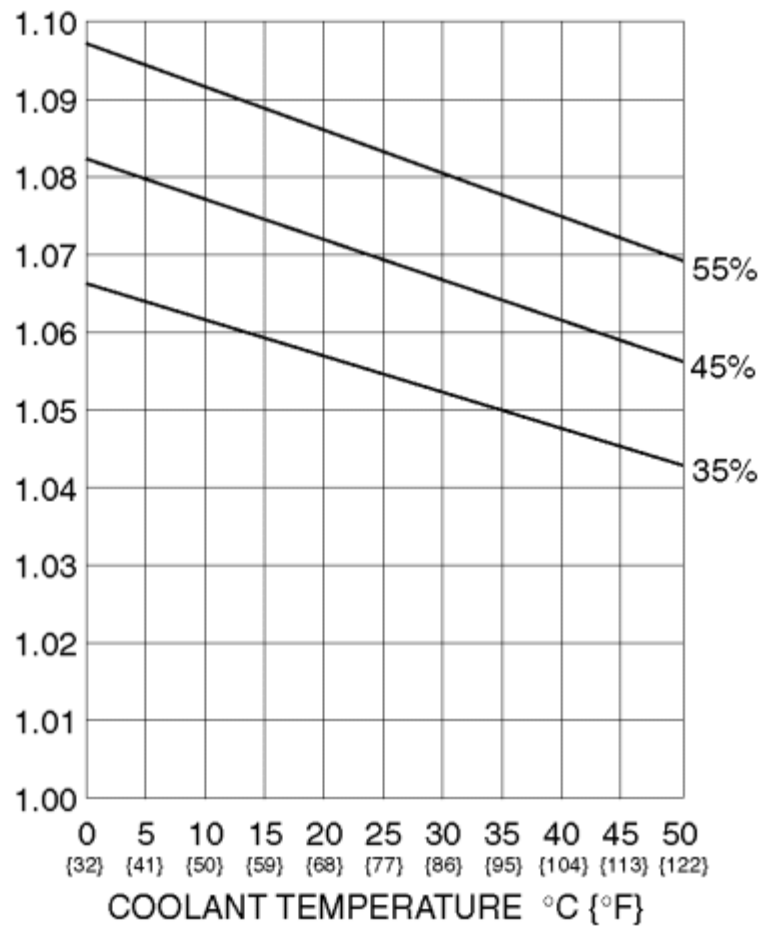
- If the "FL22" mark is shown on or near the cooling system cap, use FL22 type engine coolant.
- FL22 type engine coolant is shipped as a diluted solution (55% coolant, 45% water). Use the solution as is when replacing coolant.



2. Determine the coolant protection level by referring to the graph shown.

- If the coolant protection level is not correct, add water or coolant.

**SPECIFIC GRAVITY**      **COOLANT PROTECTION**  
**(EXCEPT FL22 TYPE ENGINE COOLANT)**



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## 2008 - MX-5 - Engine

### ENGINE COOLANT LEAKAGE INSPECTION [LF]

#### WARNING:

- Never remove the cooling system cap or loosen the radiator drain plug while the engine is running, or when the engine and radiator are hot. Scalding engine coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.
- Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise to the first stop. Step back while the pressure escapes.
- When you are sure all the pressure is gone, press down on the cap using the cloth, turn it, and remove it.

1. Inspect the engine coolant level. (See [ENGINE COOLANT LEVEL INSPECTION \[LF\]](#).)
2. Remove the cooling system cap.
3. Clean the installation parts of the cooling system cap.
4. Install the **SST** and a radiator cap tester to the coolant reserve tank filler port.



5. Apply pressure using the radiator cap tester.

#### CAUTION:

- Applying more than 122.6 kPa {1.25 kgf/cm<sup>2</sup>, 17.8 psi} can damage the hoses, fittings, and other components, and cause leakage.

#### Pressure

- 122.6 kPa {1.25 kgf/cm<sup>2</sup>, 17.8 psi} [1 min]
6. When pressurizing the cooling system, verify that the pressure is maintained.
    - If the gauge needle drops, it may indicate water leakage. Repair or replace the applicable part.





## 2008 - MX-5 - Engine

### ENGINE COOLANT REPLACEMENT [LF]

#### WARNING:

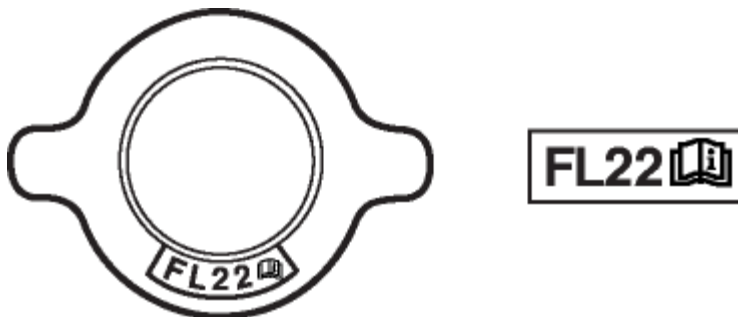
- Never remove the cooling system cap or loosen the radiator drain plug while the engine is running, or when the engine and radiator are hot. Scalding engine coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.
- Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise to the first stop. Step back while the pressure escapes.
- When you are sure all the pressure is gone, press down on the cap using the cloth, turn it, and remove it.

#### CAUTION:

1. Use engine coolant at a concentration that meets the environmental conditions in which the vehicle is driven, otherwise engine damage could occur.
2. The engine has aluminum parts and must be protected by an ethylene-glycol-based coolant to prevent corrosion and freezing.
3. Do not use coolants containing Alcohol, Methanol, Borate or Silicate. These coolants could damage the cooling system.
4. Use only soft (demineralized) water in the coolant mixture. Water that contains minerals will cut down on the coolant's effectiveness.
5. Engine coolant damages paint. If engine coolant does get on a painted surface, rinse it off quickly.

#### NOTE:

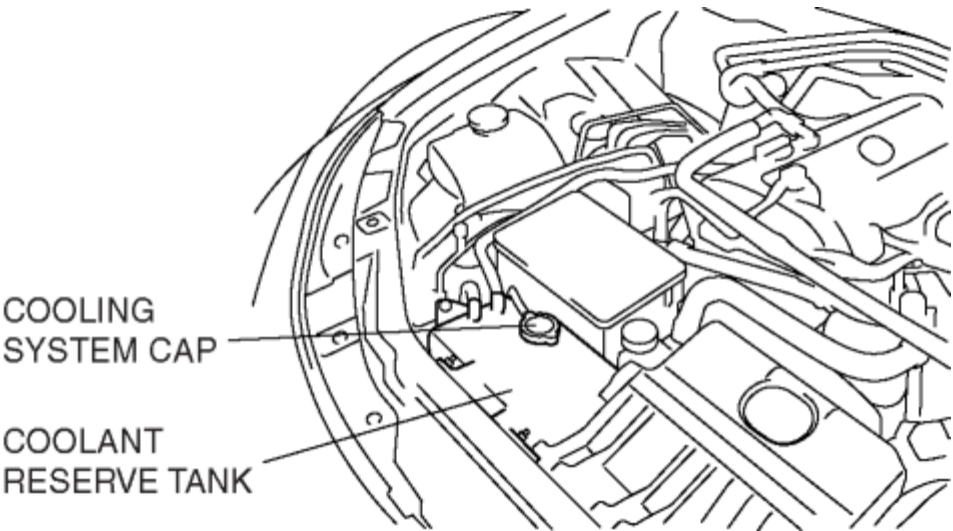
- If the "FL22" mark is shown on or near the cooling system cap, use FL22 type engine coolant.
- FL22 type engine coolant is shipped as a diluted solution (55% coolant, 45% water). Use the solution as is when replacing coolant.



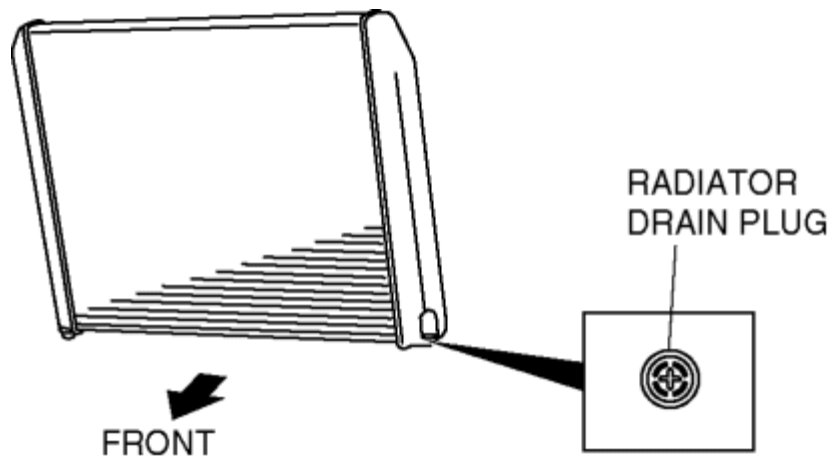
**Engine coolant capacity (approx. quantity)**

7.5 L {7.9 US qt, 6.6 Imp qt}

1. Remove the cooling system cap.



2. Remove the radiator drain plug and drain the engine coolant into a container.



3. Flush the cooling system with water until all traces of color are gone.

4. Let the system drain completely.

5. Tighten the radiator drain plug.

**Tightening torque**

- 0.8—1.5 N·m {8—15 kgf·cm, 7—13 in·lbf}

6. Referring to the following chart, select the correct volume percentage of the water and coolant. **Antifreeze solution mixture percentage (Except FL22 type engine coolant)**

Engine coolant protection	Volume percentage (%)		Gravity at 20 °C {68 °F}
	Water	Coolant	
Above -16 °C {3 °F}	65	35	1.057
Above -26 °C {-15 °F}	55	45	1.072

Above -40 °C { -40 °F}	45	55	1.086
------------------------	----	----	-------

7. Refill the coolant into the coolant reserve tank up to the F mark on the tank.

8. Install the cooling system cap.

**CAUTION:**

- If the water temperature gauge rises too high, stop the engine and decrease the water temperature to prevent overheating. Then, verify the malfunctioning part and repair or replace it.
- If the engine coolant level in the coolant reserve tank is below the L mark during engine coolant air bleeding operation, stop the engine, and after the engine coolant temperature decreases, add engine coolant. Then, resume the engine coolant air bleeding operation.

9. Start the engine and warm up the engine by idling.

**NOTE:**

- If the accelerator pedal is depressed continuously for a specified time, the engine speed may decrease to the idle speed. This is due to the fuel cut control operation, which prevents overheating, and it does not indicate a malfunction.

10. After the engine warms up, perform the following steps. At this time, be careful of the coolant temperature to prevent overheating.

- Run the engine at **approx. 2,500 rpm** for **5 min.**
- Run the engine at **approx. 3,000 rpm** for 5 s, then idle.
- Repeat step (2) 4—5 times.

11. Stop the engine, and inspect the coolant level after the coolant temperature decreases. If it is low, repeat steps 7—10.

12. Inspect for engine coolant leakage. (See **ENGINE COOLANT LEAKAGE INSPECTION [LF].**)

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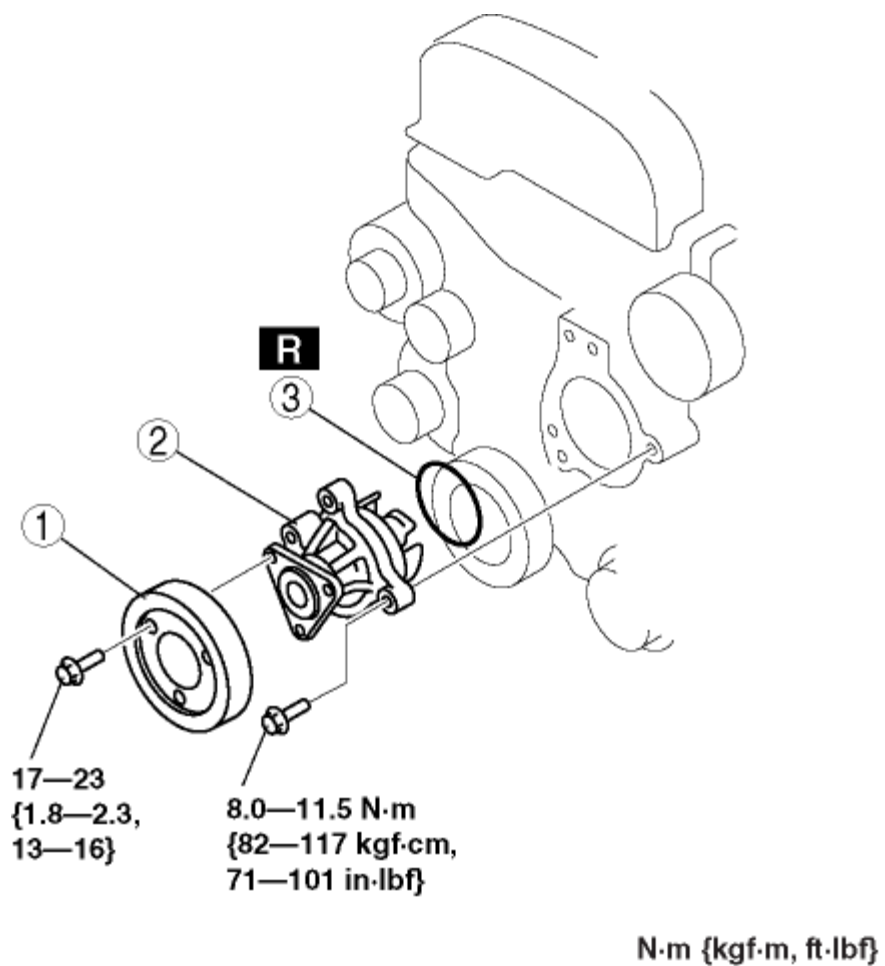
## 2008 - MX-5 - Engine

### WATER PUMP REMOVAL/INSTALLATION [LF]

#### WARNING:

- Never remove the cooling system cap or loosen the radiator drain plug while the engine is running, or when the engine and radiator are hot. Scalding engine coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.
- Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise to the first stop. Step back while the pressure escapes.
- When you are sure all the pressure is gone, press down on the cap using the cloth, turn it, and remove it.

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Drain the engine coolant. (See [ENGINE COOLANT REPLACEMENT \[LF\]](#).)
4. Remove the air cleaner. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
5. Loosen the water pump pulley bolt and remove the drive belt. (See [DRIVE BELT REPLACEMENT \[LF\]](#).)
6. Remove in the order indicated in the table.
7. Install in the reverse order of removal.
8. Refill the engine coolant. (See [ENGINE COOLANT REPLACEMENT \[LF\]](#).)
9. Inspect for engine coolant leakage. (See [ENGINE COOLANT LEAKAGE INSPECTION \[LF\]](#).)



1	Water pump pulley
---	-------------------

2	Water pump
---	------------

3	O-ring
---	--------

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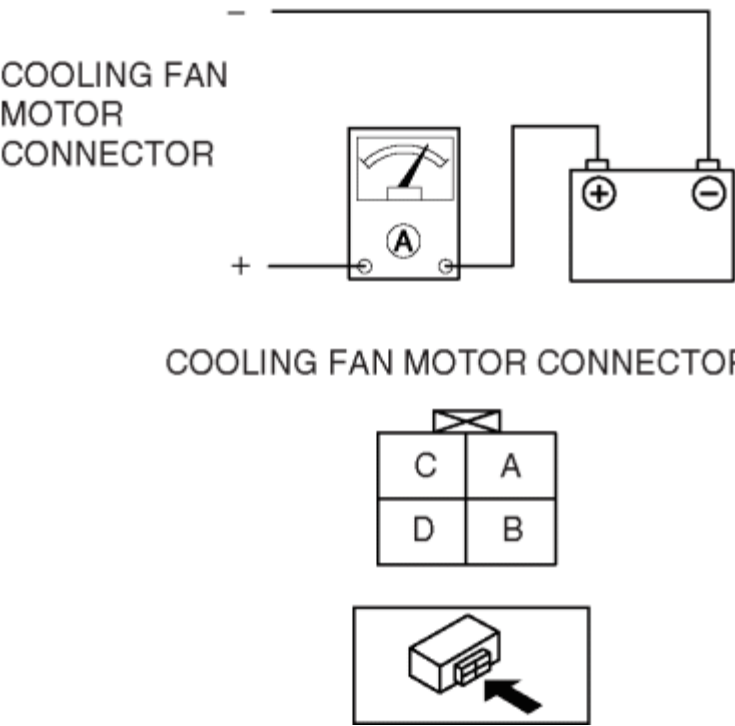
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2008 - MX-5 - Engine

FAN MOTOR INSPECTION [LF]

Part inspection

- 1. Verify that the battery is fully charged.
- 2. Install a tester and battery to the cooling fan motor connector (4 terminals) as shown in the figure.



Fan motor rotation speed	Connection terminal	
	Positive	Negative
High	A and C	B and D
Middle	C	B and D
Low	C	B

3. Verify that fan motor operates smoothly at the standard current.

- If there is any malfunction, replace the applicable part.

**Cooling fan motor current**

- High: 9.0—12.0 A
- Middle: 6.4—9.4 A
- Low: 4.8—7.8 A

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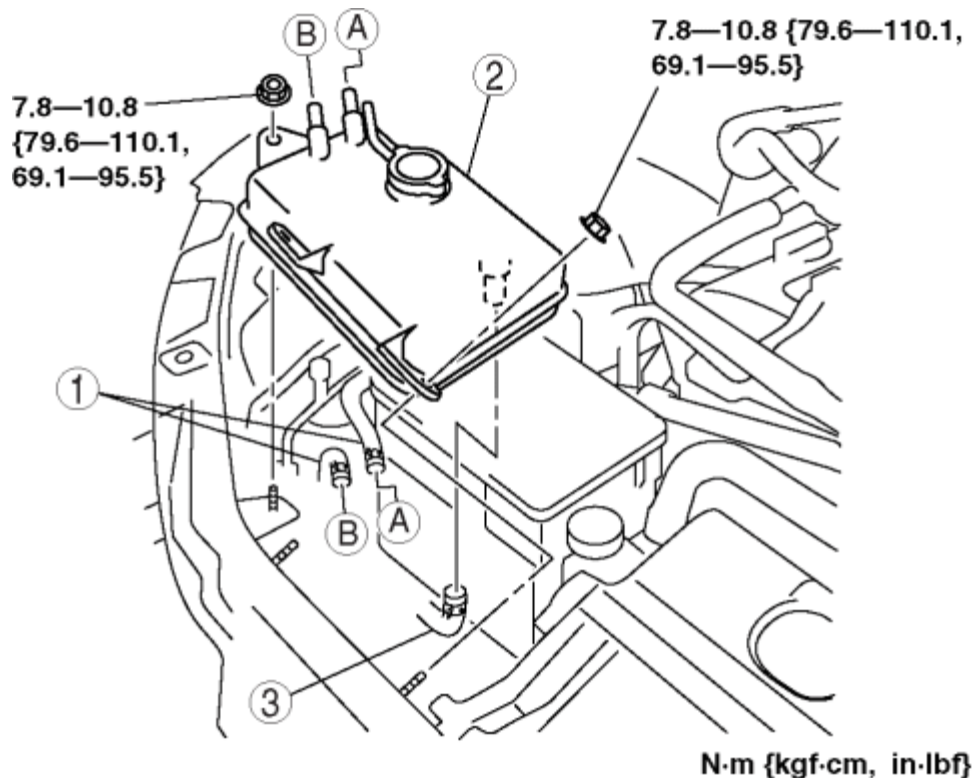
## 2008 - MX-5 - Engine

### COOLANT RESERVE TANK REMOVAL/INSTALLATION [LF]

#### WARNING:

- Never remove the cooling system cap or loosen the radiator drain plug while the engine is running, or when the engine and radiator are hot. Scalding engine coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.
- Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise to the first stop. Step back while the pressure escapes.
- When you are sure all the pressure is gone, press down on the cap using the cloth, turn it, and remove it.

1. Drain the engine coolant until the coolant reserve tank becomes empty. (See [ENGINE COOLANT REPLACEMENT \[LF\]](#).)
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.
4. Add engine coolant. (See [ENGINE COOLANT REPLACEMENT \[LF\]](#).)
5. Inspect for engine coolant leakage. (See [ENGINE COOLANT LEAKAGE INSPECTION \[LF\]](#).)





1	Hose
2	Coolant reserve tank
3	Hose

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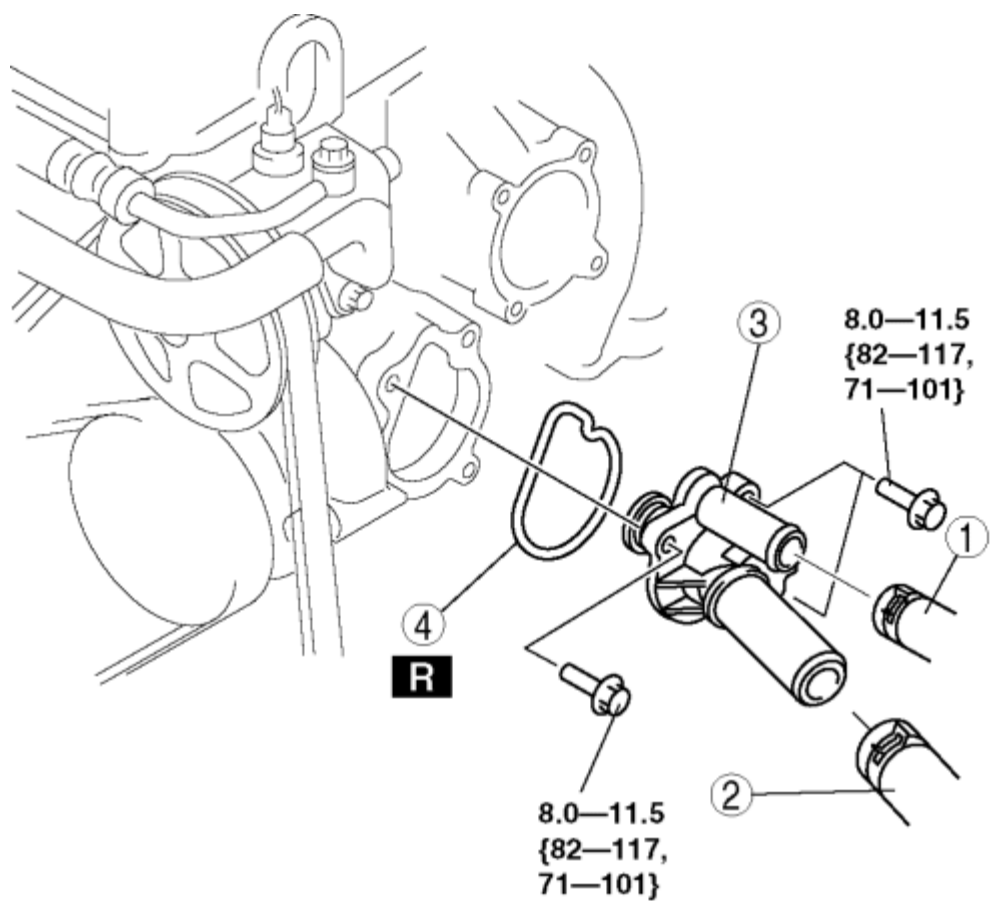
## 2008 - MX-5 - Engine

### THERMOSTAT REMOVAL/INSTALLATION [LF]

#### WARNING:

- Never remove the cooling system cap or loosen the radiator drain plug while the engine is running, or when the engine and radiator are hot. Scalding engine coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.
- Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise to the first stop. Step back while the pressure escapes.
- When you are sure all the pressure is gone, press down on the cap using the cloth, turn it, and remove it.

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Drain the engine coolant. (See [ENGINE COOLANT REPLACEMENT \[LF\]](#).)
4. Remove the throttle body. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.
7. Refill the engine coolant. (See [ENGINE COOLANT REPLACEMENT \[LF\]](#).)
8. Inspect for engine coolant leakage. (See [ENGINE COOLANT LEAKAGE INSPECTION \[LF\]](#).)



N·m {kgf·cm, in·lbf}

1 Bypass hose

2 Lower radiator hose

3 Thermostat component

4 Gasket

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## 2008 - MX-5 - Engine

### THERMOSTAT INSPECTION [LF]

1. Inspect the thermostat for the following.

#### **WARNING:**

- During inspection, the thermostat and water are extremely hot and can cause severe burns. Do not touch the thermostat and water.
- The valve should not open under normal temperature.
- Opening temperature and valve lift
  - If there is malfunction, replace the thermostat.

#### **Thermostat initial-opening temperature**

- 80—84 °C {176—183 °F}

#### **Thermostat full-open temperature**

- 97 °C {207 °F}

#### **Thermostat full-open lift**

- More than 8.0 mm {0.31 in}

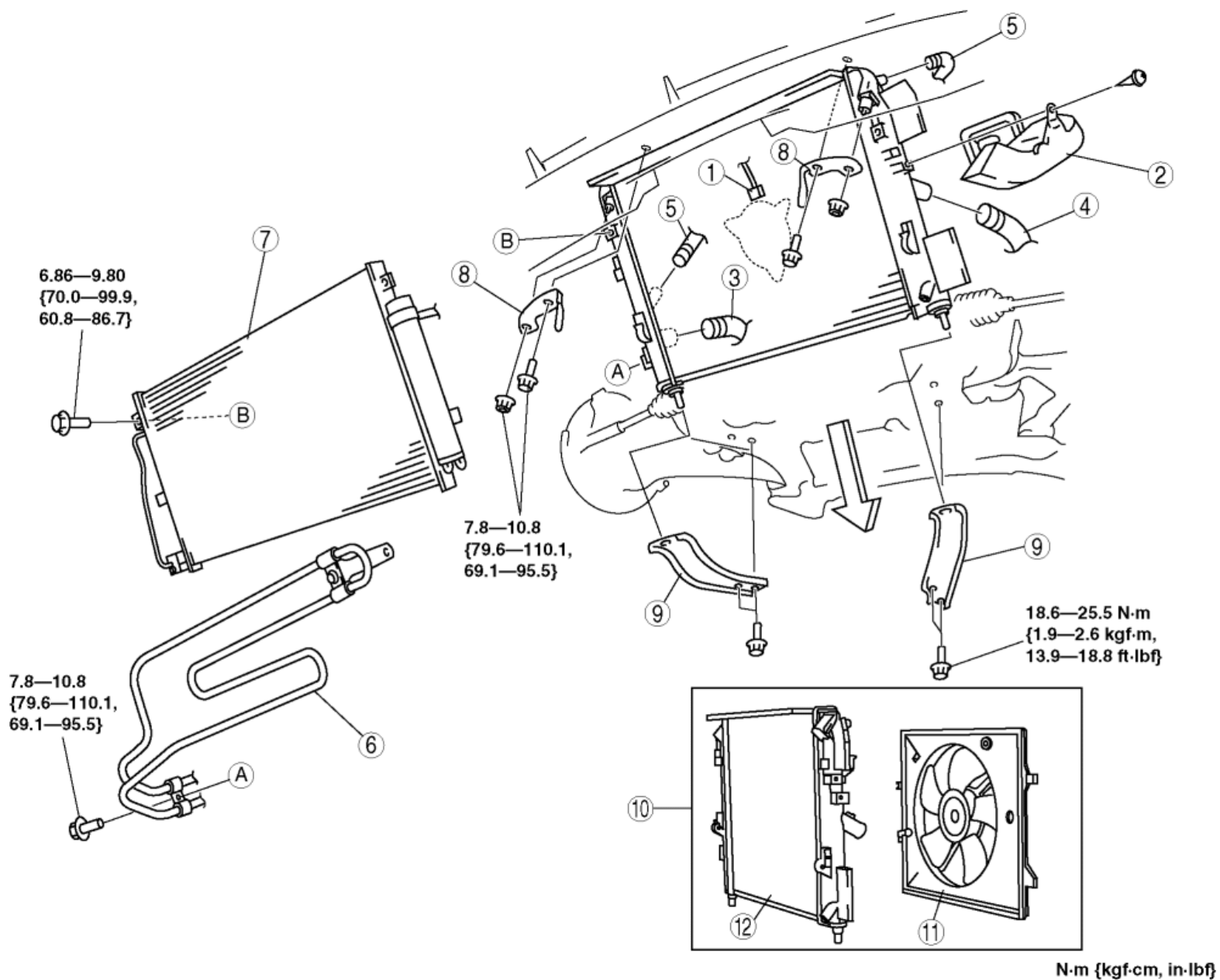
## 2008 - MX-5 - Engine

### RADIATOR REMOVAL/INSTALLATION [LF]

#### WARNING:

- Never remove the cooling system cap or loosen the radiator drain plug while the engine is running, or when the engine and radiator are hot. Scalding engine coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.
- Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise to the first stop. Step back while the pressure escapes.
- When you are sure all the pressure is gone, press down on the cap using the cloth, turn it, and remove it.

1. Remove the splash shield and under cover.
2. Drain the engine coolant. (See [ENGINE COOLANT REPLACEMENT \[LF\]](#).)
3. Remove the battery, battery tray, and battery duct. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
4. Remove the air cleaner. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
5. Remove the PCM and air cleaner insulator. (See [PCM REMOVAL/INSTALLATION \[LF\]](#).)
6. Remove the coolant reserve tank. (See [COOLANT RESERVE TANK REMOVAL/INSTALLATION \[LF\]](#).)
7. Disconnect the ATF oil cooler hose. (AT)
8. Remove in the order indicated in the table.
9. Install in the reverse order of removal.
10. Refill the engine coolant. (See [ENGINE COOLANT REPLACEMENT \[LF\]](#).)
11. Inspect for engine coolant leakage. (See [ENGINE COOLANT LEAKAGE INSPECTION \[LF\]](#).)
12. Inspect the ATF level. (AT) (See [AUTOMATIC TRANSMISSION FLUID \(ATF\) INSPECTION \[SJ6A-EL\]](#).)



1	Cooling fan motor connector
2	PCM duct
3	Radiator lower hose
4	Radiator upper hose
5	Coolant reserve tank hose
6	P/S cooling pipe (See <a href="#">RADIATOR REMOVAL/INSTALLATION [LF]</a> .)
7	Condenser (See <a href="#">RADIATOR REMOVAL/INSTALLATION [LF]</a> .)

8	Upper mount rubber bracket
9	Lower mount rubber bracket
10	Radiator and cooling fan component
11	Cooling fan component
12	Radiator

#### **P/S Cooling Pipe Removal Note**

1. Remove the P/S cooling pipe with the hoses still connected.

#### **Condenser Removal Note**

1. Remove the condenser with the cooler pipes still connected.

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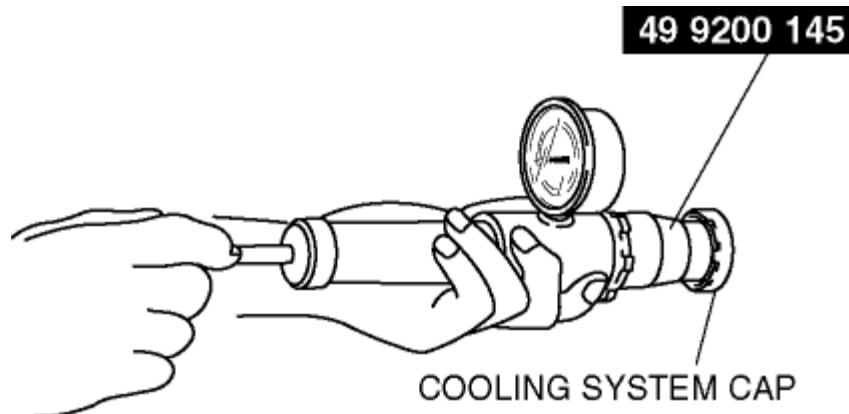
## 2008 - MX-5 - Engine

### COOLING SYSTEM CAP INSPECTION [LF]

#### WARNING:

- Never remove the cooling system cap or loosen the radiator drain plug while the engine is running, or when the engine and radiator are hot. Scalding engine coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.
- Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise to the first stop. Step back while the pressure escapes.
- When you're sure all the pressure is gone, press down on the cap using the cloth, turn it, and remove it.

1. Clean the cooling system cap and the sealed part.
2. Inspect for cracks or roll up on the sealed part of the cooling system cap.
  - If there is any malfunction, replace the cooling system cap.
3. Attach the cooling system cap to the **SST** and a radiator cap tester.



4. Hold the cooling system cap downward and apply pressure gradually. Verify that the pressure is held stable for **10 s**.

- If the pressure is not held stable, replace the cooling system cap.

#### Cooling system cap valve opening pressure

- 93.2—122.6 kPa {0.95—1.25 kgf/cm<sup>2</sup>, 13.5—17.8 psi}



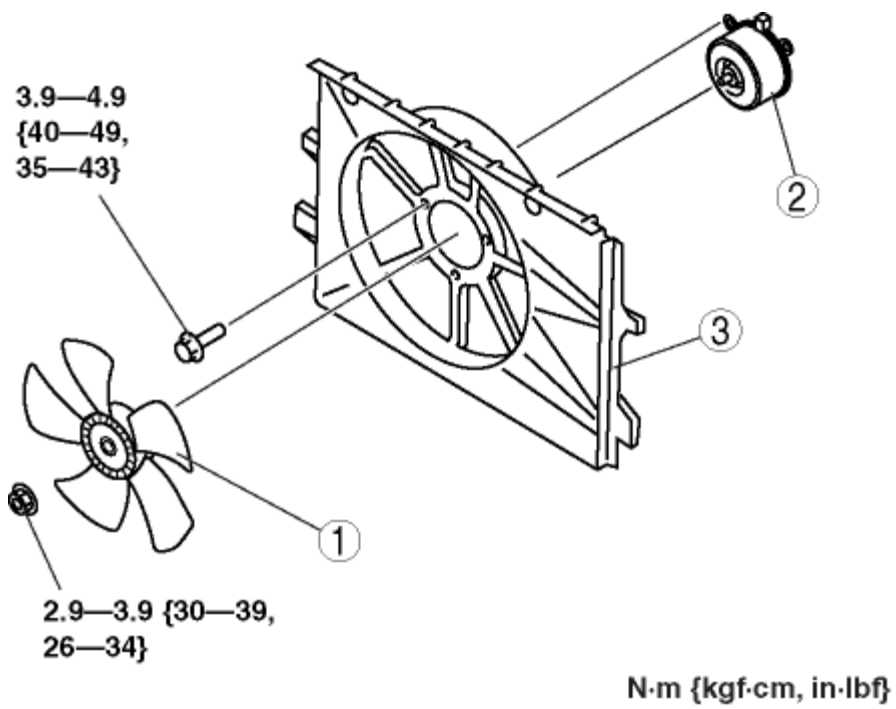
## 2008 - MX-5 - Engine

### COOLING FAN COMPONENT REMOVAL/INSTALLATION [LF]

#### WARNING:

- Never remove the cooling system cap or loosen the radiator drain plug while the engine is running, or when the engine and radiator are hot. Scalding engine coolant and steam may shoot out and cause serious injury. It may also damage the engine and cooling system.
- Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise to the first stop. Step back while the pressure escapes.
- When you are sure all the pressure is gone, press down on the cap using the cloth, turn it, and remove it.

1. Remove the splash shield and under cover.
2. Drain the engine coolant. (See [ENGINE COOLANT REPLACEMENT \[LF\]](#).)
3. Remove the battery, battery tray, and battery duct. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
4. Remove the air cleaner. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
5. Remove the PCM and air cleaner insulator. (See [PCM REMOVAL/INSTALLATION \[LF\]](#).)
6. Remove the coolant reserve tank. (See [COOLANT RESERVE TANK REMOVAL/INSTALLATION \[LF\]](#).)
7. Disconnect the ATF oil cooler hose. (AT)
8. Remove the radiator and cooling fan component. (See [RADIATOR REMOVAL/INSTALLATION \[LF\]](#).)
9. Remove in the order indicated in the table.
10. Install in the reverse order of removal.
11. Refill the engine coolant. (See [ENGINE COOLANT REPLACEMENT \[LF\]](#).)
12. Inspect for engine coolant leakage. (See [ENGINE COOLANT LEAKAGE INSPECTION \[LF\]](#).)
13. Inspect the ATF level. (AT) (See [AUTOMATIC TRANSMISSION FLUID \(ATF\) INSPECTION \[SJ6A-EL\]](#).)



1	Cooling fan
2	Cooling fan motor
3	Radiator cowling

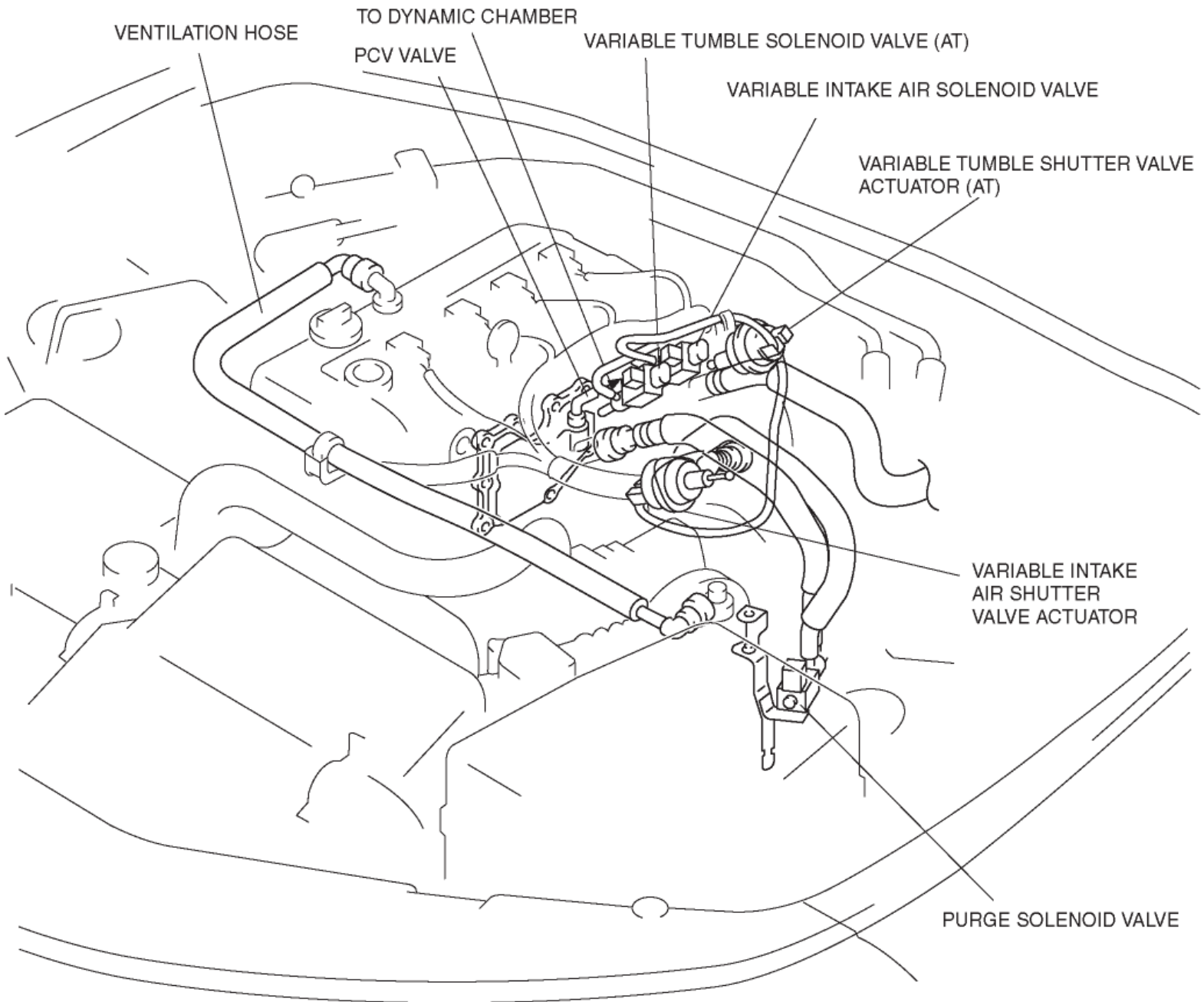
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## 2008 - MX-5 - Engine

### INTAKE-AIR SYSTEM VACUUM HOSE ROUTING DIAGRAM [LF]



## 2008 - MX-5 - Engine

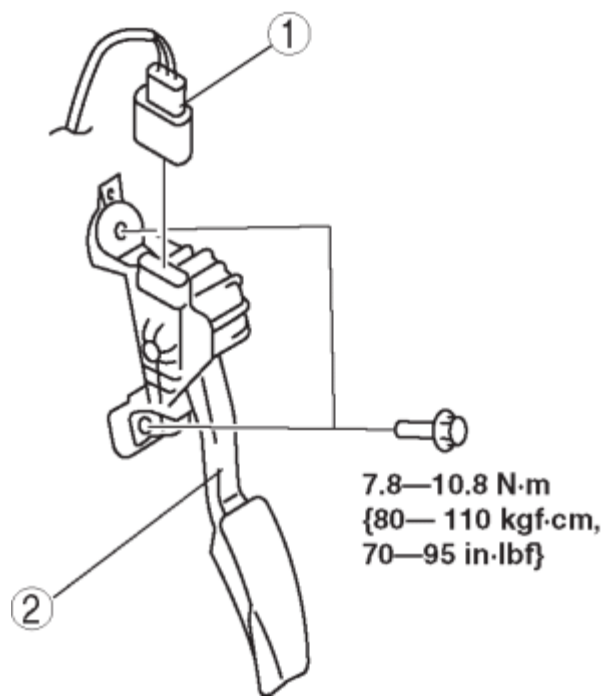
### AIR CLEANER ELEMENT INSPECTION [LF]

1. Remove the air cleaner element. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
2. Inspect the following items:
  - If there is any abnormality, clean or replace the air cleaner element.
    - Has the replacement interval come?
    - Is the air cleaner element soiled, damaged, or bent?
    - Are the air cleaner case and the air cleaner element correctly sealed?
    - Is the correct air cleaner element installed?

2008 - MX-5 - Engine

ACCELERATOR PEDAL REMOVAL/INSTALLATION [LF]

- 1. Remove the battery cover.
- 2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#))
- 3. Remove in the order indicated in the table.



1	Connector
2	Installation bolt
3	Accelerator pedal

- 4. Install in the reverse order of removal.

## 2008 - MX-5 - Engine

### INTAKE MANIFOLD VACUUM INSPECTION [LF]

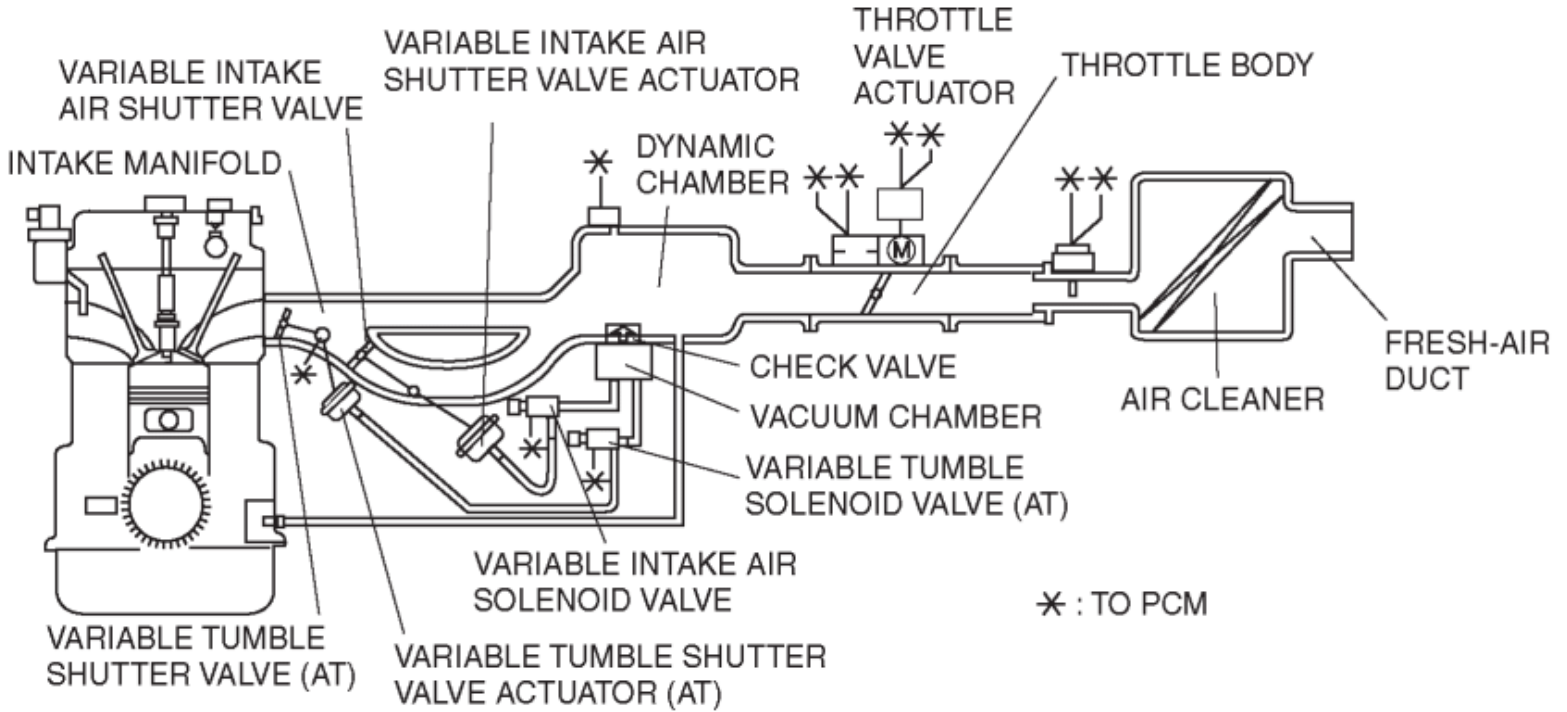
1. Verify that the intake air hoses are installed securely.
2. Disconnect the vacuum hose connecting the intake manifold and the purge solenoid valve (purge solenoid valve side) and install the vacuum gauge.
3. Warm up the engine.
4. Measure the intake manifold vacuum while idling (no load) using the vacuum gauge.
  - If not within the specification, perform the following inspections.
    - Compression pressure (See [COMPRESSION INSPECTION \[LF\]](#).)
    - Air intake
      - Each hose installation part
      - Throttle body installation part
      - Fuel injector installation part
      - PCV valve installation part
      - Dynamic chamber installation port
      - Intake manifold installation part

#### Standard

- -60 kPa {-450 mmHg, -17.7 inHg} or more

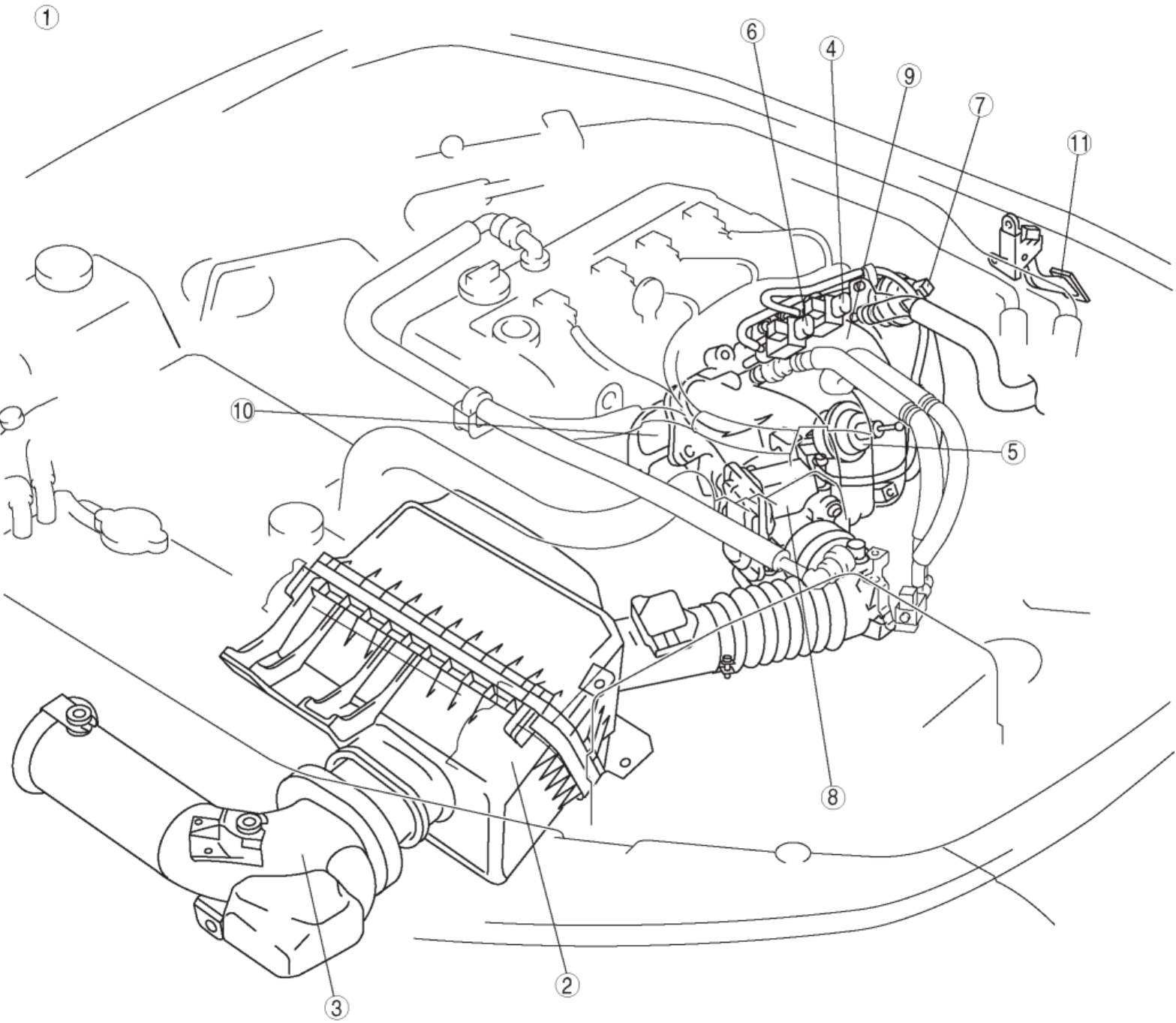
## 2008 - MX-5 - Engine

### INTAKE-AIR SYSTEM DIAGRAM [LF]



2008 - MX-5 - Engine

INTAKE-AIR SYSTEM LOCATION INDEX [LF]



1	Intake-air system (See <a href="#">INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [LF]</a> .)
2	Air cleaner (See <a href="#">AIR CLEANER ELEMENT INSPECTION [LF]</a> .)



3	Fresh-air duct (See <a href="#">INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [LF].</a> )
4	Variable intake air solenoid valve (See <a href="#">VARIABLE INTAKE AIR SOLENOID VALVE INSPECTION [LF].</a> ) (See <a href="#">VARIABLE INTAKE AIR SOLENOID VALVE REMOVAL/INSTALLATION [LF].</a> )
5	Variable intake air shutter valve actuator (See <a href="#">VARIABLE INTAKE AIR SHUTTER VALVE ACTUATOR INSPECTION [LF].</a> )
6	Variable tumble solenoid valve (AT) (See <a href="#">VARIABLE TUMBLE SOLENOID VALVE REMOVAL/INSTALLATION [LF].</a> ) (See <a href="#">VARIABLE TUMBLE SOLENOID VALVE INSPECTION [LF].</a> )
7	Variable tumble shutter valve actuator (AT) (See <a href="#">VARIABLE TUMBLE SHUTTER VALVE ACTUATOR REMOVAL/INSTALLATION [LF].</a> ) (See <a href="#">VARIABLE TUMBLE SHUTTER VALVE ACTUATOR INSPECTION [LF].</a> )
8	Throttle body (See <a href="#">THROTTLE BODY INSPECTION [LF].</a> )
9	Dynamic chamber (See <a href="#">INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [LF].</a> )
10	Intake manifold (See <a href="#">INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [LF].</a> )
11	Accelerator pedal (See <a href="#">ACCELERATOR PEDAL REMOVAL/INSTALLATION [LF].</a> )

2008 - MX-5 - Engine

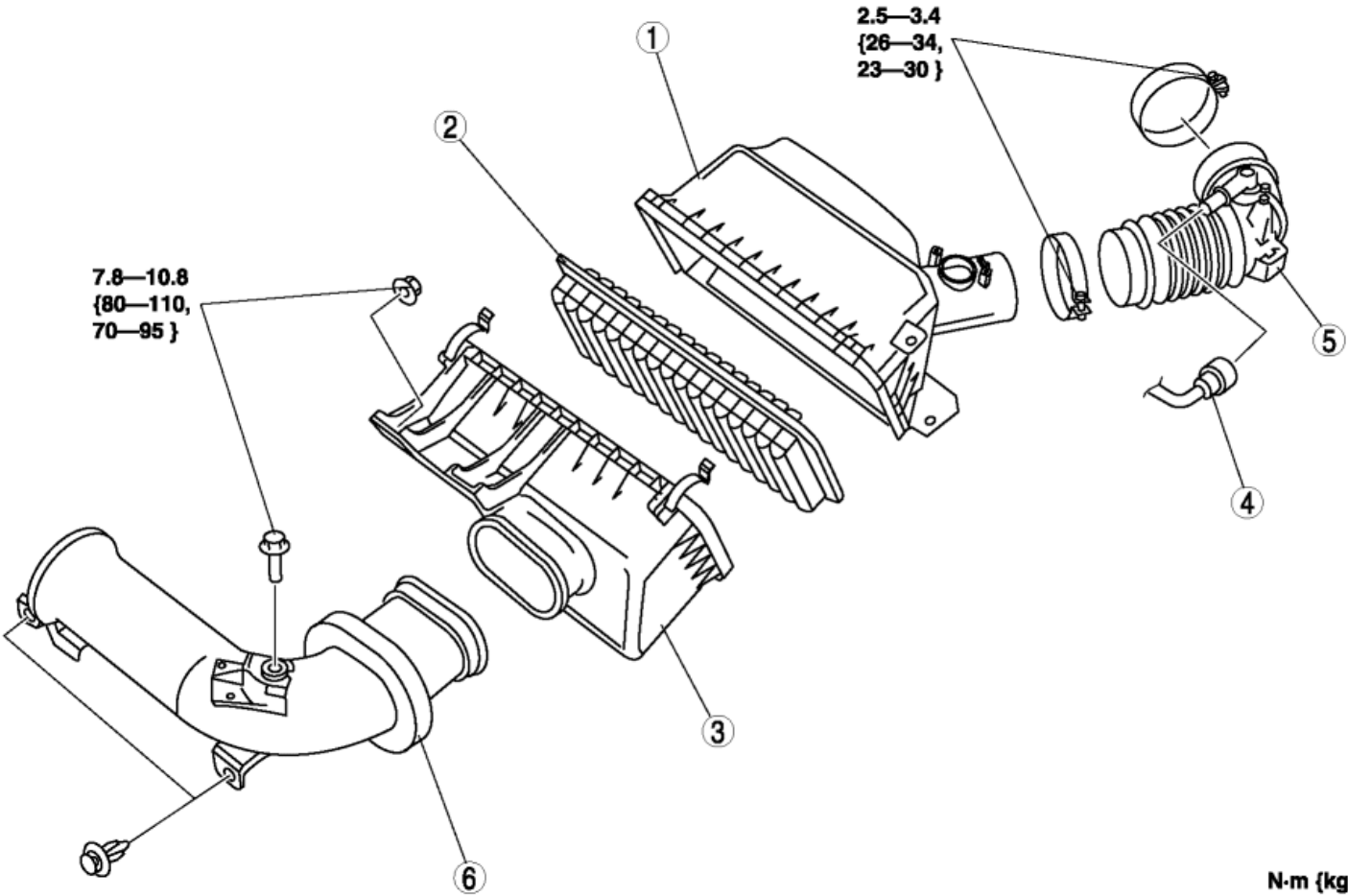
INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [LF]

WARNING:

- A hot engine and intake-air system can cause severe burns. Turn off the engine and wait until they are cool before removing the intake-air system.
- Fuel line spills and leakage from the pressurized fuel system are dangerous. Fuel can ignite and cause serious injury or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure", while referring to the "BEFORE SERVICE PRECAUTIONS".

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#))
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.
5. Add the engine coolant to the cooling system filler neck and the coolant reserve tank to replace that during servicing.
6. Inspect the engine coolant level. (See [ENGINE COOLANT LEVEL INSPECTION \[LF\]](#).)
7. Inspect for engine coolant leakage. (See [ENGINE COOLANT LEAKAGE INSPECTION \[LF\]](#).)

Step 1

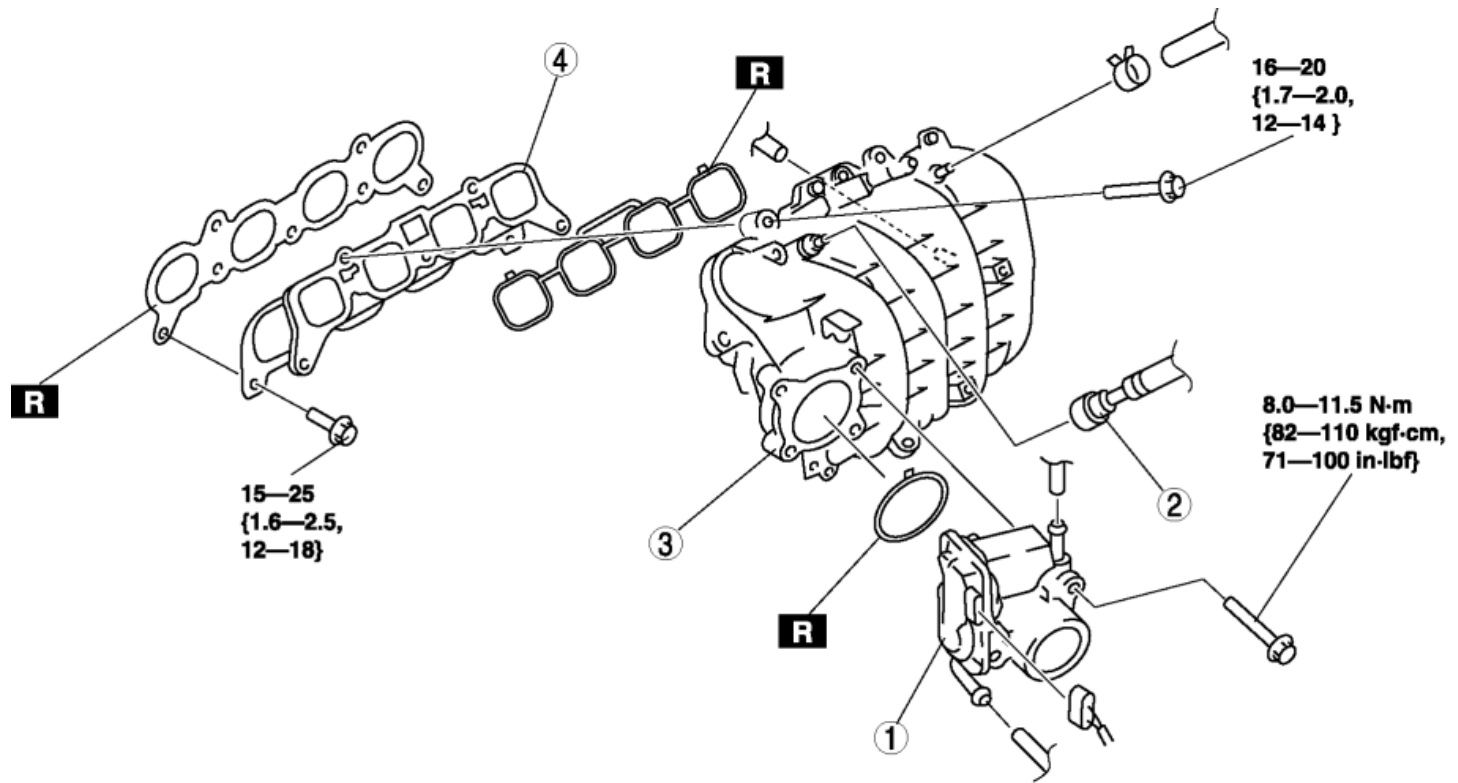


N·m {kgf·cm, in·lbf}

1 Air cleaner cover

(See <a href="#">INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [LF].</a> )
2Air cleaner element
3Air cleaner case
4Quick release connector (Type B)
(See <a href="#">QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/INSTALLATION [LF].</a> )
5Air hose
(See <a href="#">INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [LF].</a> )
6Fresh-air duct
(See <a href="#">INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [LF].</a> )

Step 2



N·m {kgf·m, ft·lbf}

1Throttle body
(See <a href="#">Throttle Body Removal Note.</a> )
(See <a href="#">Throttle Body Installation Note.</a> )
2Quick release connector (Type A)
(See <a href="#">QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/INSTALLATION [LF].</a> )
3Dynamic chamber
(See <a href="#">INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [LF].</a> )

4 Intake manifold
-------------------

(See [Intake Manifold Removal Note \(AT\)](#).)

#### Air Cleaner Cover Removal Note

1. Remove the MAF/IAT sensor. (See [MASS AIR FLOW \(MAF\)/INTAKE AIR TEMPERATURE \(IAT\) SENSOR REMOVAL/INSTALLATION \[LF\]](#).)

#### Air Hose Removal Note

1. Move the purge solenoid valve slightly out of the way. (See [PURGE SOLENOID VALVE REMOVAL/INSTALLATION \[LF\]](#).)

#### Fresh-air Duct Removal Note

1. Remove the front bumper. (See [FRONT BUMPER REMOVAL/INSTALLATION](#).)

#### Throttle Body Removal Note

##### WARNING:

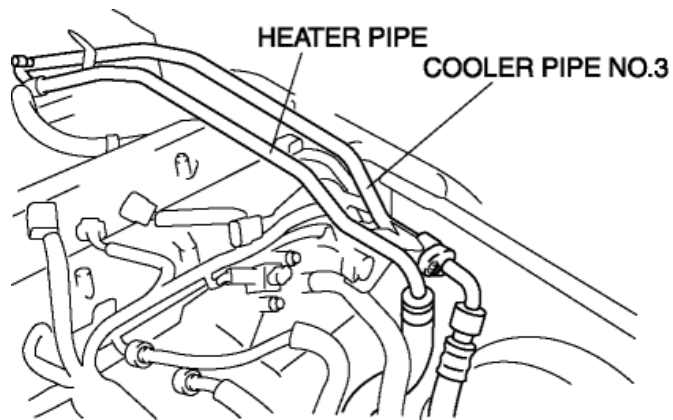
- Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise to the first stop. Step back while the pressure escapes.
- When you are sure all the pressure is gone, press down on the cap using the cloth, turn it, and remove it.

##### CAUTION:

- Do not plug the water hose with a sharp-edged object. Otherwise, the hose could be damaged.
1. Wrap a clean cloth around the cooling system cap and release the pressure by loosening the cap slowly.
  2. Remove the water hose from the throttle body and plug the water hose quickly.

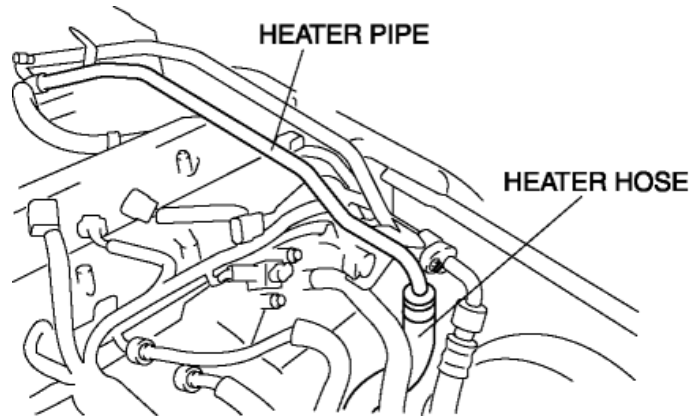
#### Dynamic Chamber Removal Note

1. Remove the plug hole plate. (See [PLUG HOLE PLATE REMOVAL/INSTALLATION \[LF\]](#))
2. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See [BEFORE SERVICE PRECAUTION \[LF\]](#).)
3. Remove the service hole cover.
  - a. Remove the front suspension tower bar (joint), (right side) and (left side). (See [FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION](#).)
  - b. Remove the wiper arm. (See [WIPER ARM AND BLADE REMOVAL/INSTALLATION](#).)
  - c. Remove the cowl grille. (See [COWL GRILLE REMOVAL/INSTALLATION](#).)
  - d. Remove the side cowl grille. (See [SIDE COWL GRILLE REMOVAL/INSTALLATION](#).)
  - e. Move the cooler pipe No.3 and heater pipe slightly out of the way.

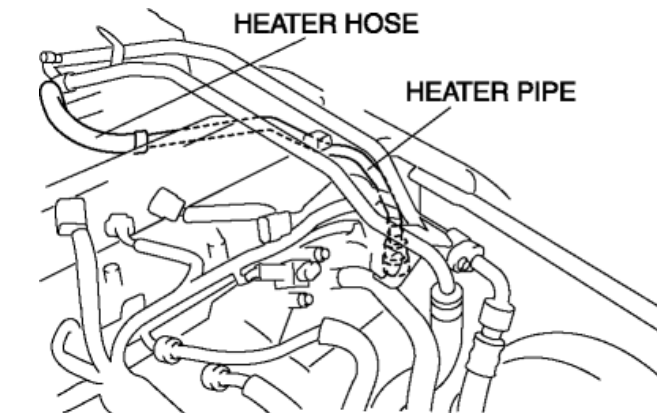


f. Remove the service hole cover. (See [EGR VALVE REMOVAL/INSTALLATION \[LF.\]](#).)

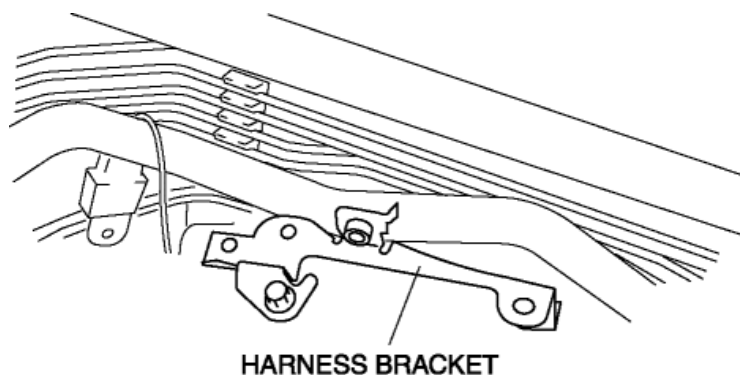
4. Disconnect the heater hose and move the heater pipe slightly out of the way.



5. Disconnect the heater hose and move the heater pipe slightly out of the way.



6. Remove the harness bracket.

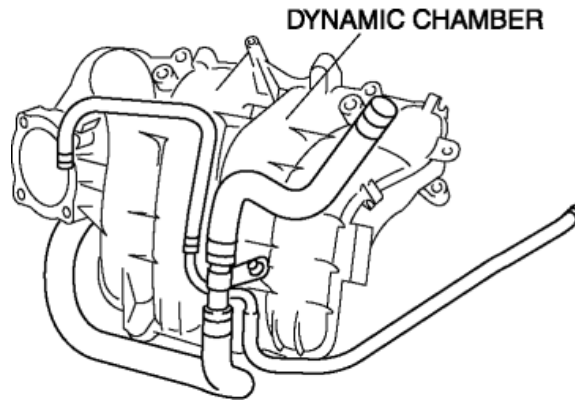


7. Remove the under cover. (See [TRANSVERSE MEMBER REMOVAL/INSTALLATION.](#))

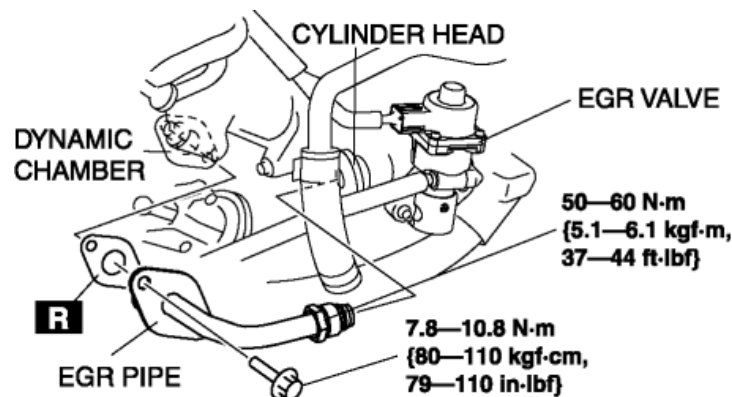
8. Disconnect the variable intake air solenoid valve connector, variable tumble solenoid valve connector, EGR valve connector,

CMP sensor connector and PSP switch connector.

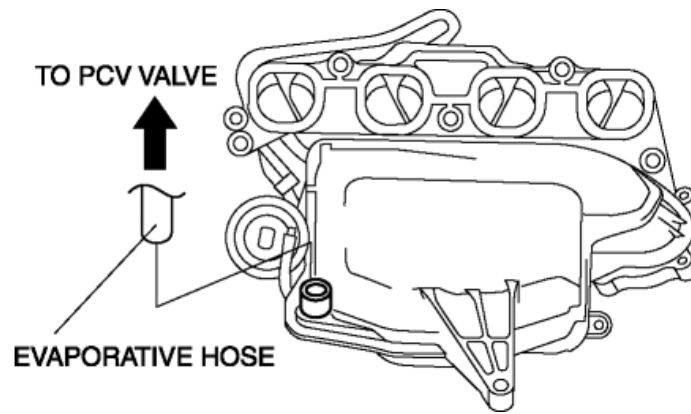
9. Disconnect the ignition coil connector and fuel injector connector and move the harness slightly out of the way.
10. Disconnect the quick release connector from the fuel distributor. (See [QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION \[LF\]](#).)
11. Remove the fuel distributor. (See [FUEL INJECTOR REMOVAL/INSTALLATION \[LF\]](#).)
12. Disconnect the water hose from the EGR valve.
13. Disconnect two water hoses from the thermostat.
14. Remove the heater hose and heater pipe from the dynamic chamber.



15. Remove the variable intake air solenoid valve. (See [VARIABLE INTAKE AIR SOLENOID VALVE REMOVAL/INSTALLATION \[LF\]](#).)
16. Remove the variable tumble solenoid valve. (See [VARIABLE TUMBLE SOLENOID VALVE REMOVAL/INSTALLATION \[LF\]](#).)
17. Remove the dynamic chamber installation bolts.
18. Remove the EGR pipe.



19. Disconnect the connector from the A/C compressor.
20. Disconnect the knock sensor connector.
21. Move the vacuum hose between the purge solenoid valve and the charcoal canister slightly out of the way.
22. Move the clutch release cylinder slightly out of the way. (MT) (See [CLUTCH RELEASE CYLINDER REMOVAL/INSTALLATION](#).)
23. Disconnect the evaporative hose with the dynamic chamber raised.



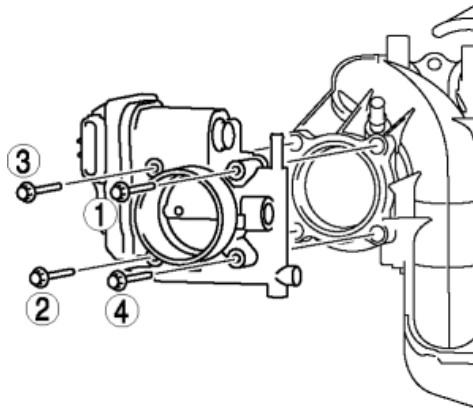
24. Remove the dynamic chamber.
25. Remove the variable intake air shutter valve actuator. (See [VARIABLE INTAKE AIR SHUTTER VALVE ACTUATOR REMOVAL/INSTALLATION \[LF\]](#).)
26. Remove the MAP sensor. (See [MANIFOLD ABSOLUTE PRESSURE \(MAP\) SENSOR REMOVAL/INSTALLATION \[LF\]](#).)

### Intake Manifold Removal Note (AT)

1. Remove the intake manifold.
2. Remove the variable tumble shutter valve actuator. (See [VARIABLE TUMBLE SHUTTER VALVE ACTUATOR REMOVAL/INSTALLATION \[LF\]](#).)

### Throttle Body Installation Note

1. Temporarily tighten the throttle body to the dynamic chamber.
2. Tighten the bolts in the order as shown in the figure.



### Throttle body tightening torque

- 8.0—11.5 N·m {82—110 kgf·cm, 71—100 in·lbf}

3. Remove the plug from the engine coolant hose and install the water hose to the throttle body quickly.

2008 - MX-5 - Engine

THROTTLE BODY INSPECTION [LF]

NOTE:

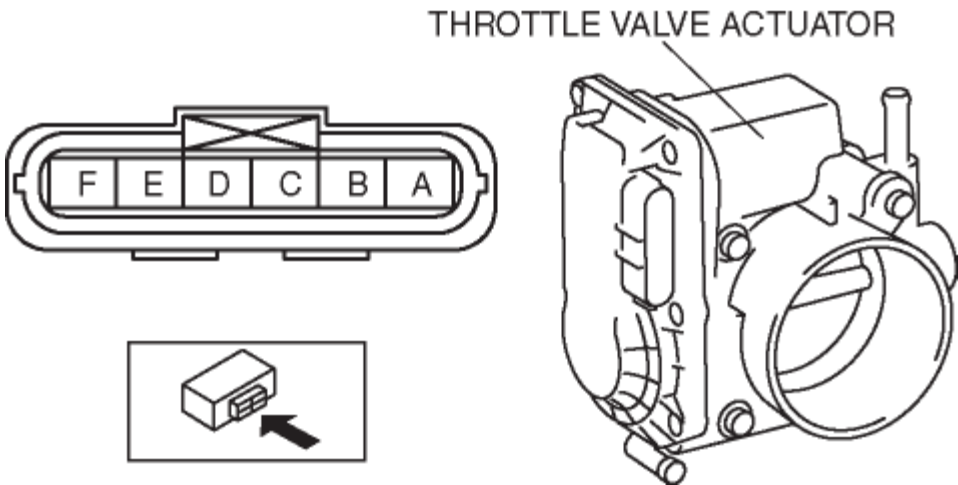
- Perform the following inspection only when directed.

Resistance Inspection

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Disconnect the throttle body connector.
4. Measure the resistance between throttle actuator terminals A and B.
  - If not as specified, replace the throttle body. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
  - If as specified, carry out the “Circuit Open/Short Inspection”.

Specification

Ambient temperature (°C {°F})	Resistance (ohm)
Approx. 20 {68}	0.3—100

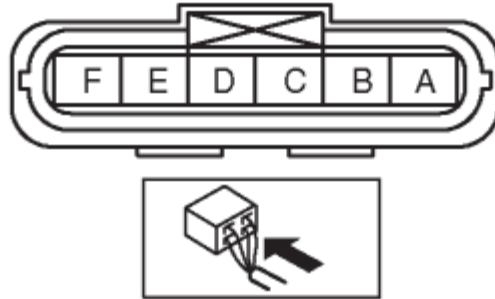


Circuit Open/Short Inspection



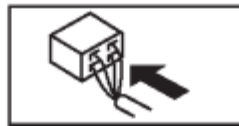
1. Disconnect the PCM connector. (See [PCM REMOVAL/INSTALLATION \[LF\]](#).)
2. Inspect the following wiring harnesses for open or short (continuity check).

THROTTLE VALVE ACTUATOR  
WIRING HARNESS-SIDE  
CONNECTOR



PCM  
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



**Open circuit**

- If there is no continuity, the circuit is open. Repair or replace the wiring harness.
  - Throttle valve actuator terminal A and PCM terminal 2B
  - Throttle valve actuator terminal B and PCM terminal 2A

**Short circuit**

- If there is continuity, the circuit is shorted. Repair or replace the wiring harness.
  - Throttle valve actuator terminal A and power supply
  - Throttle valve actuator terminal A and ground
  - Throttle valve actuator terminal B and power supply
  - Throttle valve actuator terminal B and ground



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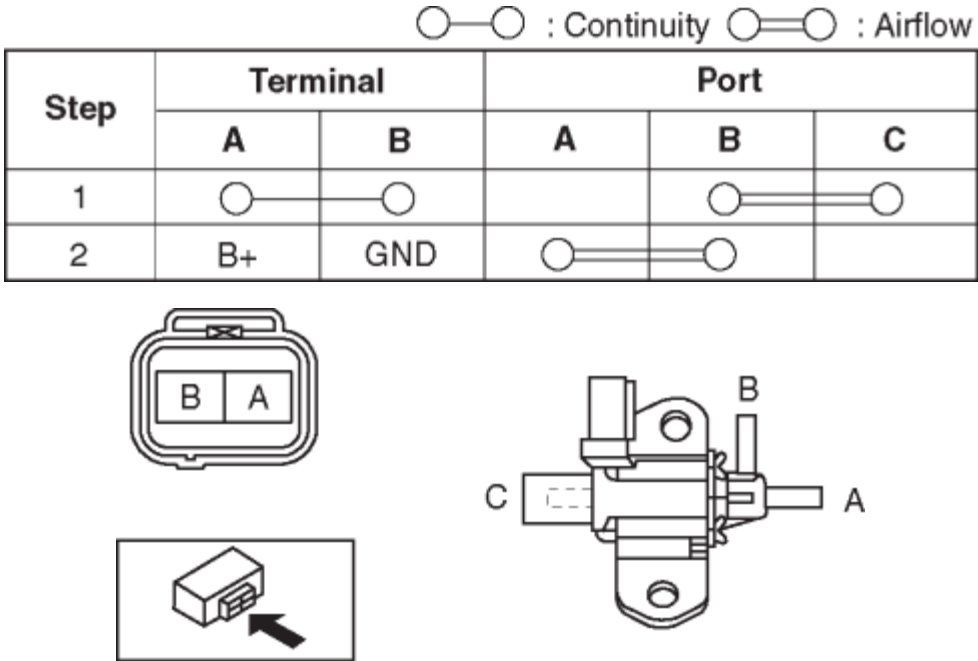
VARIABLE INTAKE AIR SOLENOID VALVE INSPECTION [LF]

NOTE:

- Perform the following inspection only when directed.

Airflow Inspection

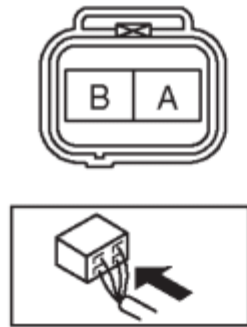
1. Remove the battery cover
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the variable intake air solenoid valve. (See [VARIABLE INTAKE AIR SOLENOID VALVE REMOVAL/INSTALLATION \[LF\]](#).)
4. Inspect airflow between the ports under the following conditions.
  - If not as specified, replace the variable intake air solenoid valve.
  - If as specified, carry out the “Circuit Open/Short Inspection”.



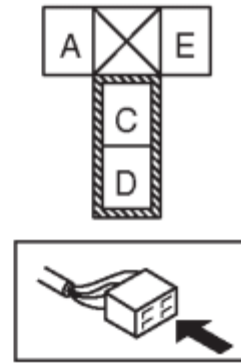
Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See [PCM REMOVAL/INSTALLATION \[LF\]](#).)
2. Inspect the following wiring harness for open or short (continuity check).

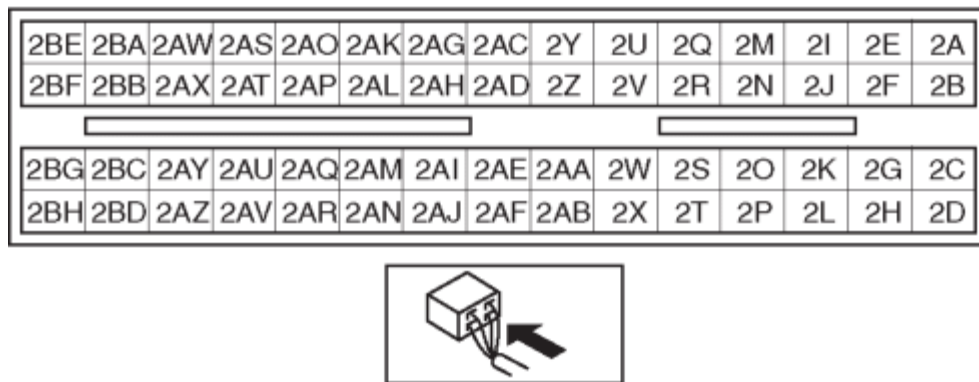
VARIABLE INTAKE AIR  
SOLENOID VALVE  
WIRING HARNESS-SIDE  
CONNECTOR



MAIN FUSE BLOCK  
(MAIN RELAY)



PCM  
WIRING HARNESS-SIDE CONNECTOR



**Open circuit**

- If there is no continuity, the circuit is open. Repair or replace the wiring harness.
  - Variable intake air solenoid valve terminal B and PCM terminal 2J
  - Variable intake air solenoid valve terminal A and main relay

**Short circuit**

- If there is continuity, the circuit is shorted. Repair or replace the wiring harness.
  - Variable intake air solenoid valve terminal B and power supply
  - Variable intake air solenoid valve terminal B and body ground
  - Variable intake air solenoid valve terminal A and body ground

2008 - MX-5 - Engine

VARIABLE TUMBLE SOLENOID VALVE INSPECTION [LF]

AT

NOTE:

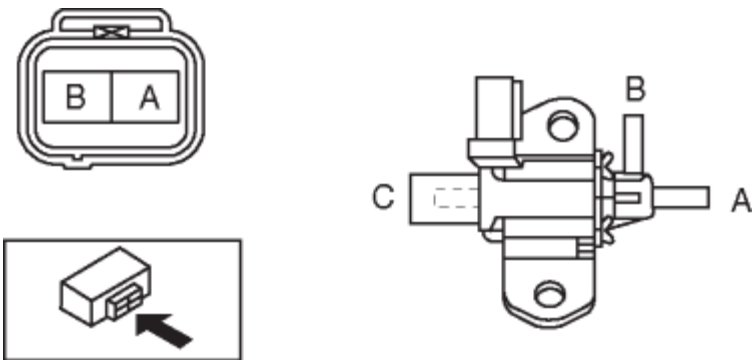
- Perform the following inspection only when directed.

Airflow Inspection

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the variable tumble solenoid valve. (See [VARIABLE TUMBLE SOLENOID VALVE REMOVAL/INSTALLATION \[LF\]](#).)
4. Inspect airflow between the ports under the following conditions.
  - If not as specified, replace the variable tumble solenoid valve.
  - If as specified, carry out the “Circuit Open/Short Inspection”.

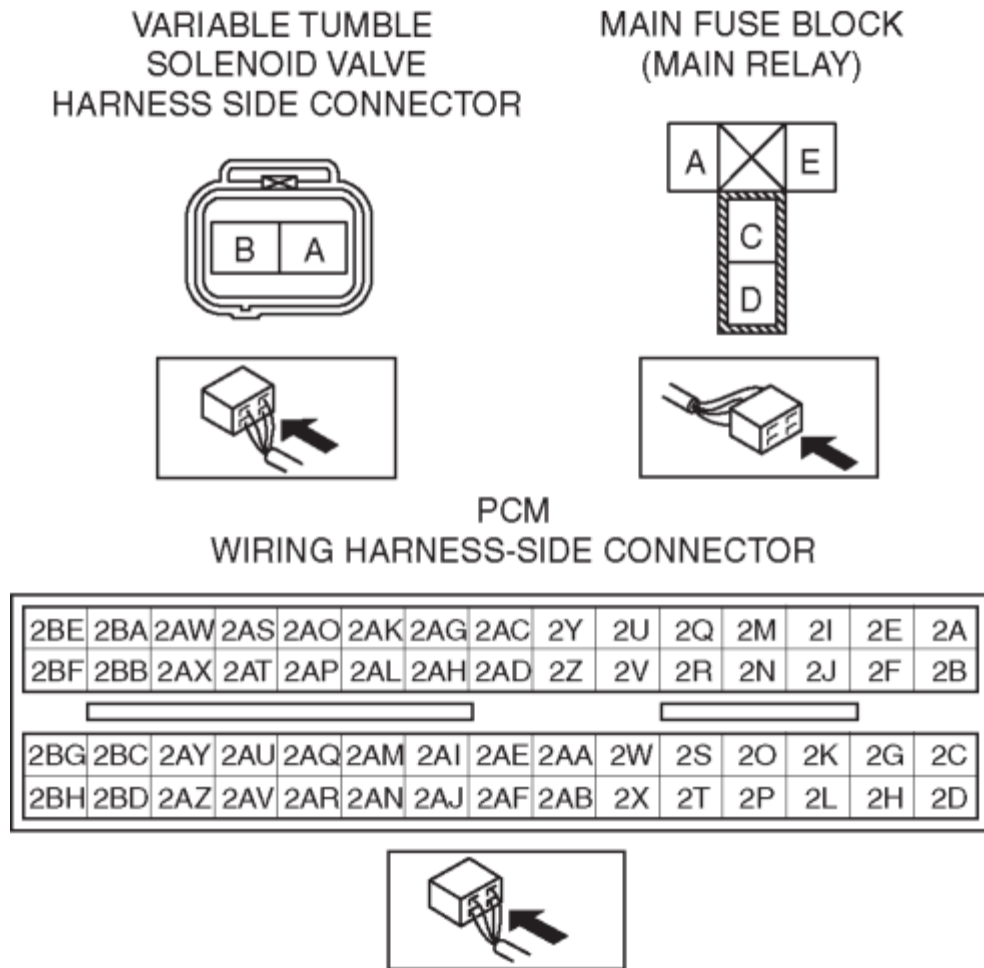
○—○ : Continuity   ○=○ : Airflow

Step	Terminal		Port		
	A	B	A	B	C
1	○	○		○=○	○=○
2	B+	GND	○=○	○=○	



Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See [PCM REMOVAL/INSTALLATION \[LF\]](#).)
2. Inspect the following wiring harness for open or short (continuity check).



### Open circuit

- If there is no continuity, the circuit is open. Repair or replace the wiring harness.
  - Variable tumble solenoid valve terminal B and PCM terminal 2I
  - Variable tumble solenoid valve terminal A and main relay

### Short circuit

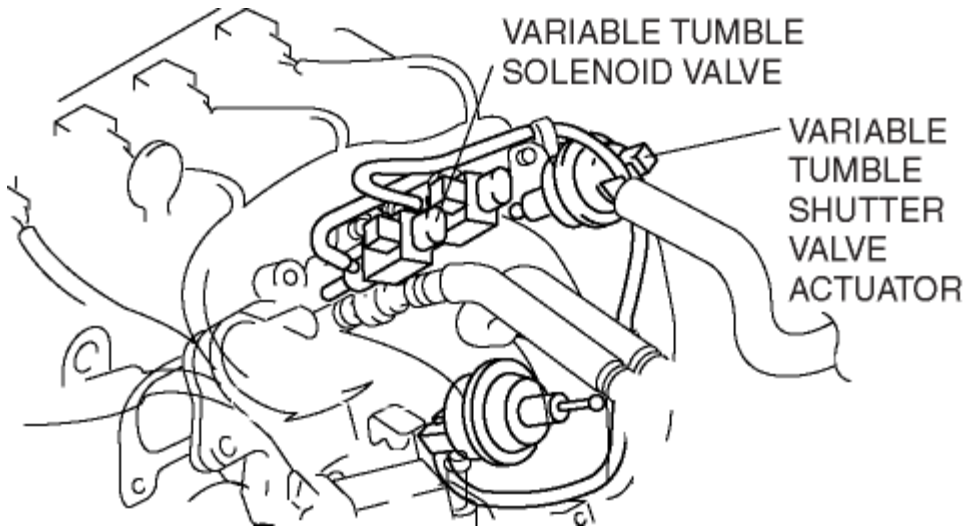
- If there is continuity, the circuit is shorted. Repair or replace the wiring harness.
  - Variable tumble solenoid valve terminal B and power supply
  - Variable tumble solenoid valve terminal B and body ground
  - Variable tumble solenoid valve terminal A and body ground

2008 - MX-5 - Engine

VARIABLE TUMBLE SHUTTER VALVE ACTUATOR INSPECTION [LF]

AT

- 1. Remove the service hole cover. (See [EGR VALVE REMOVAL/INSTALLATION \[LF\]](#).)
- 2. Disconnect the vacuum hose from the variable tumble solenoid valve.



- 3. Connect a vacuum pump to the vacuum hose.

NOTE:

- Verify that the variable tumble shutter valve actuator rod moves using a mirror.
- 4. Apply vacuum and verify that the rod moves.
  - If the rod dose not move, replace the variable tumble shutter valve actuator. (See [VARIABLE TUMBLE SHUTTER VALVE ACTUATOR REMOVAL/INSTALLATION \[LF\]](#).)

Vacuum kPa {mmHg, inHg}	Rod movement
Below —2.7 {—21, —0.9}	No operate
Above —33.4 {—251, —9.89}	Fully pulled

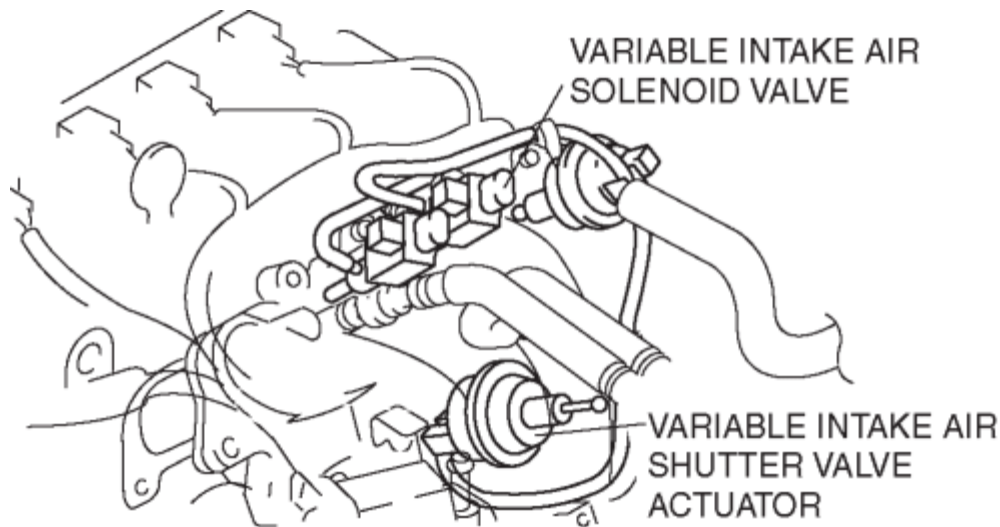




2008 - MX-5 - Engine

VARIABLE INTAKE AIR SHUTTER VALVE ACTUATOR INSPECTION [LF]

- 1. Remove the service hole cover. (See [EGR VALVE REMOVAL/INSTALLATION \[LF\]](#))
- 2. Disconnect the vacuum hose from the variable intake air solenoid valve.



- 3. Connect a vacuum pump to the vacuum hose.

NOTE:

- Verify that the variable intake air shutter valve actuator rod moves using a mirror.
- 4. Apply vacuum and verify that the rod moves.
    - If the rod does not move, replace the variable intake air shutter valve actuator. (See [VARIABLE INTAKE AIR SHUTTER VALVE ACTUATOR REMOVAL/INSTALLATION \[LF\]](#).)

Vacuum kPa {mmHg, inHg}	Rod movement
Below -2.7 {-21, -0.9}	Not operate
Above -33.4 {-251, -9.89}	Fully pulled



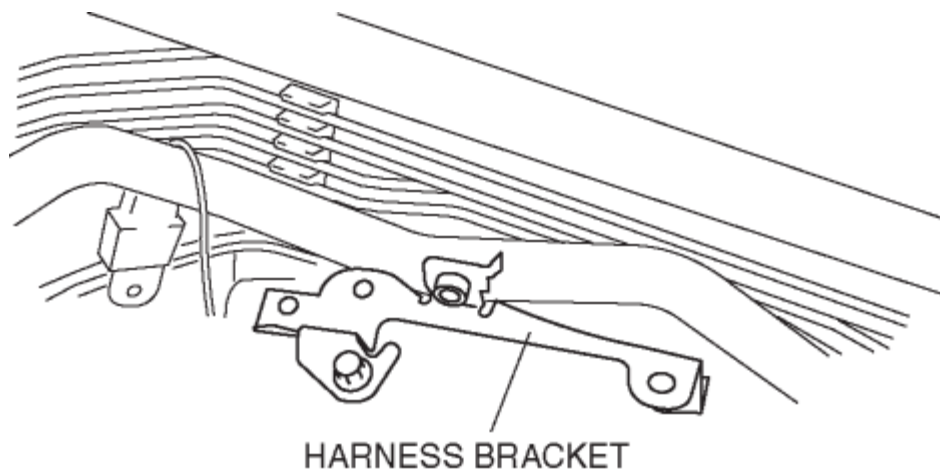
## 2008 - MX-5 - Engine

### VARIABLE INTAKE AIR SHUTTER VALVE ACTUATOR REMOVAL/INSTALLATION [LF]

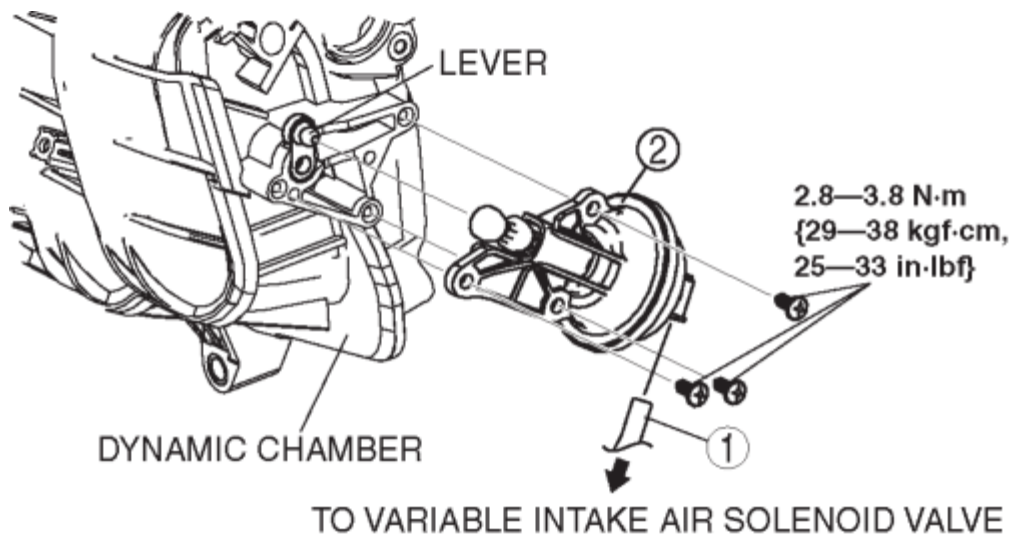
#### WARNING:

- A hot engine and intake-air system can cause severe burns. Turn off the engine and wait until they are cool before removing the intake-air system.
- Fuel line spills and leakage from the pressurized fuel system are dangerous. Fuel can ignite and cause serious injury or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure", while referring to the "BEFORE SERVICE PRECAUTIONS".

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the throttle body. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
4. Disconnect the quick release connector (Type A) (See [QUICK RELEASE CONNECTOR \(EMISSION SYSTEM\) REMOVAL/INSTALLATION \[LF\]](#).)
5. Remove the plug hole plate. (See [PLUG HOLE PLATE REMOVAL/INSTALLATION \[LF\]](#).)
6. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See [BEFORE SERVICE PRECAUTION \[LF\]](#).)
7. Remove the service hole cover.
  - a. Remove the front suspension tower bar (joint), (right side) and (left side). (See [FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION](#).)
  - b. Remove the wiper arm. (See [WIPER ARM AND BLADE REMOVAL/INSTALLATION](#).)
  - c. Remove the cowl grille. (See [COWL GRILLE REMOVAL/INSTALLATION](#).)
  - d. Remove the side cowl grille. (See [SIDE COWL GRILLE REMOVAL/INSTALLATION](#).)
  - e. Remove the service hole cover. (See [EGR VALVE REMOVAL/INSTALLATION \[LF\]](#).)
8. Remove the harness bracket.



9. Remove the under cover. (See [TRANSVERSE MEMBER REMOVAL/INSTALLATION](#).)
10. Disconnect the quick release connector from the fuel distributor. (See [QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION \[LF\]](#).)
11. Remove the fuel distributor. (See [FUEL INJECTOR REMOVAL/INSTALLATION \[LF\]](#).)
12. Move the clutch release cylinder slightly out of the way. (MT) (See [CLUTCH RELEASE CYLINDER REMOVAL/INSTALLATION](#).)
13. Remove the dynamic chamber. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
14. Remove in the order indicated in the table.



1	Vacuum hose
2	Variable intake air shutter valve actuator (See <a href="#">VARIABLE INTAKE AIR SHUTTER VALVE ACTUATOR REMOVAL/INSTALLATION [LF]</a> .) (See <a href="#">VARIABLE INTAKE AIR SHUTTER VALVE ACTUATOR REMOVAL/INSTALLATION [LF]</a> .)

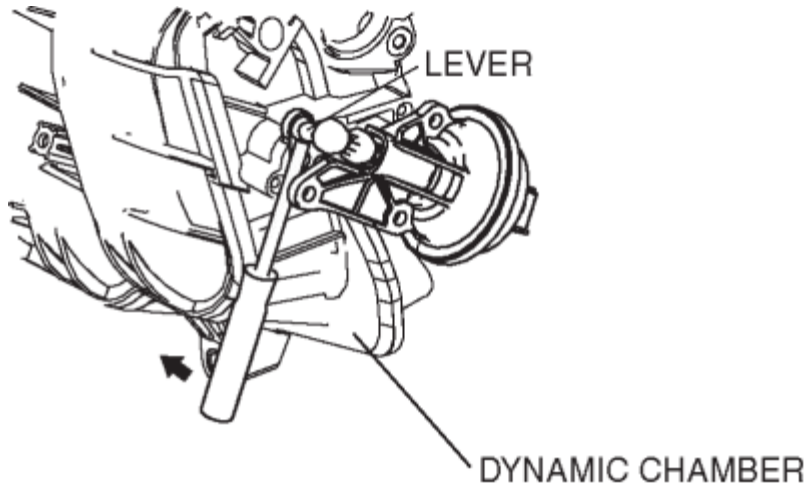
15. Install in the reverse order of removal.

### Variable Intake Air Shutter Valve Actuator Removal Note

1. Disengage the variable intake air shutter valve actuator rod from the dynamic chamber on the opposite side using a suitable screwdriver or equivalent tool as shown in the figure.

#### CAUTION:

- Do not remove the lever, otherwise the variable intake air shutter valve opening angle will deviate. To prevent removal of the lever when removing the variable intake shutter valve actuator, press the lever firmly to the dynamic chamber side by hand.



### Variable Intake Air Shutter Valve Actuator Installation Note

1. Press the variable intake air shutter valve actuator rod into the dynamic chamber on the opposite side until a click is heard, and install it.

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## 2008 - MX-5 - Engine

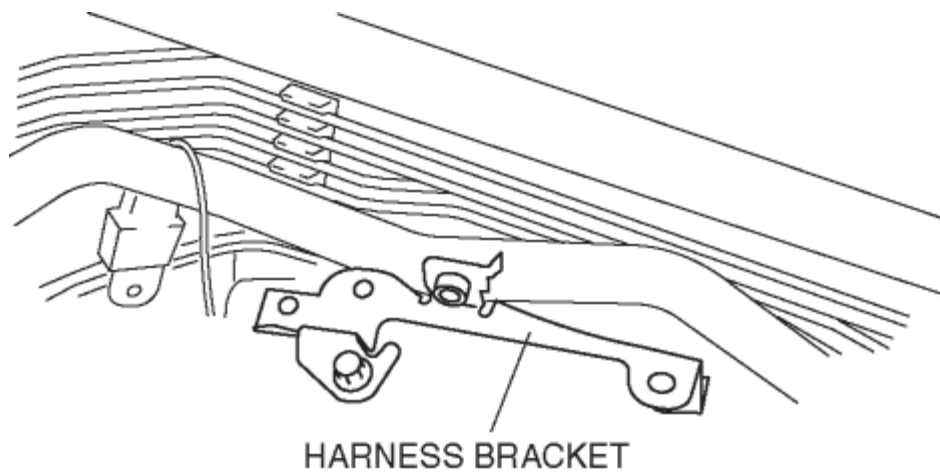
### VARIABLE TUMBLE SHUTTER VALVE ACTUATOR REMOVAL/INSTALLATION [LF]

#### AT

#### WARNING:

- A hot engine and intake-air system can cause severe burns. Turn off the engine and wait until they are cool before removing the intake-air system.
- Fuel line spills and leakage from the pressurized fuel system are dangerous. Fuel can ignite and cause serious injury or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure", while referring to the "BEFORE SERVICE PRECAUTIONS".

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the throttle body. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
4. Disconnect the quick release connector. (See [QUICK RELEASE CONNECTOR \(EMISSION SYSTEM\) REMOVAL/INSTALLATION \[LF\]](#).)
5. Remove the plug hole plate. (See [PLUG HOLE PLATE REMOVAL/INSTALLATION \[LF\]](#).)
6. Remove the service hole cover.
  - a. Remove the front suspension tower bar (joint), (right side) and (left side). (See .)
  - b. Remove the wiper arm. (See [WIPER ARM AND BLADE REMOVAL/INSTALLATION](#).)
  - c. Remove the cowl grille. (See [COWL GRILLE REMOVAL/INSTALLATION](#).)
  - d. Remove the side cowl grille. (See [SIDE COWL GRILLE REMOVAL/INSTALLATION](#).)
  - e. Remove the service hole cover. (See [EGR VALVE REMOVAL/INSTALLATION \[LF\]](#).)
7. Remove the harness bracket.



8. Remove the under cover. (See .)

9. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See [BEFORE SERVICE PRECAUTION \[LF\]](#).)

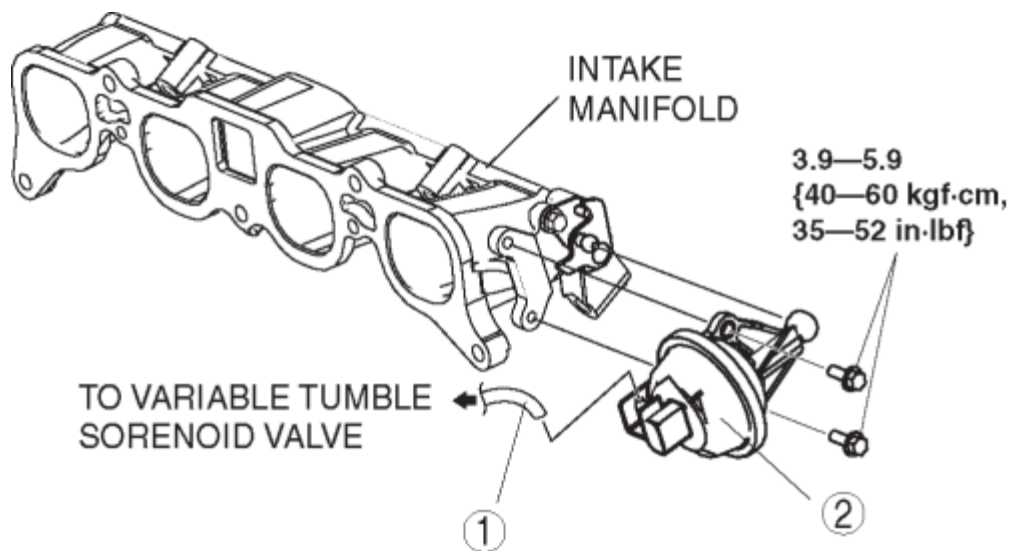
10. Disconnect the quick release connector from the fuel distributor. (See [QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION \[LF\]](#).)

11. Remove the fuel distributor. (See [FUEL INJECTOR REMOVAL/INSTALLATION \[LF\]](#).)

12. Remove the dynamic chamber. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)

13. Remove the intake manifold. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)

14. Remove in the order indicated in the table.

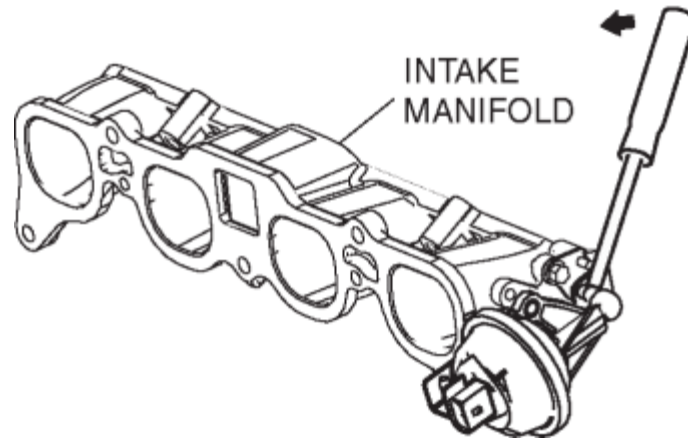


1	Vacuum hose
	Variable tumble shutter valve actuator
2	(See <a href="#">Variable Tumble Shutter Valve Actuator Removal Note</a> .)
	(See <a href="#">Variable Tumble Shutter Valve Actuator Installation Note</a> .)

15. Install in the reverse order of removal.

#### **Variable Tumble Shutter Valve Actuator Removal Note**

1. Disengage the variable tumble shutter valve actuator rod from the intake manifold using a suitable screwdriver or equivalent tool as shown in the figure.



#### **Variable Tumble Shutter Valve Actuator Installation Note**

1. Press the variable tumble shutter valve actuator into the variable tumble shutter valve actuator rod and the intake manifold on the opposite side until a click is heard, and install it.

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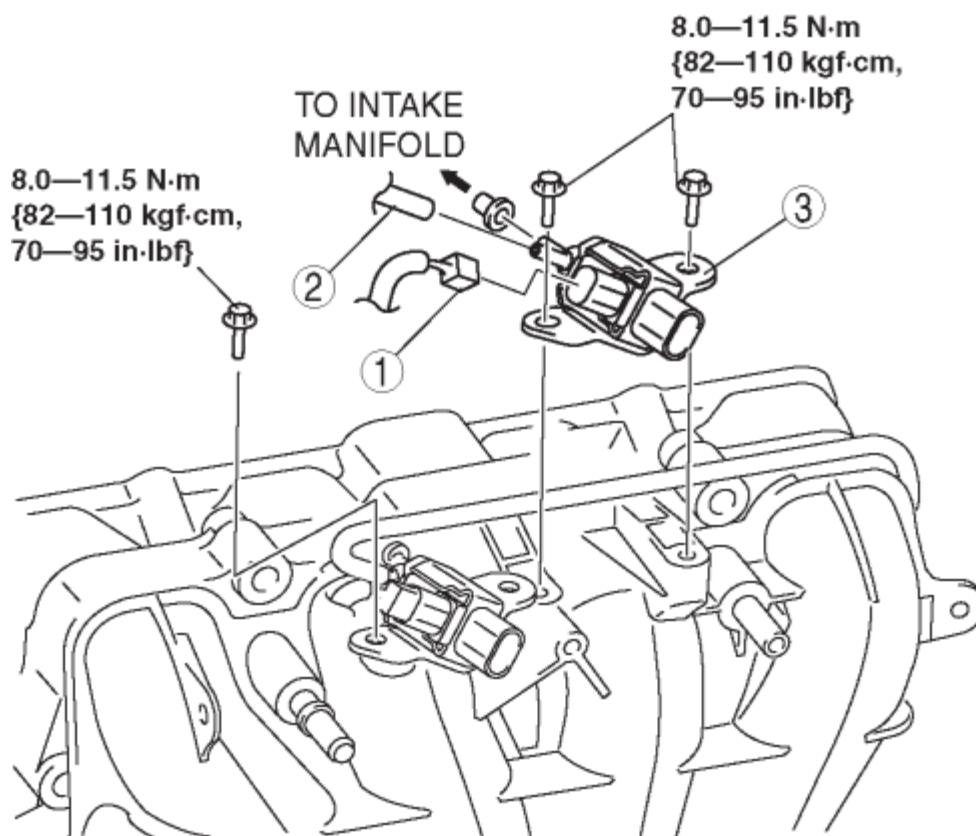
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## 2008 - MX-5 - Engine

### VARIABLE INTAKE AIR SOLENOID VALVE REMOVAL/INSTALLATION [LF]

1. Remove the plug hole plate. (See [PLUG HOLE PLATE REMOVAL/INSTALLATION \[LF\]](#).)
2. Remove the battery cover.
3. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
4. Move the variable tumble solenoid valve (AT), slightly out of the way. (See [VARIABLE TUMBLE SOLENOID VALVE REMOVAL/INSTALLATION \[LF\]](#).)
5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.



1	Connector
2	Vacuum hose
3	Variable intake air solenoid valve

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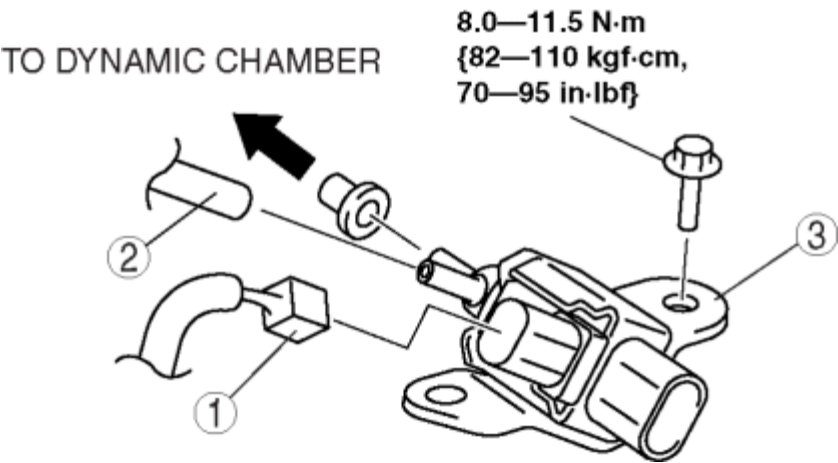
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2008 - MX-5 - Engine

VARIABLE TUMBLE SOLENOID VALVE REMOVAL/INSTALLATION [LF]

AT

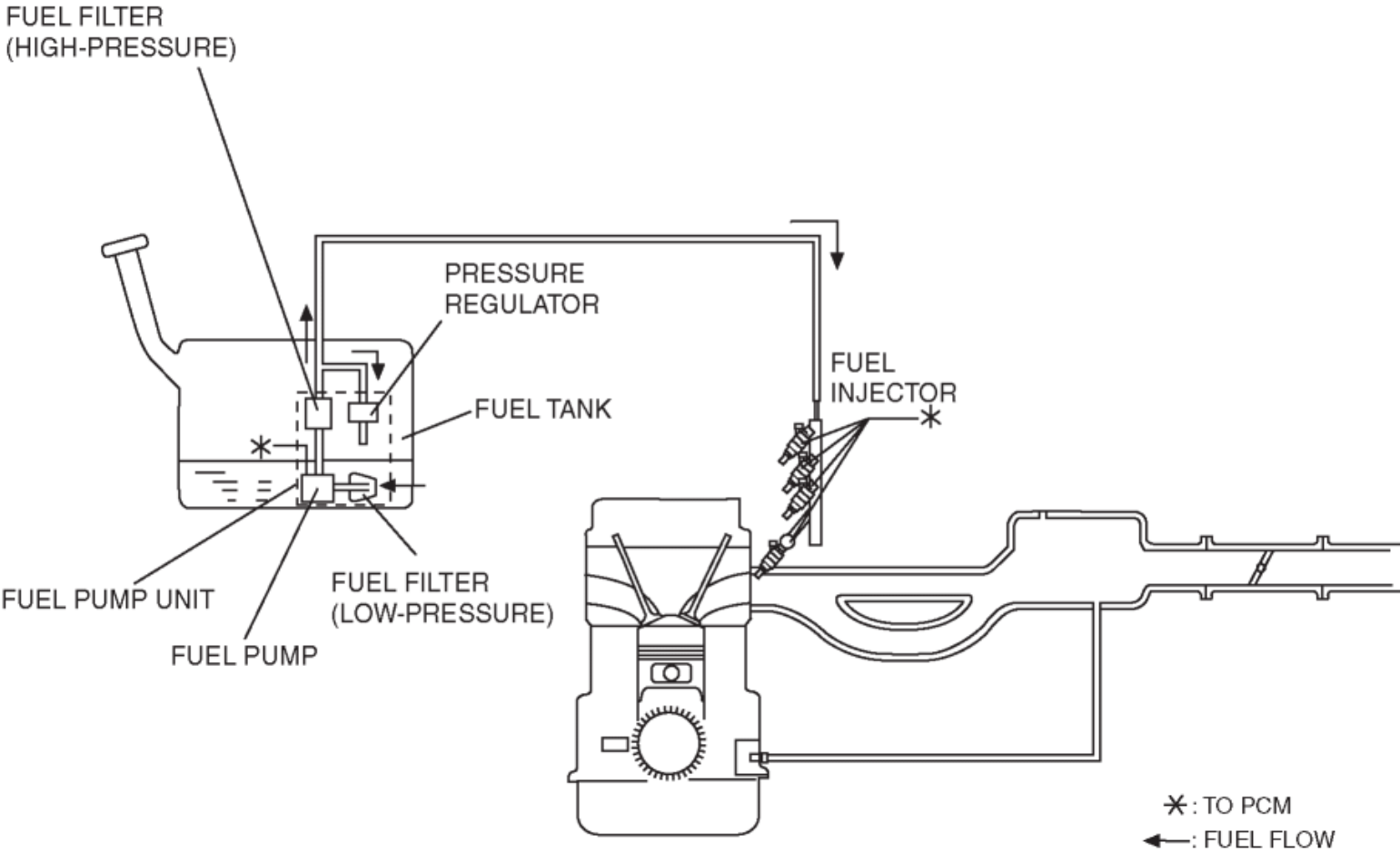
- 1. Remove the plug hole plate. (See [PLUG HOLE PLATE REMOVAL/INSTALLATION \[LF\]](#).)
- 2. Remove the battery cover.
- 3. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
- 4. Remove in the order indicated in the table.
- 5. Install in the reverse order of removal.



1	Connector
2	Vacuum hose
3	Variable tumble solenoid valve

2008 - MX-5 - Engine

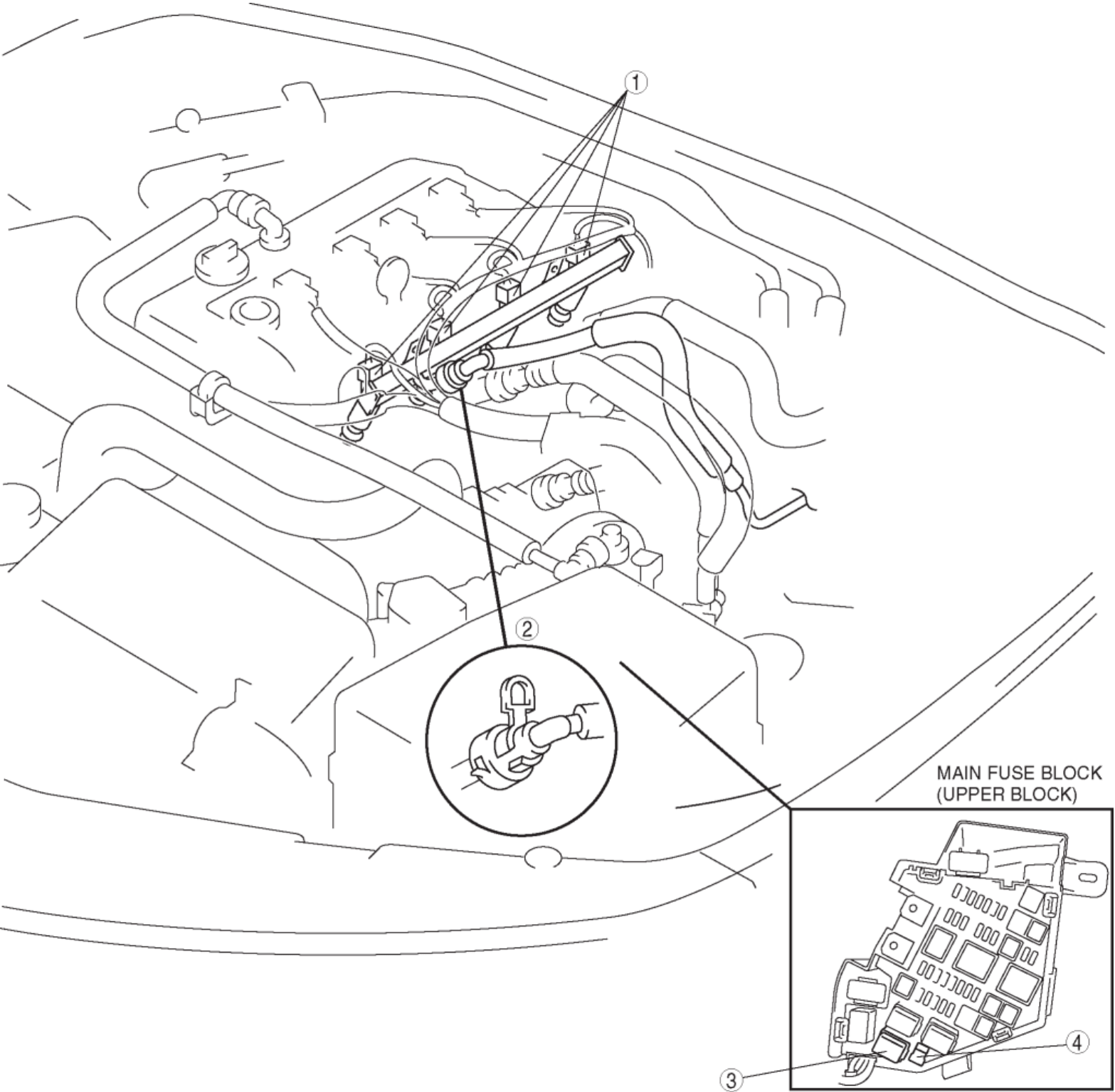
FUEL SYSTEM FLOW DIAGRAM [LF]



2008 - MX-5 - Engine

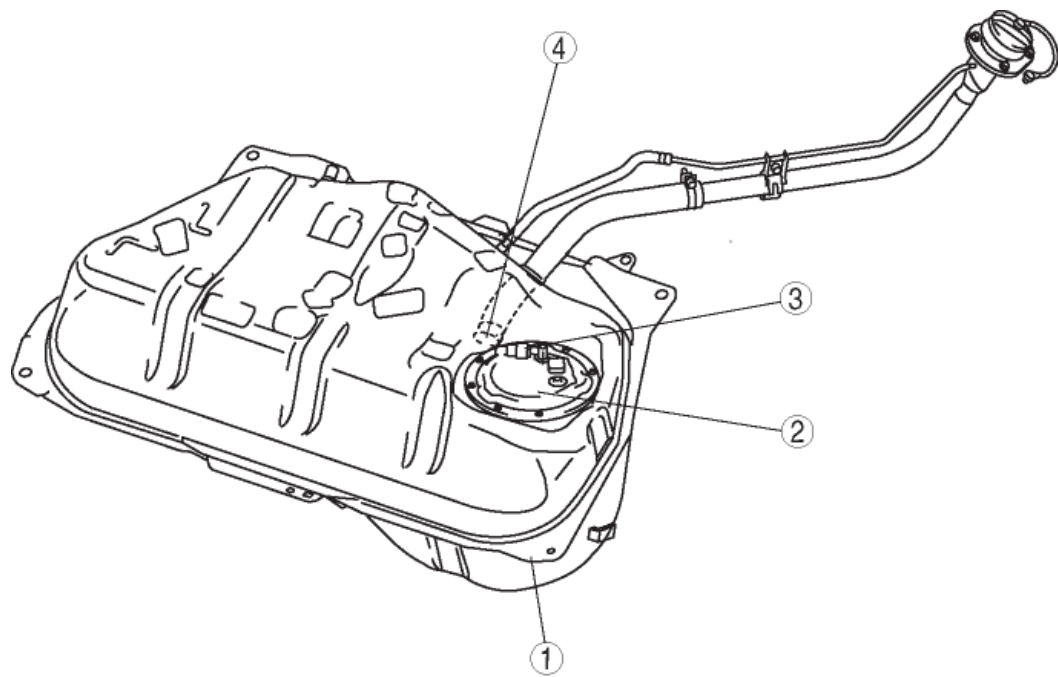
FUEL SYSTEM LOCATION INDEX [LF]

Engine Compartment Side



1	Fuel injector (See <a href="#">FUEL INJECTOR REMOVAL/INSTALLATION [LF].</a> ) (See <a href="#">FUEL INJECTOR INSPECTION [LF].</a> )
2	Quick release connector (Type A) (See <a href="#">QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION [LF].</a> )
3	Fuel pump relay
4	Check connector

Fuel Tank Side



1	Fuel tank (See <a href="#">FUEL TANK REMOVAL/INSTALLATION [LF].</a> ) (See <a href="#">FUEL TANK INSPECTION [LF].</a> )
2	Fuel pump unit (See <a href="#">FUEL PUMP UNIT REMOVAL/INSTALLATION [LF].</a> ) (See <a href="#">FUEL PUMP UNIT DISASSEMBLY/ASSEMBLY [LF].</a> ) (See <a href="#">FUEL PUMP UNIT INSPECTION [LF].</a> )
3	Quick release connector (Type B) (See <a href="#">QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION [LF].</a> )
4	Nonreturn valve (See <a href="#">NONRETURN VALVE INSPECTION [LF].</a> )



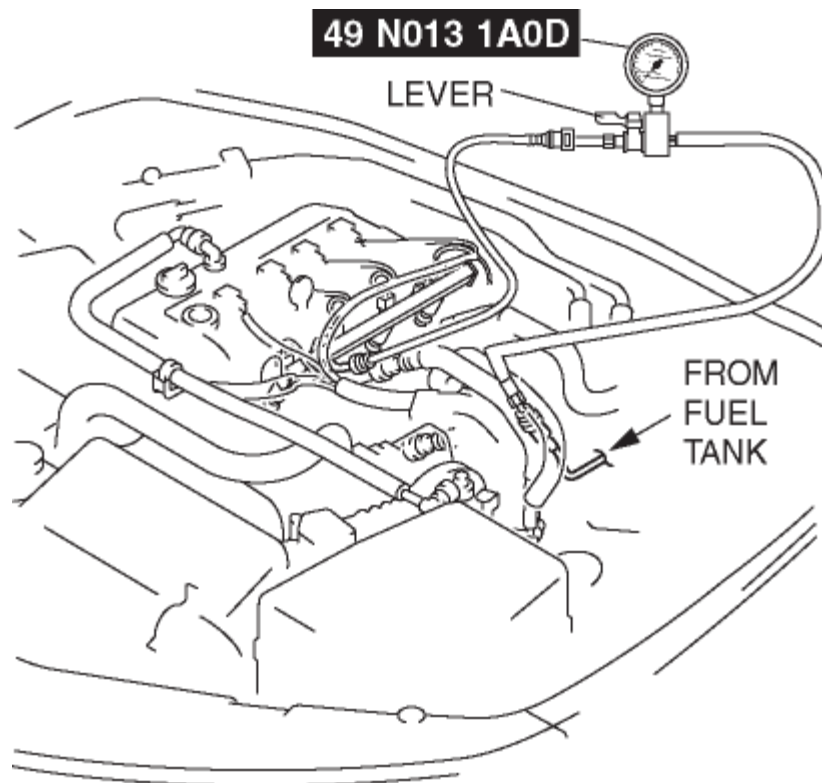
## 2008 - MX-5 - Engine

### FUEL LINE PRESSURE INSPECTION [LF]

#### WARNING:

- Fuel line spills and leakage from the pressurized fuel system are dangerous. Fuel can ignite and cause serious injury or death and damage. To prevent this, complete the following inspection with the engine stopped.

- Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See [BEFORE SERVICE PRECAUTION \[LF\]](#).)
  - Remove the battery cover. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
  - Disconnect the negative battery cable.
  - Disconnect the quick release connector (in the engine compartment).
- (See [QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION \[LF\]](#).)
- Turn the lever of the **SST** parallel to the hose as shown in the figure.

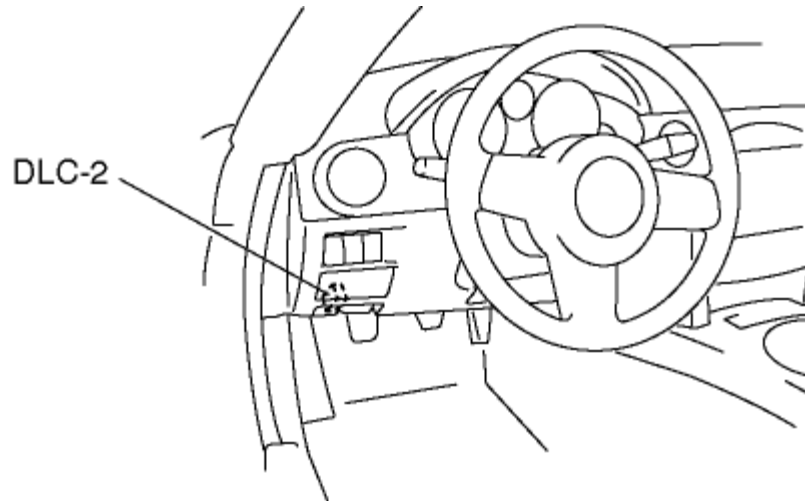


- Insert the **SST** quick release connector into the fuel pipe until a click is heard.
- Verify that the quick release connector is firmly connected by pulling it by hand.
- Start the fuel pump using the following procedure:

#### Using M-MDS



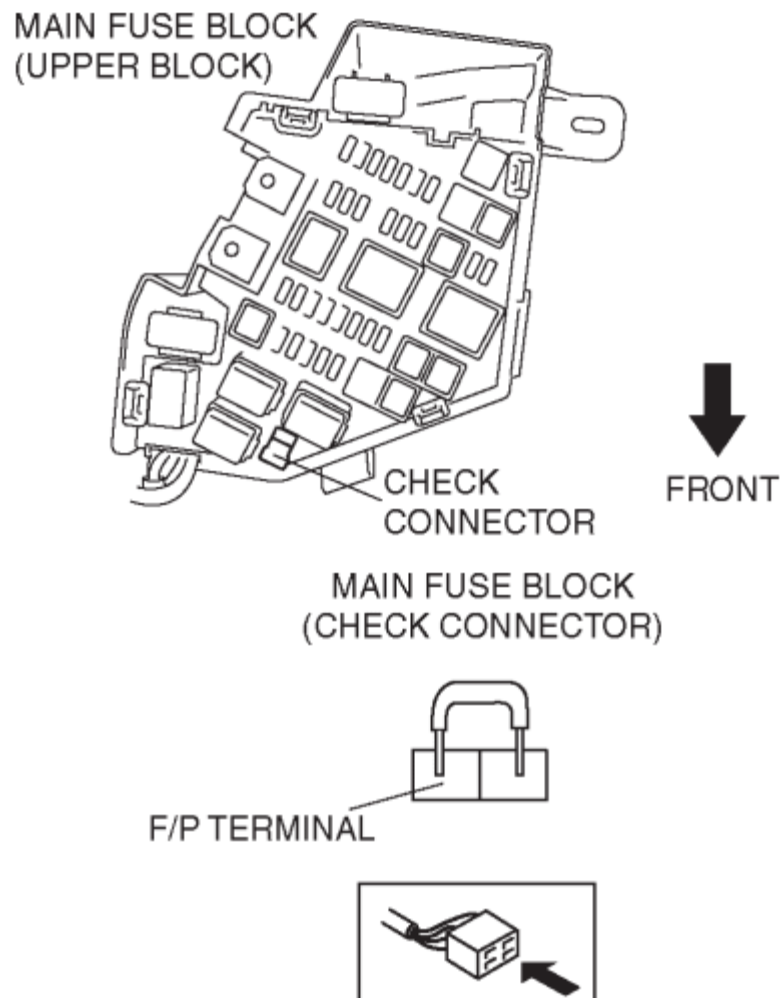
1. Connect the negative battery cable.
2. Connect the M-MDS to the DLC-2.



3. Start the fuel pump using the "FP" simulation function.

**Not using M-MDS**

1. Short the check connector terminal F/P to ground using a jumper wire.



2. Turn the ignition switch to the ON position to operate the fuel pump.

9. Operate the fuel pump for **10 s**.

10. Measure the fuel line pressure.

- If not within the specification, inspect the following:

**If it less than the specification:**

- Fuel pump unit
- Fuel line leakage

**If it exceeds the specification:**

- Fuel line clogging

**Fuel pressure (Reference)**

- 350—410 kPa {3.57—4.18 kgf/cm<sup>2</sup>, 50.8—59.4 psi}

11. Stop the fuel pump using the following procedure:

**Using M-MDS**

1. Stop the fuel pump using the “FP” simulation function.

**Not using M-MDS**

1. Turn the ignition switch to off to stop the fuel pump.

12. Measure the fuel hold pressure **after 5 min**.

- If not within the specification, inspect the following:
  - Fuel line for clogging or leakage

**Fuel hold pressure (Reference)**

- 250 kPa {2.55 kgf/cm<sup>2</sup>, 36.2 psi} or more

13. Follow “BEFORE SERVICE PRECAUTION” before performing any work operations to prevent fuel from spilling from the fuel system. (See **BEFORE SERVICE PRECAUTION [LF]**.)

14. Disconnect the **SST**.

15. Connect the quick release connector to the fuel distributor. (See **QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION [LF]**.)

16. Complete the “AFTER SERVICE PRECAUTION”. (See **AFTER SERVICE PRECAUTION [LF]**.)

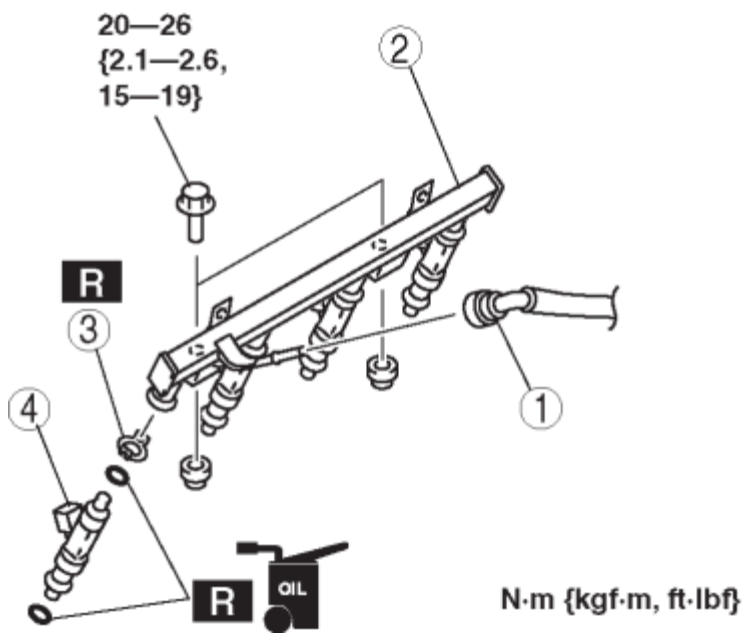
2008 - MX-5 - Engine

FUEL INJECTOR REMOVAL/INSTALLATION [LF]

WARNING:

- Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, always complete the “Fuel Line Safety Procedure”, while referring to the “BEFORE SERVICE PRECAUTION”.

- Follow “BEFORE SERVICE PRECAUTION” before performing any work operations to prevent fuel from spilling from the fuel system. (See [BEFORE SERVICE PRECAUTION \[LF\]](#).)
- Remove the plug hole plate. (See [PLUG HOLE PLATE REMOVAL/INSTALLATION \[LF\]](#).)
- Remove the battery cover.
- Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
- Disconnect the fuel injector connector and move the harness slightly out of the way.
- Remove in the order indicated in the table.



1	Quick release connector (Type A)  (See <a href="#">QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION [LF]</a> .)
2	Fuel distributor

3	Injector clip (See <b>FUEL INJECTOR REMOVAL/INSTALLATION [LF]</b> .)
4	Fuel injector (See <b>FUEL INJECTOR REMOVAL/INSTALLATION [LF]</b> .)

7. Install in the reverse order of removal.

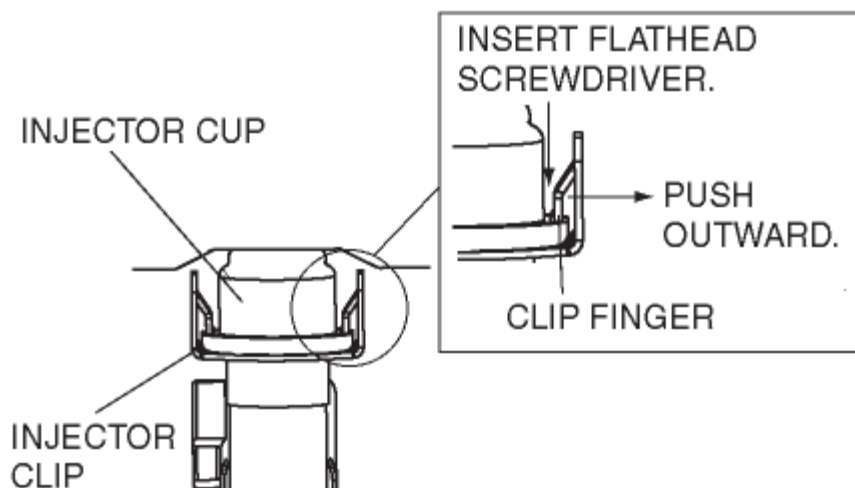
8. Complete the "AFTER SERVICE PRECAUTION". (See **AFTER SERVICE PRECAUTION [LF]**.)

## Fuel Injector Removal Note

### CAUTION:

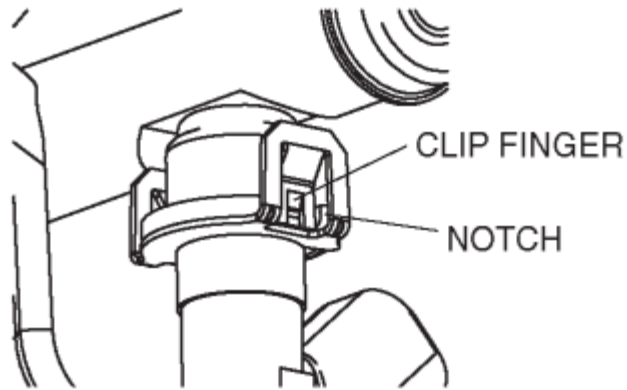
- Use of a deformed injector clip will cause the fuel injector to be connected incorrectly and could result in fuel leakage. It will also cause the injector to rotate. Therefore, always replace the clip when the injector is removed.

1. Insert a flathead screwdriver between the injector cup and clip finger.



### NOTE:

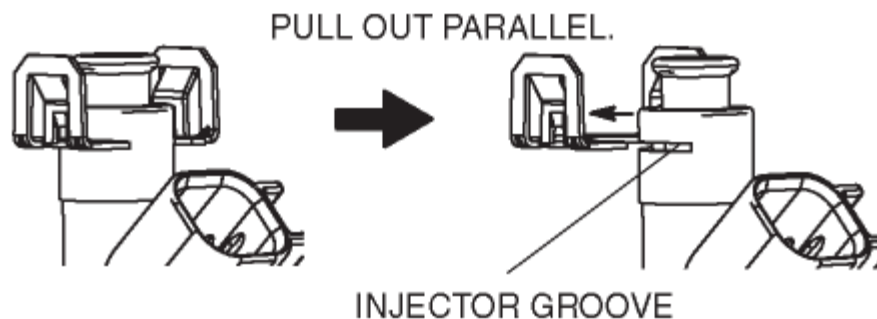
- When pushing the clip finger outward, deform the finger until it is removed completely from the cup notch.



2. Push the clip finger outward using a flathead screwdriver.
3. Remove the injector with the clip.
4. Remove the clip from the fuel injector using the following procedure:

**NOTE:**

- The clip will not be reused.
- a. Hold the clip using pliers.
  - b. Pull the clip parallel to the injector groove and remove it from the injector.

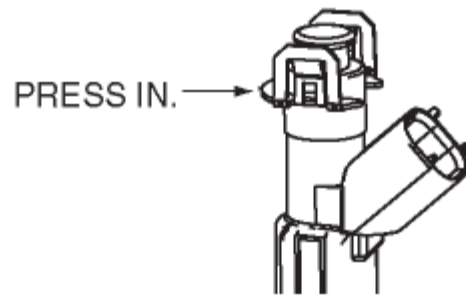


**Fuel Injector Installation Note**

1. Apply a small amount of clean oil to the injector groove and the O-ring.
2. Temporarily attach a new clip to the injector groove.

**NOTE:**

- When the clip is attached correctly, the central area of the injector and the clip finger positions are aligned.
3. Hold the injector firmly and push the clip into the injector until the clip stops sliding.



4. Verify that the injector connector position is correct.
5. Press the injector into the injector cup. Continue pressing until the clip contacts the lower surface of the injector cup.
6. Verify that the injector and clip are correctly installed with the clip locked onto the injector cup notch.

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## 2008 - MX-5 - Engine

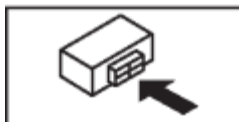
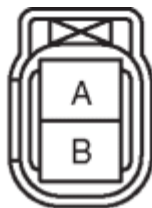
### FUEL INJECTOR INSPECTION [LF]

#### NOTE:

- Perform the following inspection only when directed.

#### Resistance Inspection

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Disconnect the fuel injector connector.
4. Inspect the resistance between fuel injector terminals A and B using a tester.



- If within the specification, perform the "Circuit Open/Short Inspection".
- If not within the specification, replace the fuel injector. (See [FUEL INJECTOR REMOVAL/INSTALLATION \[LF\]](#).)

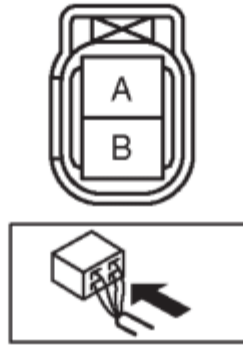
#### Fuel injector resistance

- 11.4—12.6 ohms [20 °C {68 °F}]

#### Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See [PCM REMOVAL/INSTALLATION \[LF\]](#).)
2. Inspect the following wiring harnesses for open or short circuit (continuity check).

## FUEL INJECTOR WIRING HARNESS-SIDE CONNECTOR



## PCM WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



### Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - Fuel injector No.1 terminal B and PCM terminal 2BB
  - Fuel injector No.2 terminal B and PCM terminal 2BC
  - Fuel injector No.3 terminal B and PCM terminal 2BD
  - Fuel injector No.4 terminal B and PCM terminal 2AZ
  - Fuel injector No.1 terminal A and main relay
  - Fuel injector No.2 terminal A and main relay
  - Fuel injector No.3 terminal A and main relay
  - Fuel injector No.4 terminal A and main relay

### Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - Fuel injector No.1 terminal B and body ground
  - Fuel injector No.1 terminal B and power supply



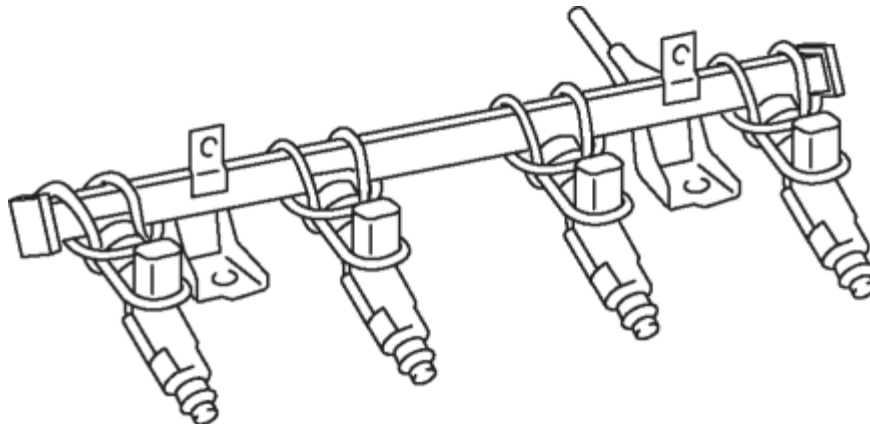
- Fuel injector No.2 terminal B and body ground
- Fuel injector No.2 terminal B and power supply
- Fuel injector No.3 terminal B and body ground
- Fuel injector No.3 terminal B and power supply
- Fuel injector No.4 terminal B and body ground
- Fuel injector No.4 terminal B and power supply
- Fuel injector No.1 terminal A and body ground
- Fuel injector No.2 terminal A and body ground
- Fuel injector No.3 terminal A and body ground
- Fuel injector No.4 terminal A and body ground

## Leakage Inspection

### WARNING:

- Fuel line spills and leakage from the pressurized fuel system are dangerous. Fuel can ignite and cause serious injury or death and damage. To prevent this, complete the following inspection with the engine stopped.

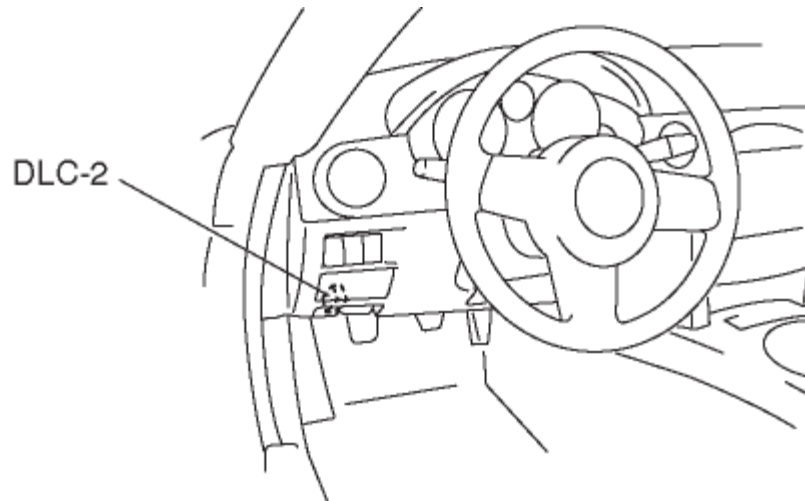
1. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See **BEFORE SERVICE PRECAUTION [LF].**)
2. Remove the battery cover.
3. Disconnect the negative battery cable. (See **BATTERY REMOVAL/INSTALLATION [LF].**)
4. Remove the fuel injector and fuel distributor as a single unit. (See **FUEL INJECTOR REMOVAL/INSTALLATION [LF].**)
5. Fix the fuel injector to the fuel distributor with a wire or the equivalent.



6. Connect the fuel hose.
7. Start the fuel pump using the following procedure:

### Using M-MDS

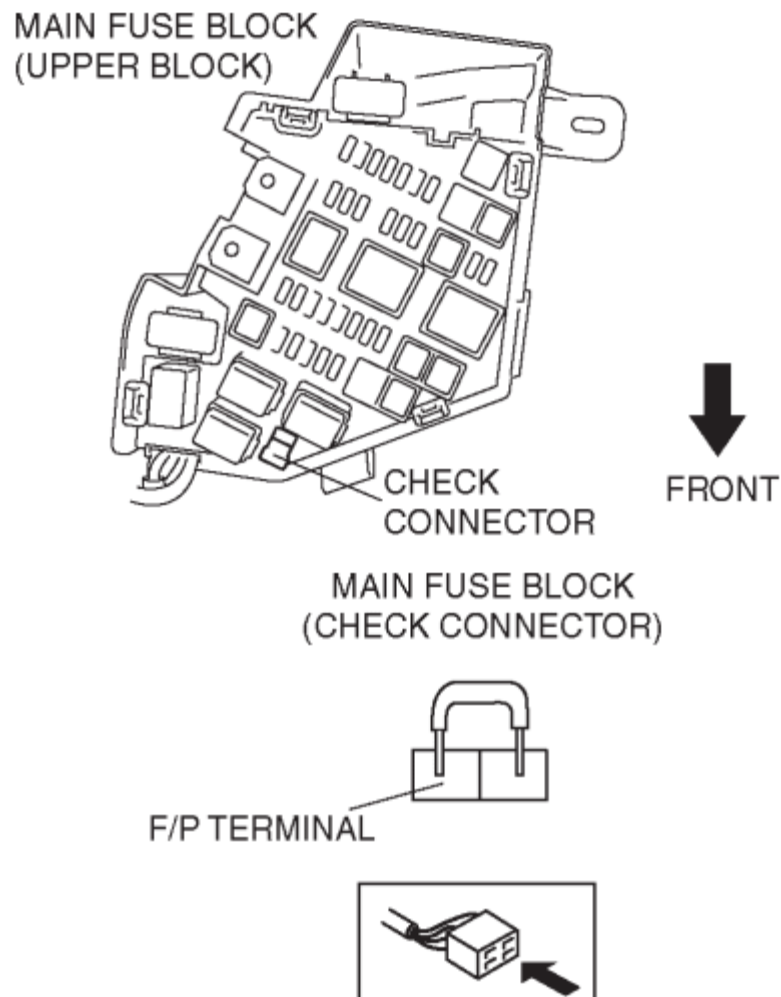
- Connect the negative battery cable.
- Connect the M-MDS to the DLC-2.



- Start the fuel pump using the "FP" simulation function.

**Not using M-MDS**

- Short the check connector terminal F/P to ground using a jumper wire.

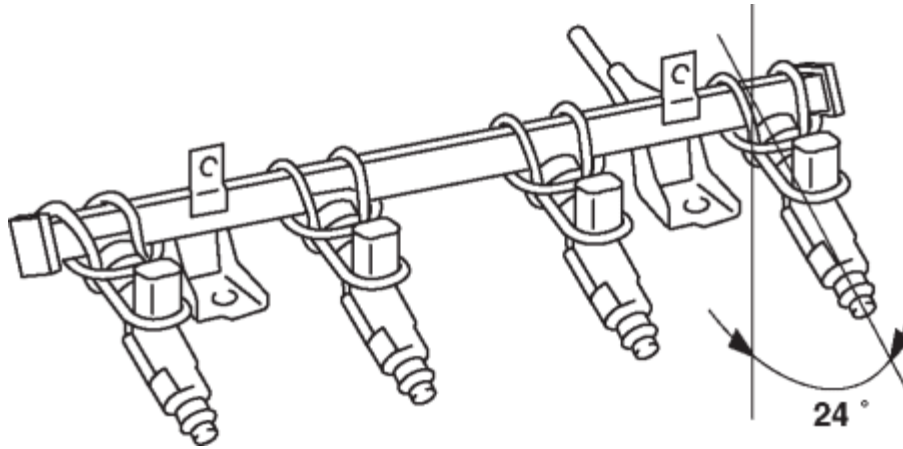


- Turn the ignition switch to the ON position to operate the fuel pump.

**NOTE:**

- Prepare a container to collect the gasoline.

8. Tilt the fuel injector at an angle of **24°** to inspect for leakage.



- If not within the specification, replace the fuel injector. (See [FUEL INJECTOR REMOVAL/INSTALLATION \[LF\]](#).)

#### **Fuel injector leakage amount**

- Less than 1 drop/2 min

9. Stop the fuel pump using the following procedure:

#### **Using M-MDS**

- Stop the fuel pump using the "FP" simulation function.

#### **Not using M-MDS**

- Turn the ignition switch to off to stop the fuel pump.

10. Remove the battery cover.

11. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)

12. Remove the wire or equivalent securing the fuel injector.

13. Install the fuel injector. (See [FUEL INJECTOR REMOVAL/INSTALLATION \[LF\]](#).)

14. Complete the "AFTER SERVICE PRECAUTION". (See [AFTER SERVICE PRECAUTION \[LF\]](#).)

## **Injection Volume Inspection**

### **WARNING:**

- Fuel line spills and leakage from the pressurized fuel system are dangerous. Fuel can ignite and cause serious injury or death and damage. To prevent this, complete the following inspection with the engine stopped.

1. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See [BEFORE SERVICE PRECAUTION \[LF\]](#).)

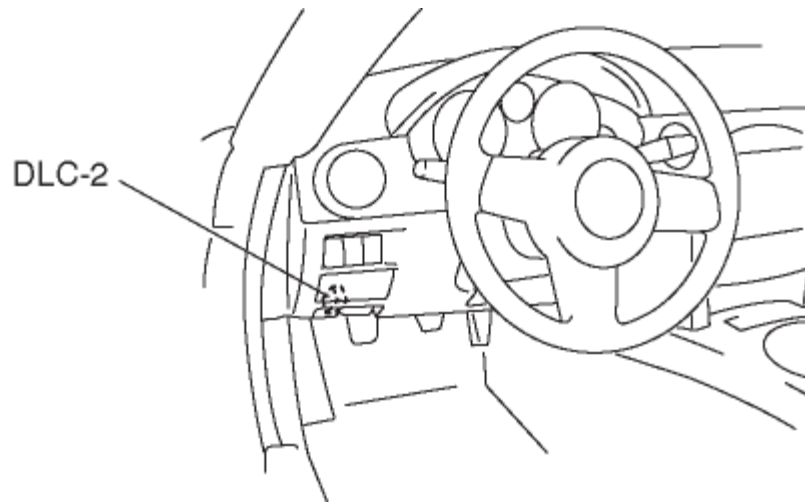
2. Remove the battery cover.

3. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)

4. Remove the fuel injector. (See [FUEL INJECTOR REMOVAL/INSTALLATION \[LF\]](#).).
5. Connect the fuel injector to the fuel injector tester.
6. Start the fuel pump using the following procedure:

**Using M-MDS**

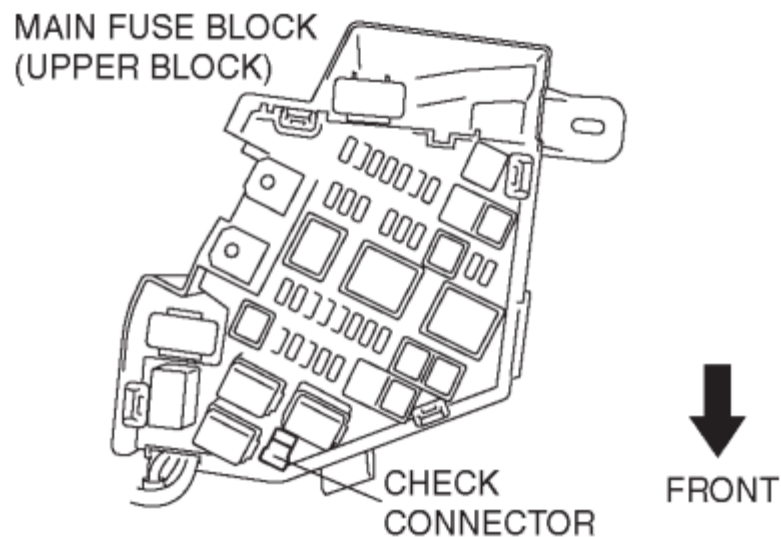
- Connect the negative battery cable.
- Connect the M-MDS to the DLC-2.



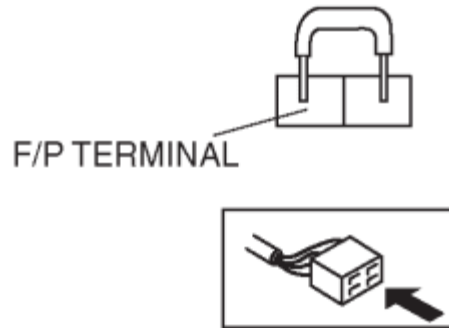
- Start the fuel pump using the "FP" simulation function.

**Not using M-MDS**

- Short the check connector terminal F/P to ground using a jumper wire.



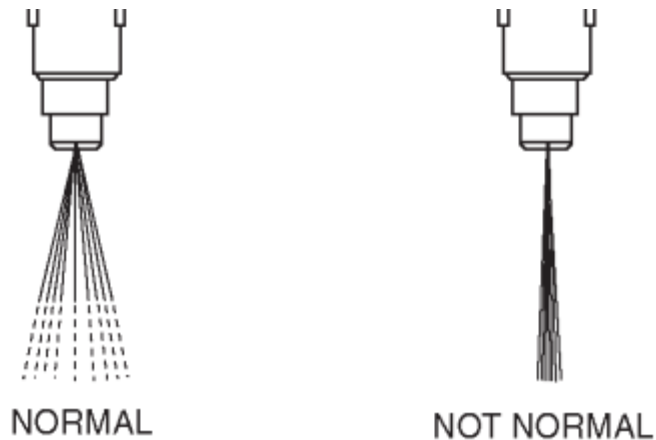
MAIN FUSE BLOCK  
(CHECK CONNECTOR)



- Turn the ignition switch to the ON position to operate the fuel pump.
7. Measure the injection volume of each fuel injector.
1. If not within the specification, replace the fuel injector. (See **FUEL INJECTOR REMOVAL/INSTALLATION [LF]**.)
- Fuel injection volume  
204—216 ml {204—216 cc, 12.5—13.1 cu in}/min
8. Turn the ignition switch to off to stop the fuel pump.
9. Install the fuel injector. (See **FUEL INJECTOR REMOVAL/INSTALLATION [LF]**.)
10. Complete the "AFTER SERVICE PRECAUTION". (See **AFTER SERVICE PRECAUTION [LF]**.)

## Atomization Inspection

1. Inspect the atomization status.



- If not normal, replace the fuel injector. (See **FUEL INJECTOR REMOVAL/INSTALLATION [LF]**.)

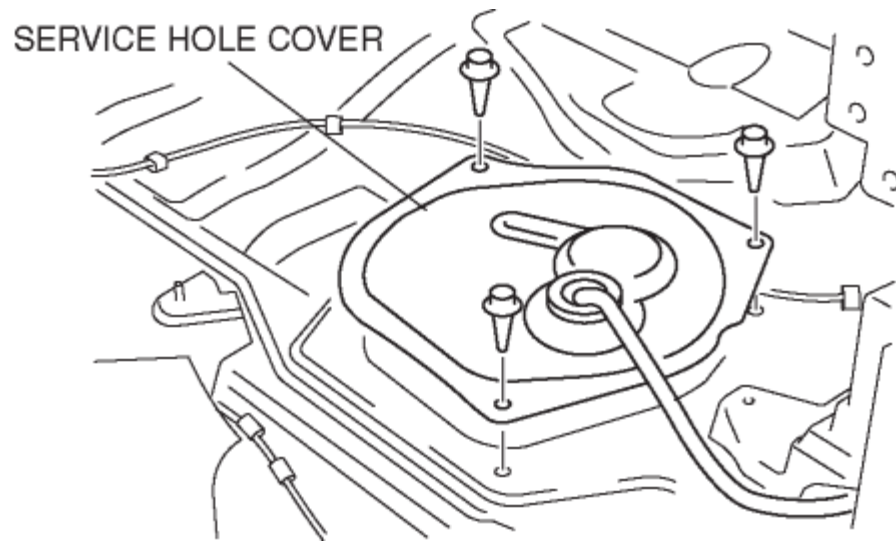
## 2008 - MX-5 - Engine

### FUEL PUMP UNIT REMOVAL/INSTALLATION [LF]

#### WARNING:

- Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure", while referring to "BEFORE SERVICE PRECAUTION".
- Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, before performing the fuel pump unit removal/installation, always complete the "Fuel Leak Inspection After Fuel Pump Unit Installation".

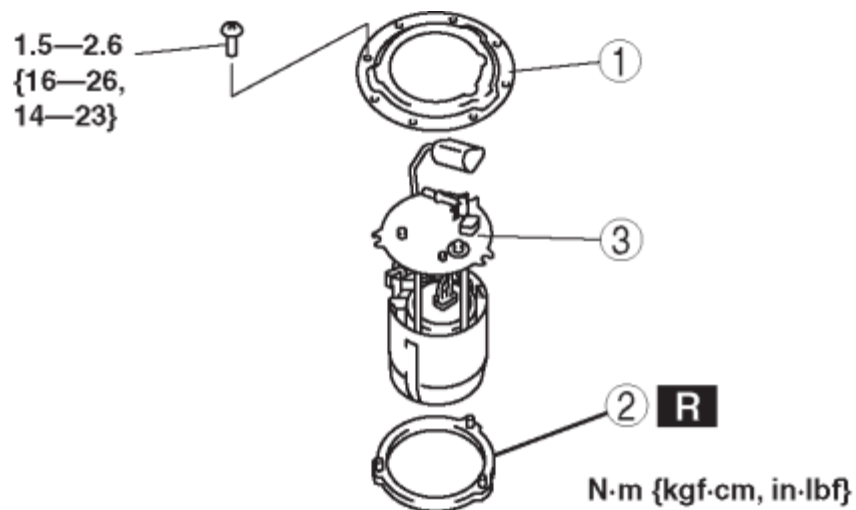
1. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See [BEFORE SERVICE PRECAUTION \[LF\]](#).)
2. Remove the battery cover.
3. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
4. Perform the following procedure to remove the service hole cover.
  - a. To remove the back trim, remove the following parts:
    - i. Console (See [CONSOLE REMOVAL/INSTALLATION](#).)
    - ii. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION](#).)
    - iii. Scuff plate ([SCUFF PLATE REMOVAL/INSTALLATION](#).)
    - iv. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION](#).)
    - v. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION](#).)
    - vi. Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION](#).)
  - b. Remove the back trim. (See [BACK TRIM REMOVAL/INSTALLATION](#).)
  - c. Remove the service hole cover.



5. Disconnect the quick release connector from the fuel pump unit. (See [QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION \[LF\]](#).)

6. Disconnect the fuel pump unit connector.

7. Remove in the order indicated in the table.



1	Plate
2	Packing
3	Fuel pump unit (See <a href="#">FUEL PUMP UNIT REMOVAL/INSTALLATION [LF]</a> .)

8. Install in the reverse order of removal.

9. Complete the "AFTER SERVICE PRECAUTION". (See [AFTER SERVICE PRECAUTION \[LF\]](#).)

## Fuel Leakage Inspection After Pump Unit Installation

1. Before installing the fuel tank, verify that there is no leakage when a pressure of **5.9 kPa {44 mmHg, 1.7 inHg}** is applied to the fuel tank.
2. Install the fuel tank. (See [FUEL TANK REMOVAL/INSTALLATION \[LF\]](#).)
3. Drive the vehicle starting from a standstill and brake suddenly **five to six times** at a low speed.
4. Stop the vehicle and verify from outside the vehicle that there is no fuel leakage around the fuel pump unit.

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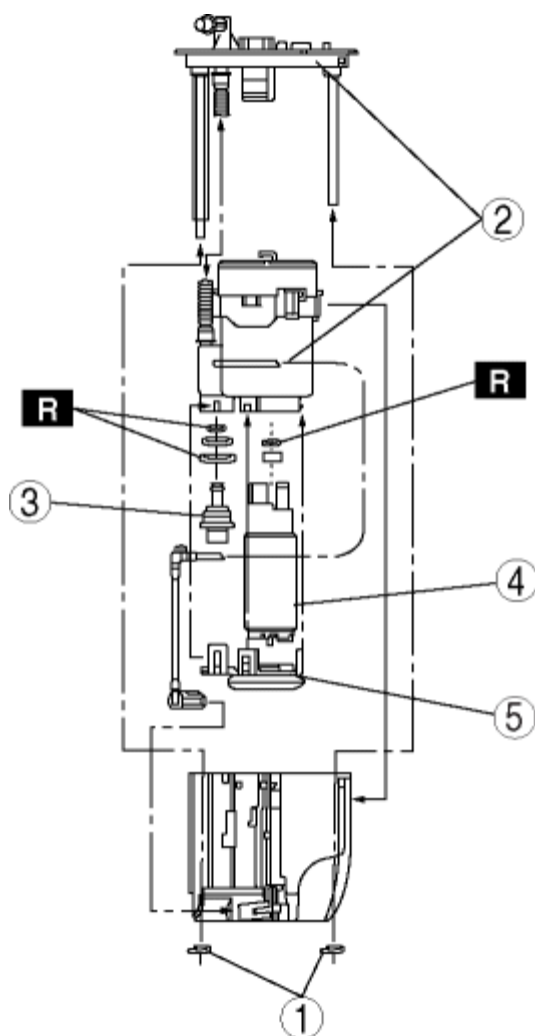
## 2008 - MX-5 - Engine

### FUEL PUMP UNIT DISASSEMBLY/ASSEMBLY [LF]

#### WARNING:

- Fuel line spills and leakage are dangerous. Fuel can ignite and cause serious injuries or death and damage. Fuel can also irritate skin and eyes. To prevent this, do not damage the sealing surface of the fuel pump unit when removing or installing.

- Disassemble in the order indicated in the table.
- Assemble in the reverse order of disassembly.



1	E-ring
2	Fuel filter body

3	Fuel pressure regulator
4	Fuel pump
5	Fuel filter (low-pressure)

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## 2008 - MX-5 - Engine

### FUEL PUMP UNIT INSPECTION [LF]

#### WARNING:

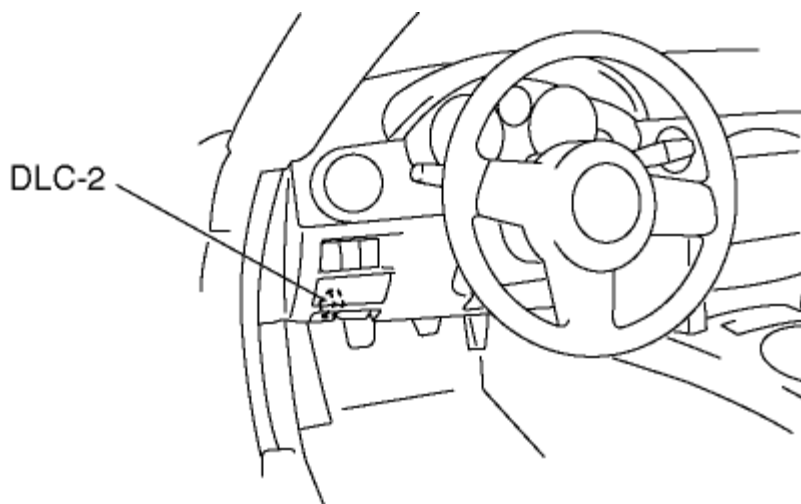
- Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure", while referring to "BEFORE SERVICE PRECAUTION".
- Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, before performing the fuel pump unit removal/installation, always complete the "Fuel Leak Inspection After Fuel Pump Unit Installation".
- A person charged with static electricity could cause a fire or explosion, resulting in death or serious injury. Before draining fuel, make sure to discharge static electricity by touching the vehicle body.

#### Fuel Pump Operation Inspection

1. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See [BEFORE SERVICE PRECAUTION \[LF\]](#).)
2. Remove the fuel-filler cap.
3. Start the fuel pump using the following procedure:

##### Using M-MDS

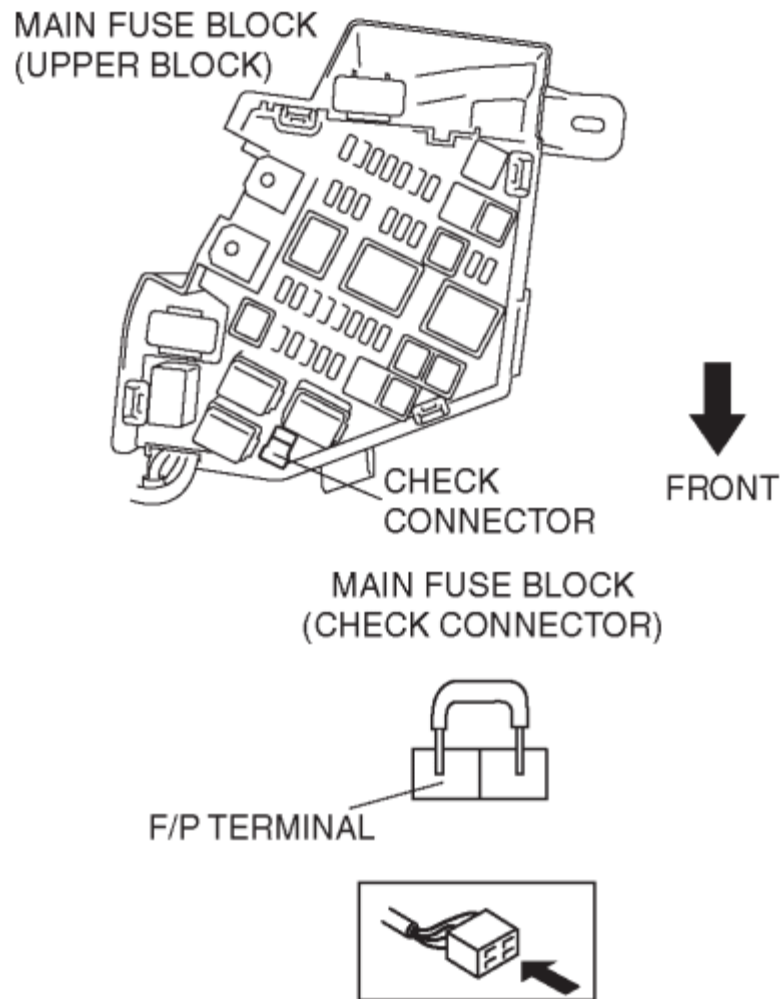
- Connect the M-MDS to the DLC-2.



- Start the fuel pump using the "FP" simulation function.

##### Not using M-MDS

- Short the check connector terminal F/P to ground using a jumper wire.

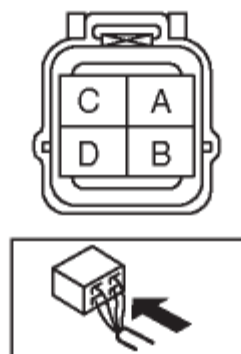


- Turn the ignition switch to the ON position to operate the fuel pump.

4. Verify that operation sound is heard from the fuel pump.

- If the operation sound cannot be verified, measure the voltage at fuel pump unit wiring harness-side connector terminal B.

#### FUEL PUMP UNIT WIRING HARNESS-SIDE CONNECTOR



- If as specified, inspect the following:
  - Fuel pump unit continuity
- If not within the specification, inspect the following:

- Fuel pump unit relay
- Wiring harnesses and connectors between main relay and fuel pump relay
- Wiring harnesses and connectors between fuel pump relay and PCM
- Wiring harnesses and connectors between battery and fuel pump relay
- Wiring harnesses and connectors between fuel pump relay and fuel pump unit

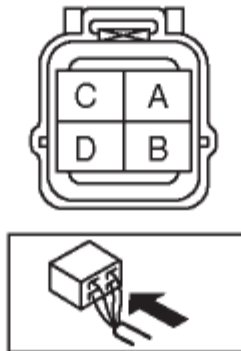
### Standard

- B+ (Ignition switch at ON)

### Continuity Inspection

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Disconnect the fuel pump unit connector. (See [FUEL PUMP UNIT REMOVAL/INSTALLATION \[LF\]](#).)
4. Inspect for continuity between fuel pump unit terminals B and D.

#### FUEL PUMP UNIT WIRING HARNESS-SIDE CONNECTOR

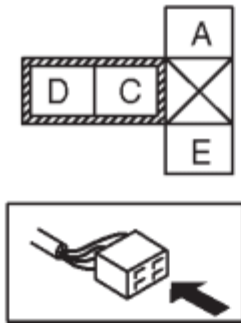


- If there is continuity, perform the "Circuit Open/Short Inspection".
- If there is no continuity, replace the fuel pump. (See [FUEL PUMP UNIT DISASSEMBLY/ASSEMBLY \[LF\]](#).)

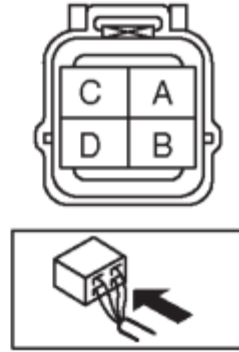
### Circuit Open/Short Inspection

1. Inspect the following wiring harnesses for an open or short circuit (continuity check).

### FUEL PUMP RELAY WIRING HARNESS-SIDE CONNECTOR



### FUEL PUMP UNIT WIRING HARNESS-SIDE CONNECTOR



#### Open circuit

- If there is no continuity, the circuit is open. Repair or replace the harness.
  - Fuel pump unit terminal D and body ground

### Fuel Static Pressure Inspection

#### NOTE:

- The fuel static pressure inspection cannot be performed because the pressure regulator is integrated with the fuel pump unit.

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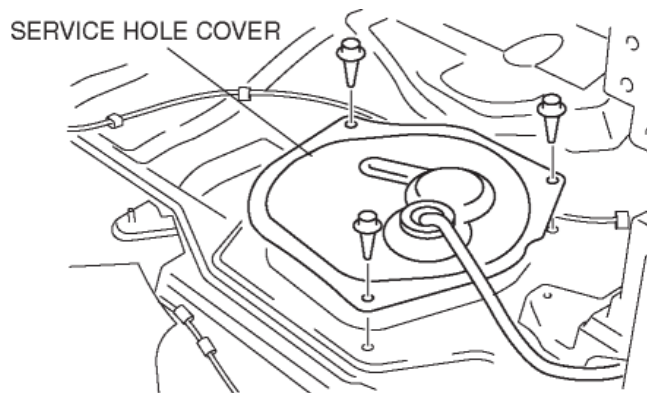
## 2008 - MX-5 - Engine

### FUEL TANK REMOVAL/INSTALLATION [LF]

#### WARNING:

- Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure", while referring to "BEFORE SERVICE PRECAUTION".
- Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, before performing the fuel pump unit removal/installation, always complete the "Fuel Leak Inspection After Fuel Pump Unit Installation".
- A person charged with static electricity could cause a fire or explosion, resulting in death or serious injury. Before draining fuel, make sure to discharge static electricity by touching the vehicle body.

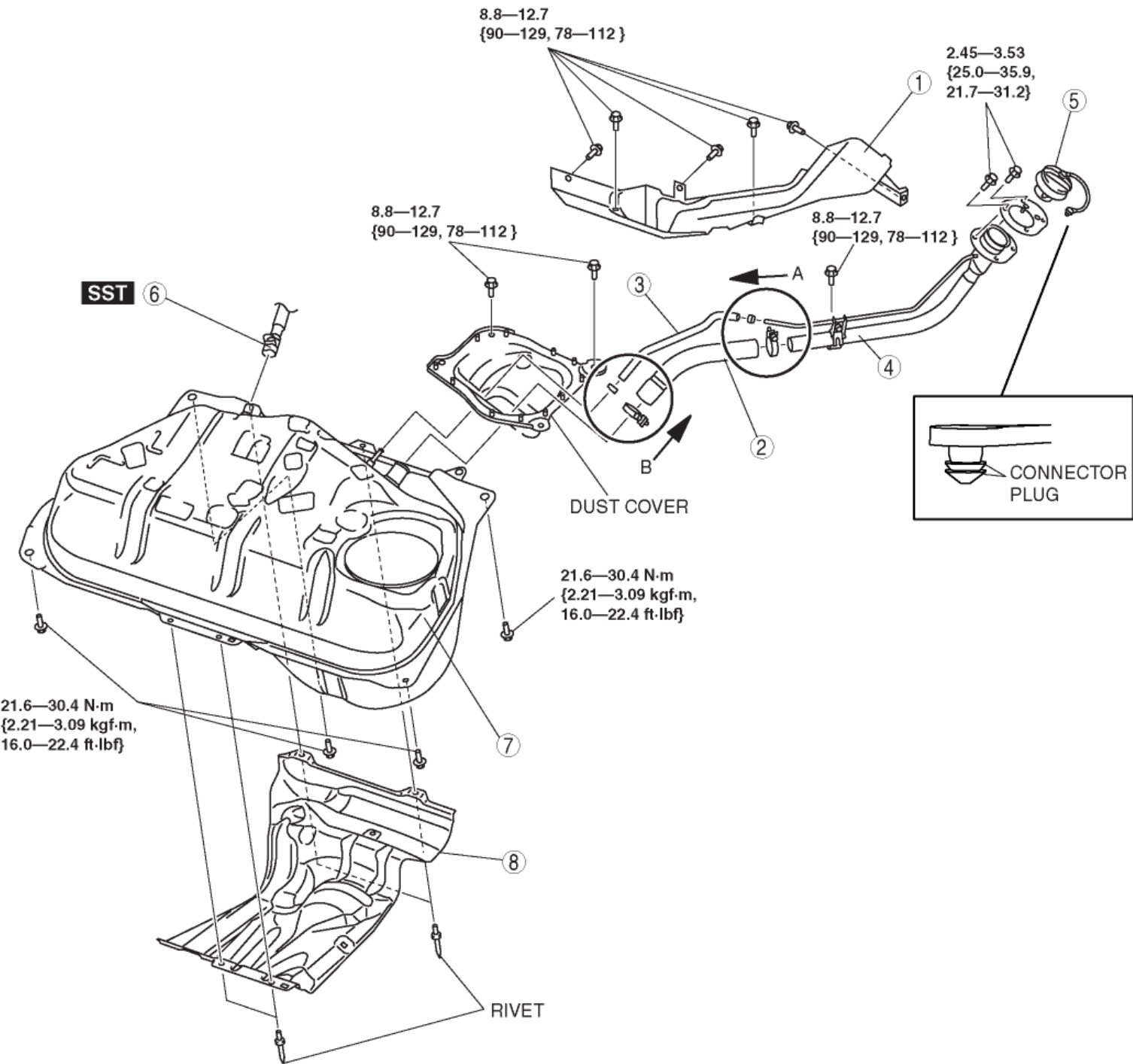
1. Park the vehicle on a level surface.
2. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See [BEFORE SERVICE PRECAUTION \[LF\]](#).)
3. Remove the battery cover.
4. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
5. Remove the following parts.
  - a. Middle pipe (See [EXHAUST SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
  - b. Propeller shaft (See [PROPELLER SHAFT REMOVAL/INSTALLATION](#).)
  - c. Power plant frame (See [TRANSMISSION REMOVAL/INSTALLATION \[M15M-DJ\]](#).) (See [TRANSMISSION REMOVAL/INSTALLATION \[P66M-DJ\]](#).) (See [AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION \[SJ6A-EL\]](#).)
  - d. Rear drive shaft (See [REAR DRIVE SHAFT REMOVAL/INSTALLATION](#).)
  - e. Rear differential (See [REAR DIFFERENTIAL REMOVAL/INSTALLATION](#).)
  - f. Rear crossmember component (See [REAR CROSSMEMBER REMOVAL/INSTALLATION](#).)
6. Perform the following procedure to remove the service hole cover.
  - a. To remove the back trim, remove the following parts:
    - i. Console (See [CONSOLE REMOVAL/INSTALLATION](#).)
    - ii. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION](#).)
    - iii. Scuff plate (See [SCUFF PLATE REMOVAL/INSTALLATION](#).)
    - iv. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION](#).)
    - v. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION](#).)
    - vi. Front seat bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION](#).)
  - b. Remove the back trim. (See [BACK TRIM REMOVAL/INSTALLATION](#).)
  - c. Remove the service hole cover.



7. Disconnect the quick release connector using the **SST** from the fuel pump unit. (See [QUICK RELEASE CONNECTOR](#)

REMOVAL/INSTALLATION [LF].)

- 8. Remove the fuel pump unit. (See FUEL PUMP UNIT REMOVAL/INSTALLATION [LF].)
- 9. Siphon the fuel from the fuel tank.
- 10. Remove in the order indicated in the table.
- 11. Install in the reverse order of removal.
- 12. Complete the "AFTER SERVICE PRECAUTION". (See AFTER SERVICE PRECAUTION [LF].)



N·m { kgf·cm, in·lbf }

1 Protector
(See FUEL TANK REMOVAL/INSTALLATION [LF].)



2	Joint hose (See <a href="#">FUEL TANK REMOVAL/INSTALLATION [LF].</a> )
3	Breather hose (See <a href="#">FUEL TANK REMOVAL/INSTALLATION [LF].</a> )
4	Fuel-filler pipe
5	Fuel-filler cap
6	Quick release connector (Type C) (See <a href="#">QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/INSTALLATION [LF].</a> )
7	Fuel tank (See <a href="#">FUEL TANK REMOVAL/INSTALLATION [LF].</a> )
8	Insulator (See <a href="#">FUEL TANK REMOVAL/INSTALLATION [LF].</a> )

### Protector Removal Note

1. Remove the trunk side trim. (See [TRUNK SIDE TRIM REMOVAL/INSTALLATION](#))

### Fuel Tank Removal Note

1. Move the dust cover slightly out of the way.
2. Move the charcoal canister slightly out of the way. (See [CHARCOAL CANISTER REMOVAL/INSTALLATION \[LF\].](#))

### Insulator Removal Note

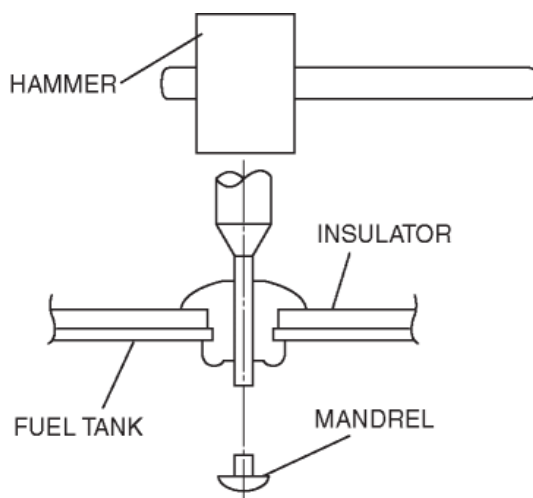
#### CAUTION:

- Be careful not to damage the fuel tank when removing the rivet. If the fuel tank is damaged, it may cause fuel leakage.

#### NOTE:

- The insulator is installed using rivets.
- When reinstalling the rivet, install the same rivet or M5 bolt and nut.

1. Push out the mandrel using a hammer and punch (2—2.8 mm {0.08—0.11 in} diameter).



2. Remove the flange using a drill (5 mm {0.20 in} drill bit).



## 2008 - MX-5 - Engine

### AFTER SERVICE PRECAUTION [LF]

#### WARNING:

- Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Leakage Inspection".

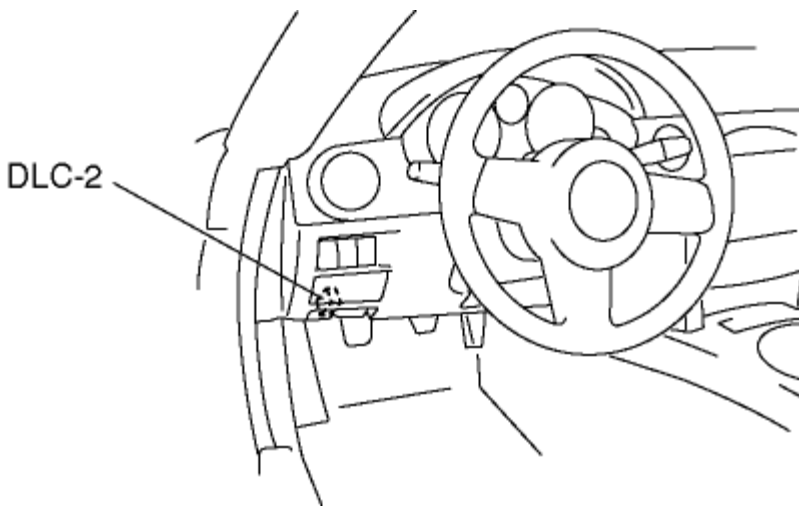
### Fuel Leakage Inspection

#### WARNING:

- Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, complete the following inspection with the engine stopped.

#### Using M-MDS

1. Connect the M-MDS to the DLC-2.



2. Start the fuel pump using the "FP" simulation function.
3. Verify that there is no fuel leakage from the pressurized parts.
  - If there is leakage, replace the fuel hoses and clips.
  - If there is damage on the seal on the fuel pipe side, replace the fuel pipe.

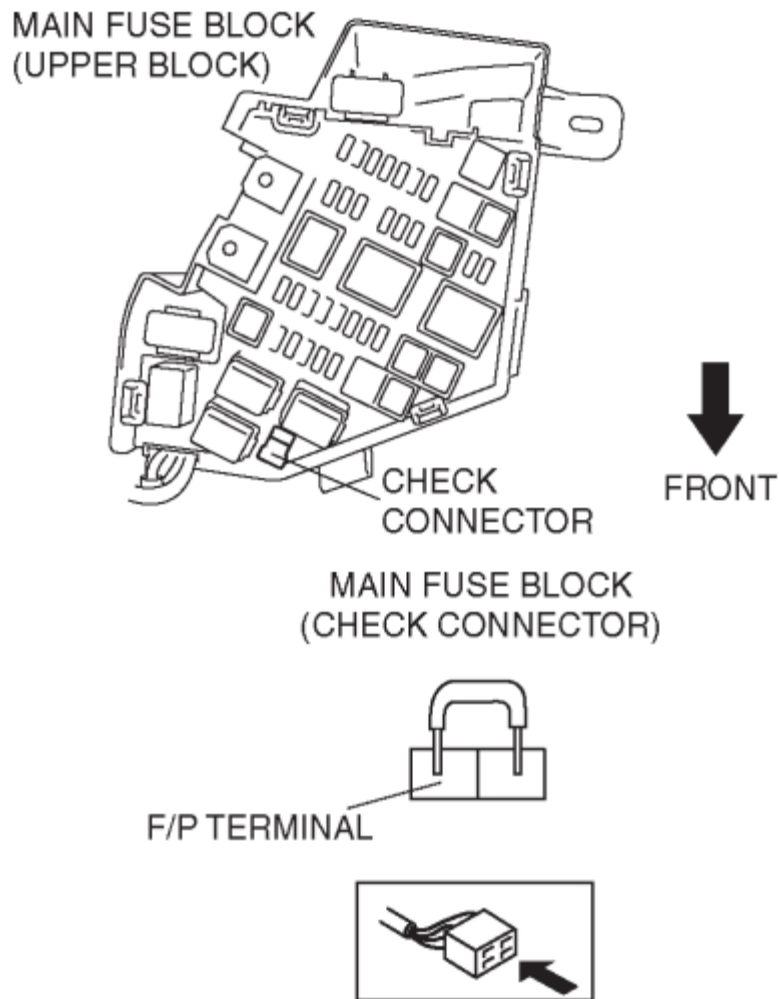
#### Standard

- There shall be no leakage after 5 min.

4. After reinstallation, repeat step 2—3 in the fuel leakage inspection.

**Not using SST (M-MDS)**

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Short the check connector terminal F/P to ground using a jumper wire.



4. Connect the negative battery cable.
5. Turn the ignition switch to the ON position to operate the fuel pump.
6. Verify that there is no fuel leakage from the pressurized parts.
  - If there is leakage, replace the fuel hoses and clips.
  - If there is damage on the seal on the fuel pipe side, replace the fuel pipe.

**Standard**

- There shall be no leakage after 5 min.
7. After reinstallation, repeat step 5—6 in the fuel leakage inspection.



## 2008 - MX-5 - Engine

### BEFORE SERVICE PRECAUTION [LF]

#### WARNING:

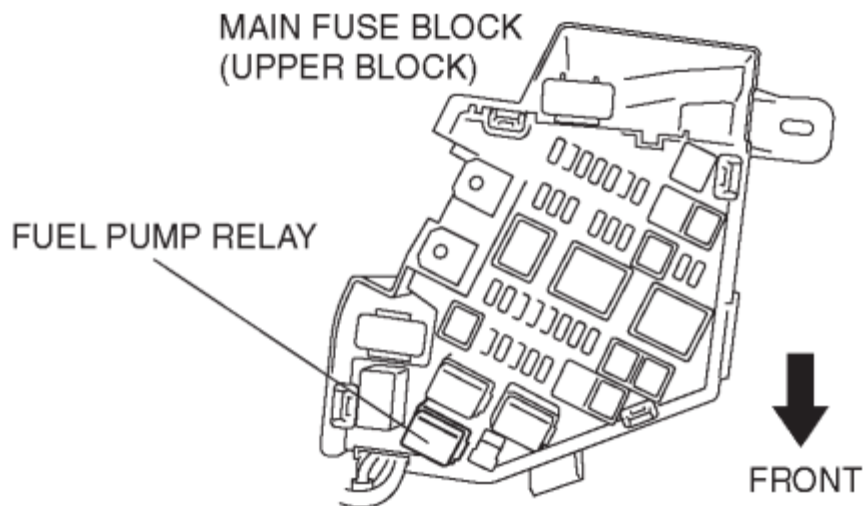
- Fuel vapor is hazardous. It can very easily ignite, causing serious injury and damage. Always keep sparks and flames away from fuel.
- Fuel line spills and leakage from the pressurized fuel system are dangerous. Fuel can ignite and cause serious injury or death and damage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure".
- A person charged with static electricity could cause a fire or explosion, resulting in death or serious injury. Before performing work on the fuel system, discharge static electricity by touching the vehicle body.

#### CAUTION:

- If there is foreign material on the connecting area of the quick release connector, it might damage the connector or fuel pipe. To prevent this, disconnect the connector and clean the connecting area before connecting.

### Fuel Line Safety Procedure

1. Remove the fuel-filler cap to release the pressure inside the fuel tank.
2. Remove the fuel pump relay.



3. Start the engine.
4. After the engine stalls, crank the engine **several times**.
5. Turn the ignition switch to the LOCK position.
6. Install the fuel pump relay.

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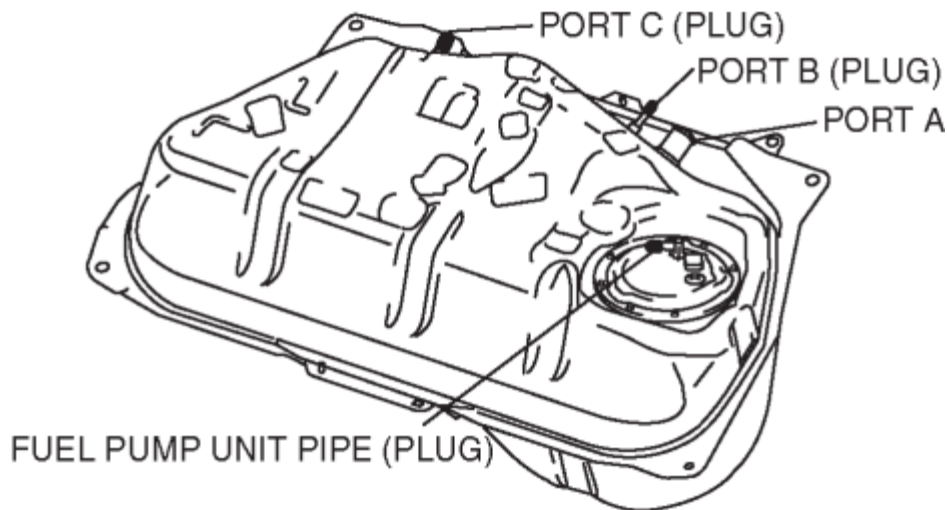
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## 2008 - MX-5 - Engine

### FUEL TANK INSPECTION [LF]

#### NOTE:

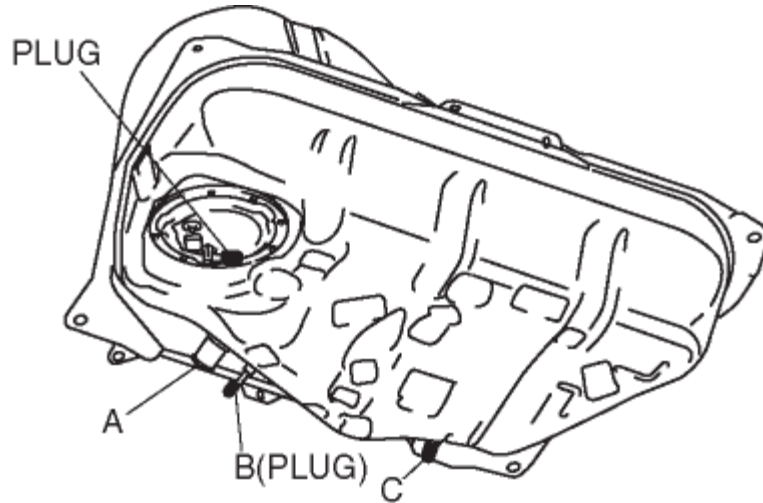
- The two rollover valves built into the fuel tank and check valves (two-way) built into the rollover valves are inspected in this inspection.
1. Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See [BEFORE SERVICE PRECAUTION \[LF\]](#).)
  2. Remove the battery cover.
  3. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
  4. Remove the fuel tank with the fuel pump unit. (See [FUEL TANK REMOVAL/INSTALLATION \[LF\]](#).)
  5. Perform the following procedure to verify the fuel tank airtightness.
    - a. Plug the fuel pump unit pipe, port B and port C.



- b. Apply a pressure of **3 kPa {23 mmHg, 0.9 inHg}** to port A and wait for a while.
  - c. Verify that there is no air leakage from the fuel tank.
    - If there is airflow, replace the fuel tank.
6. Plug the fuel pump unit pipe and port B.
7. Level the fuel tank.
8. Apply a pressure of **3 kPa {23 mmHg, 0.9 inHg}** to port C and wait for a while.
9. With the pressure still applied, verify that there is airflow from port A and the pressure is **0—3 kPa {0—22 mmHg, 0—0.8 inHg}**.
  - If there is no airflow, replace the fuel tank.



10. Apply a pressure of **-0.5 kPa {-3.8 mmHg, -0.1 inHg}** to port C and wait for a while.
11. With the pressure still applied, verify that there is airflow from port A and the pressure is **-0.5— 0 kPa {-3.8— 0 mmHg, -0.2— 0 inHg}**.
- If there is no airflow, replace the fuel tank.
  - If there is airflow, place the fuel tank upside down.
12. Apply a pressure of **3 kPa {23 mmHg, 0.9 inHg}** to port C and wait for a while.



13. With the pressure still applied, verify that there is no airflow from port A.
- If there is airflow, replace the fuel tank.

## 2008 - MX-5 - Engine

### NONRETURN VALVE INSPECTION [LF]

#### WARNING:

- Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure", while referring to the "BEFORE SERVICE PRECAUTION".

- Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See [BEFORE SERVICE PRECAUTION \[LF\]](#).)
- Remove the battery cover.
- Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
- Remove the fuel pump unit. (See [FUEL PUMP UNIT REMOVAL/INSTALLATION \[LF\]](#).)
- Siphon the fuel from the fuel tank.

#### NOTE:

- Nonreturn valve is integrated in the fuel tank.
  - The nonreturn valve is normally closed by the spring force.
- Verify that the nonreturn valve is closed.
    - If the nonreturn valve is stuck open and does not open even when pulled up by a finger, replace the fuel tank. (See [FUEL TANK REMOVAL/INSTALLATION \[LF\]](#).)

## 2008 - MX-5 - Engine

### QUICK RELEASE CONNECTOR REMOVAL/INSTALLATION [LF]

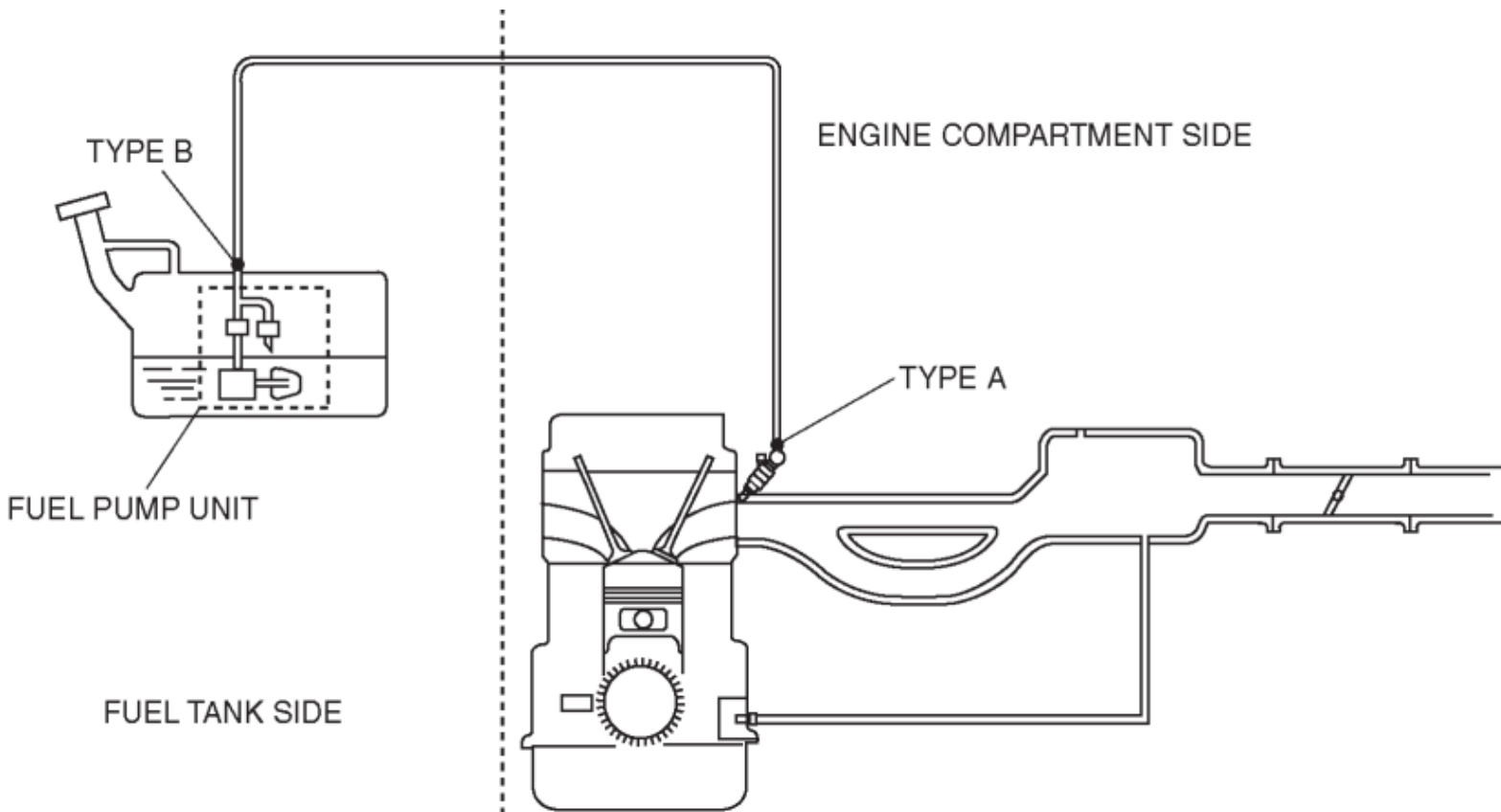
#### WARNING:

- Fuel is very flammable liquid. If fuel spills or leaks from the pressurized fuel system, it will cause serious injury or death and facility breakage. Fuel can also irritate skin and eyes. To prevent this, always complete the "Fuel Line Safety Procedure", while referring to the "BEFORE SERVICE PRECAUTION".

#### Quick Release Connector Type

#### CAUTION:

- There are two types of quick release connectors. Verify the type and location, and install/remove properly.



#### Type A Removal

- Follow "BEFORE SERVICE PRECAUTION" before performing any work operations to prevent fuel from spilling from the fuel system. (See [BEFORE SERVICE PRECAUTION \[LF\]](#).)

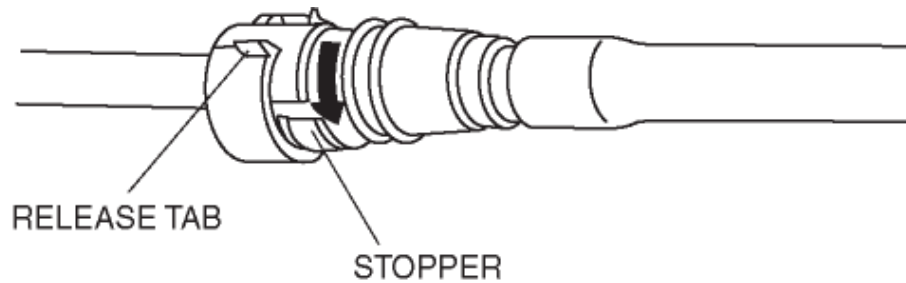
#### CAUTION:

- The quick release connector may be damaged if the release tab is bent excessively. Do not expand the release tab over the stopper.

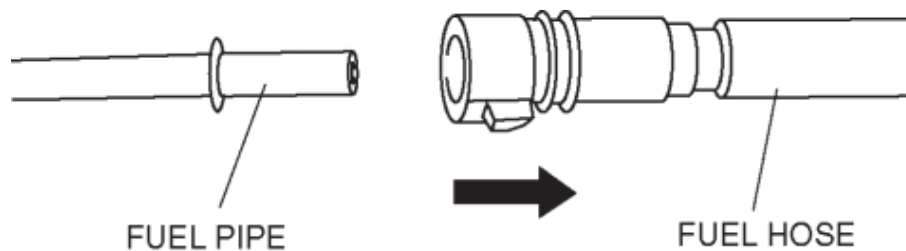
**NOTE:**

- The fuel hose can be removed by pushing it to the pipe side to release the lock.

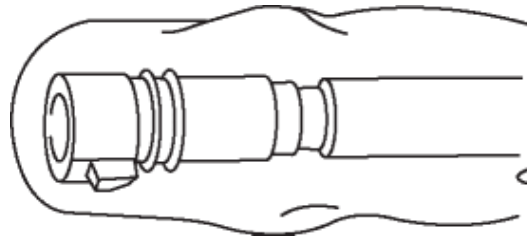
2. Rotate the release tab on the quick release connector to the stopper position.



3. Pull out the fuel hose straight from the fuel pipe and disconnect it.



4. Cover the disconnected quick release connector and fuel pipe with vinyl sheeting or a similar material to prevent it from becoming scratched or dirty.



## Type B Removal

**CAUTION:**

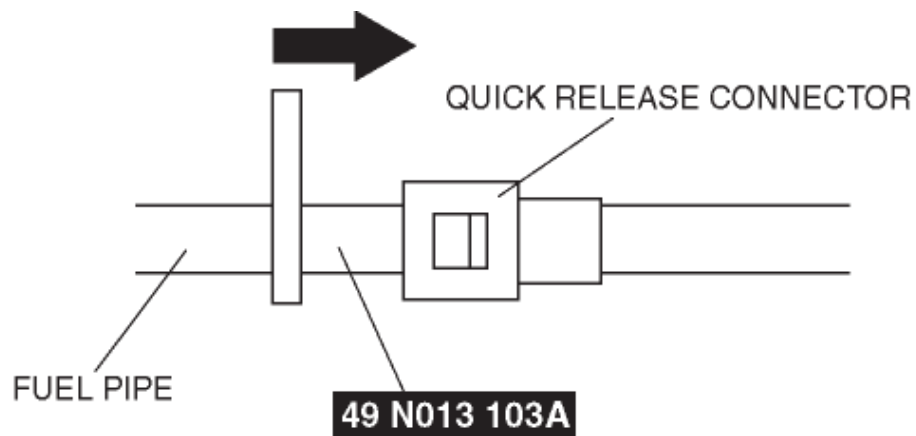
- Be careful not to damage the pipe when unlocking the retainer.

**NOTE:**

- When removing the quick connector, either **SST 49 E042 001** or **49 N013 103A** (Part of **49 N013 1A0D**) can be used.

**When using SST 49 N013 103A (Part of 49 N013 1A0D)**

1. Follow "BEFORE SERVICE PRECAUTION" and remove dirt from the connecting surfaces before performing any work operations. (See **BEFORE SERVICE PRECAUTION [LF]**.)
2. Insert the **SST** into the quick release connector.

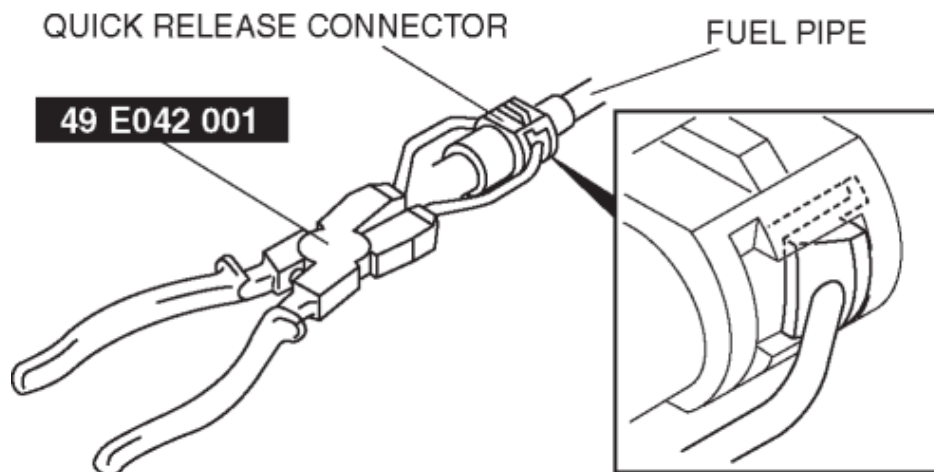


3. Pull out the fuel hose straight from the fuel pipe and disconnect it.
4. Cover the disconnected quick release connector and fuel pipe with vinyl sheeting or a similar material to prevent it from scratches or dirt.

**When using SST 49 E042 001**

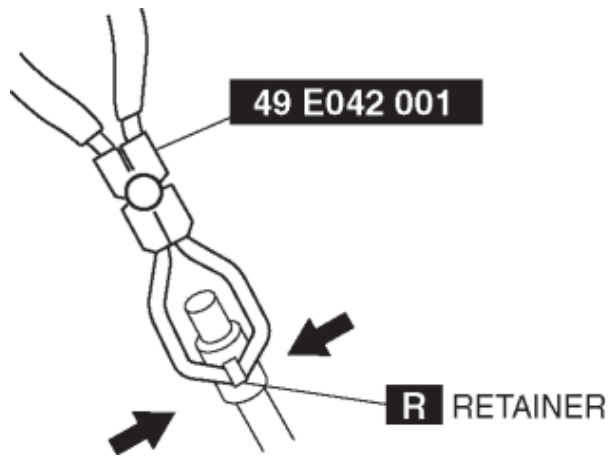
**NOTE:**

- If the quick release connector is removed, replace the retainer with a new one.
1. Follow "BEFORE SERVICE PRECAUTION" and remove dirt from the connecting surfaces before performing any work operations. (See [BEFORE SERVICE PRECAUTION \[LF\].](#))
  2. Set the **SST** parallel to the quick release connector.



**NOTE:**

- The quick release connector can be removed by pushing the center of the retainer tabs.
  - The retainer is attached to the pipe even after the connector is disconnected.
3. Hold the center of the retainer tabs with the **SST** ends and press the retainer.
  4. Pull the connector side and disconnect the quick release connector.
  5. Raise a retainer tab using the **SST** and remove the retainer.

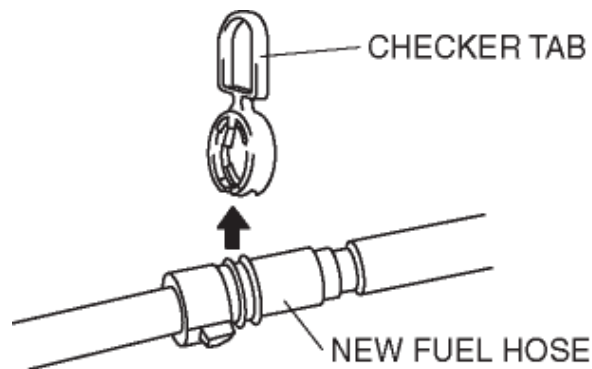


6. Cover the disconnected quick release connector and fuel pipe with vinyl sheeting or a similar material to prevent it from scratches or dirt.

## Type A Installation

### NOTE:

- If the quick release connector O-ring is damaged or has slipped, replace the fuel hose.
- A checker tab is integrated with the quick release connector for new fuel hoses and evaporative hoses. Remove the checker tab from the quick release connector after the connector is completely engaged with the fuel pipe.



1. Inspect the fuel hose and fuel pipe sealing surface for damage and deformation.

- If there is any malfunction, replace it with a new one.

2. Apply a small amount of clean engine oil to the sealing surface of the fuel pipe.

3. Reconnect the fuel hose straight to the fuel pipe until a click is heard.

### NOTE:

- If the quick release connector does not move at all, disconnect it, verify that the O-ring is not damaged or has not slipped, and then reconnect the quick release connector.

4. Lightly pull and push the quick release connector a few times by hand, and then verify that it can move **2.0—3.0 mm {0.08—0.12 in}** and is connected securely.

5. Complete the "AFTER SERVICE PRECAUTION". (See **AFTER SERVICE PRECAUTION [LF]**.)

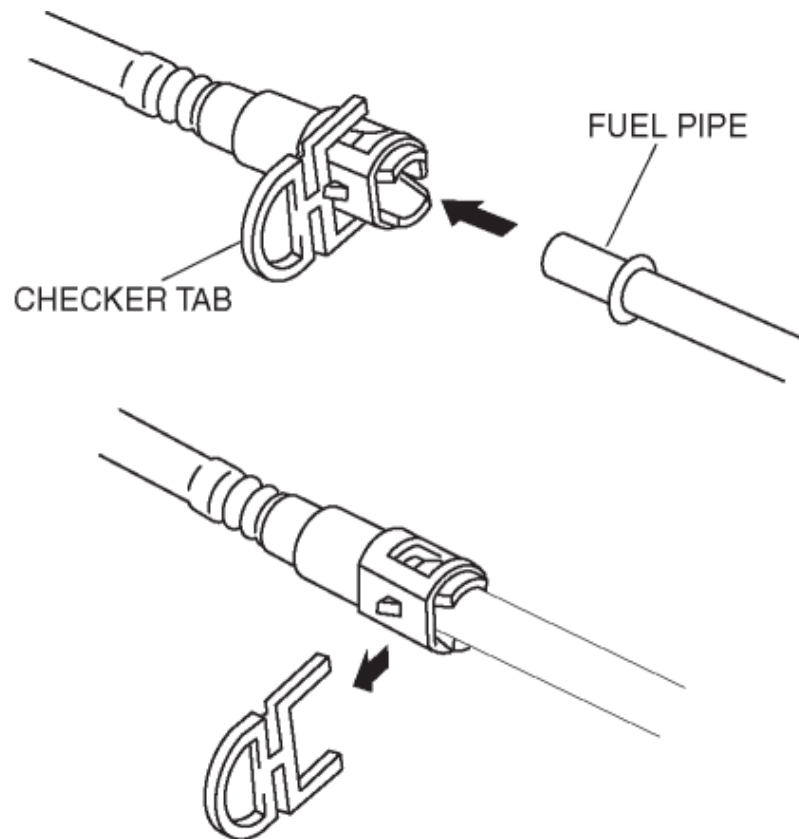
## Type B Installation

### CAUTION:

- Always replace the retainer with a new one when using SST 49 E042 001, otherwise, fuel leakage could result.

### NOTE:

- If the quick release connector O-ring is damaged or has slipped, replace the piping component.
- A checker tab is integrated with the quick release connector for new fuel hoses and evaporative hoses. Remove the checker tab from the quick release connector after the connector is completely engaged with the fuel pipe.



1. Inspect the fuel hose and fuel pipe sealing surface for damage and deformation.
  - If there is any malfunction, replace it with a new one.
2. Apply a small amount of clean engine oil to the sealing surface of the fuel pipe.
3. Install a new retainer to the quick release connector.
4. Reconnect the hose straight to the pipe until a click is heard.
5. Lightly pull and push the quick release connector a few times by hand, and then verify that it is connected securely.
6. Complete the "AFTER SERVICE PRECAUTION". (See [AFTER SERVICE PRECAUTION \[LF\]](#).)

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## 2008 - MX-5 - Engine

### EXHAUST SYSTEM INSPECTION [LF]

1. Start the engine and inspect each exhaust system component for exhaust gas leakage.
  - If there is leakage, repair or replace the appropriate component.

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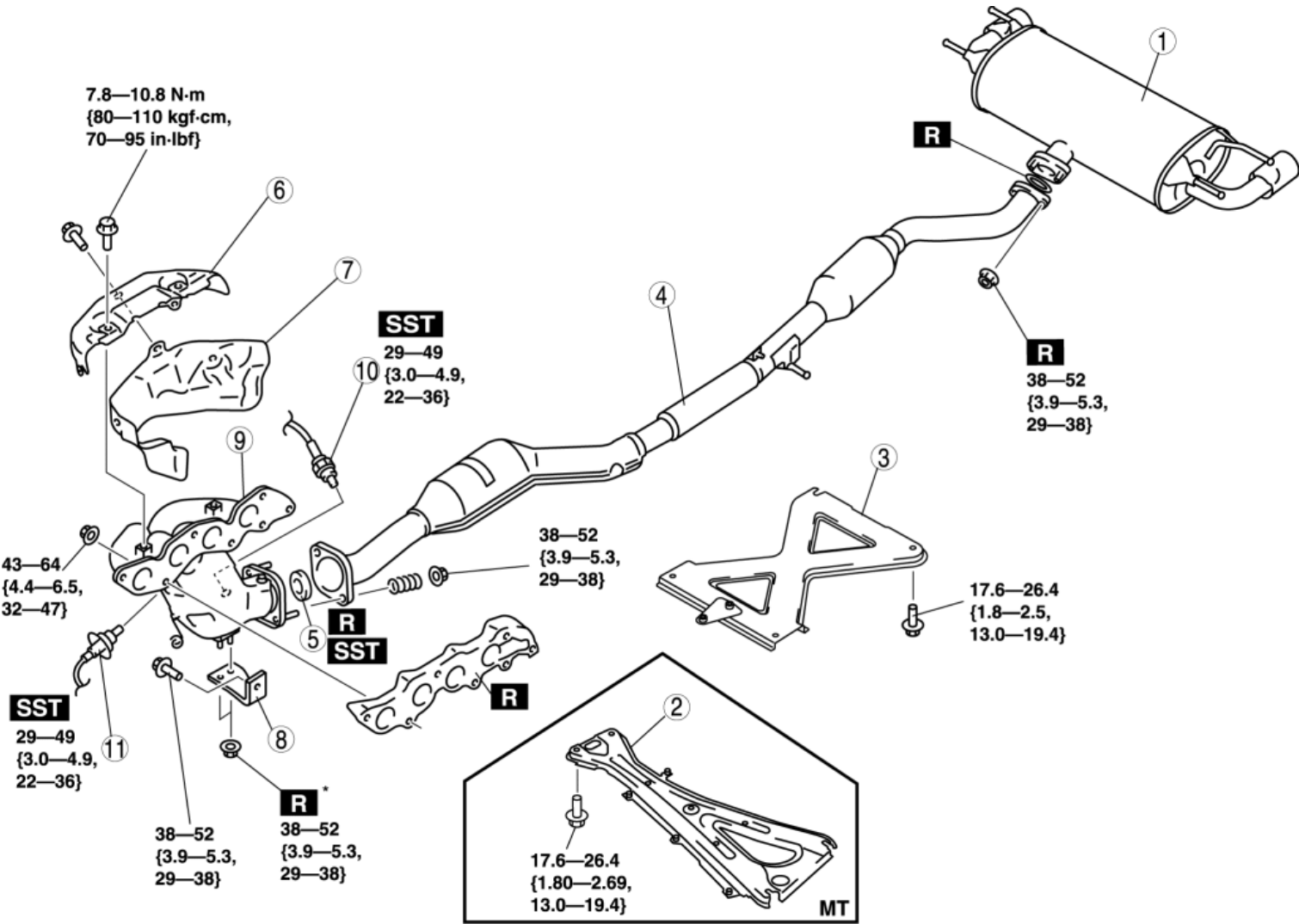


2008 - MX-5 - Engine

EXHAUST SYSTEM REMOVAL/INSTALLATION [LF]

WARNING:

- A hot engine and exhaust system can cause severe burns. Turn off the engine and wait until they are cool before servicing the exhaust system.
1. Remove the battery cover.
  2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
  3. Remove in the order indicated in the table.
  4. Install in the reverse order of removal.



\*: VEHICLE WITH SELF LOCKING NUT

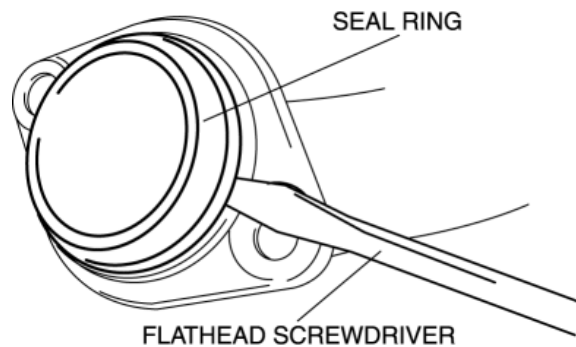
N·m {kgf·m, ft·lbf}

1	Main silencer
2	Member bracket (MT) (See <a href="#">TRANSMISSION REMOVAL/INSTALLATION [M15M-D]</a> .)
3	Tunnel member

4	Middle pipe
5	Seal ring (See <a href="#">Seal Ring Removal Note.</a> ) (See <a href="#">Seal Ring Installation Note.</a> )
6	Exhaust manifold insulator (upper) (See <a href="#">EXHAUST SYSTEM REMOVAL/INSTALLATION [LF].</a> )
7	Exhaust manifold insulator (lower)
8	Exhaust manifold bracket
9	Exhaust manifold (See <a href="#">EXHAUST SYSTEM REMOVAL/INSTALLATION [LF].</a> )
10	Rear HO2S (See <a href="#">REAR HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF].</a> )
11	Front HO2S (See <a href="#">FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF].</a> )

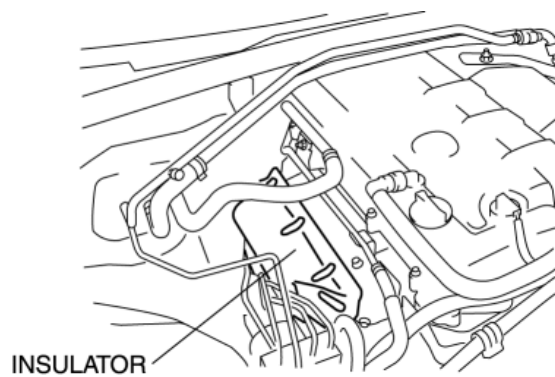
#### Seal Ring Removal Note

1. Remove the seal ring using a flathead screwdriver being careful not to damage the pipe.



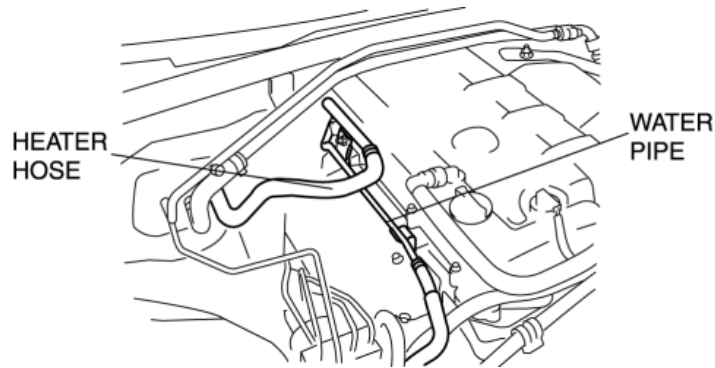
#### Exhaust Manifold Insulator (Upper) Removal Note

1. Remove the battery and battery tray. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
2. Remove the drive belt. (See [DRIVE BELT REPLACEMENT \[LF\].](#))
3. Remove the under cover. (See [TRANSVERSE MEMBER REMOVAL/INSTALLATION.](#))
4. Remove the suspension tower bar (joint) and (right side). (See [FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION.](#))
5. Remove the generator. (See [GENERATOR REMOVAL/INSTALLATION \[LF\].](#))
6. Remove the insulator.



### Exhaust Manifold Removal Note

1. Disconnect the front HO2S connector and rear HO2S connector.
2. Move the water pipe and heater hose slightly out of the way.



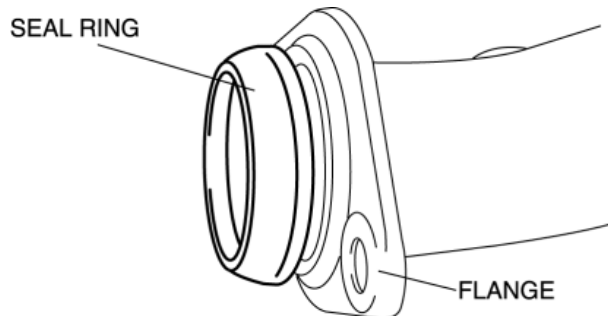
3. Disconnect the ventilation hose from the cylinder head. (See [QUICK RELEASE CONNECTOR \(EMISSION SYSTEM\) REMOVAL/INSTALLATION \[LF.\]](#).)

### Seal Ring Installation Note

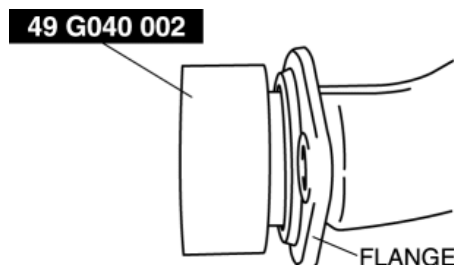
#### CAUTION:

- If installation is performed without using the SST, the seal ring will be damaged and deformed, resulting in an incorrect installation. Always use the SST to install the seal ring.

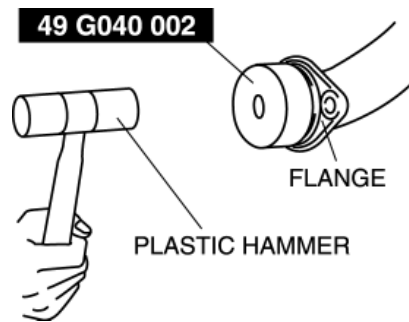
1. Temporarily install the seal ring to the pipe so that the seal ring is even with the flange.



2. Install the SST to the seal ring so that the SST is even with the flange.



3. Press in the seal ring by tapping the SST using a plastic hammer until the seal ring contacts the flange.



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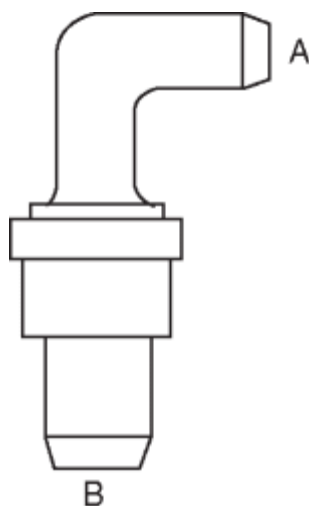
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## 2008 - MX-5 - Engine

### POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION [LF]

1. Remove the intake manifold. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
2. Remove the PCV valve.
3. Verify that there is no airflow when pressure is applied to port A.

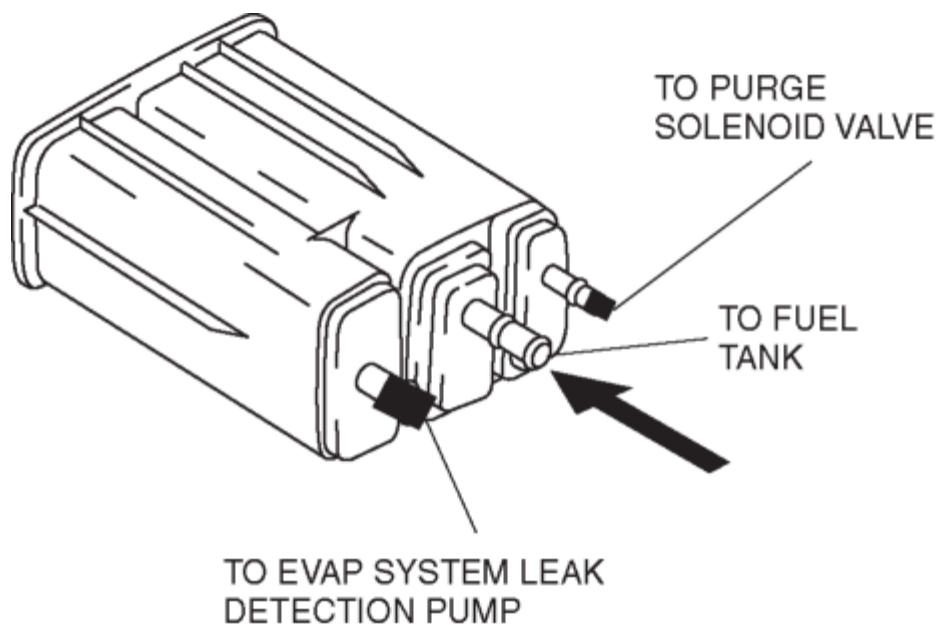


- If there is airflow, replace the PCV valve.
4. Verify that there is airflow when vacuum is applied to port A.
- If there is no airflow, replace the PCV valve.

## 2008 - MX-5 - Engine

### CHARCOAL CANISTER INSPECTION [LF]

1. Remove the charcoal canister. (See [CHARCOAL CANISTER REMOVAL/INSTALLATION \[LF\]](#).)
2. Plug the EVAP leak detection pump side and purge solenoid valve side of the charcoal canister.

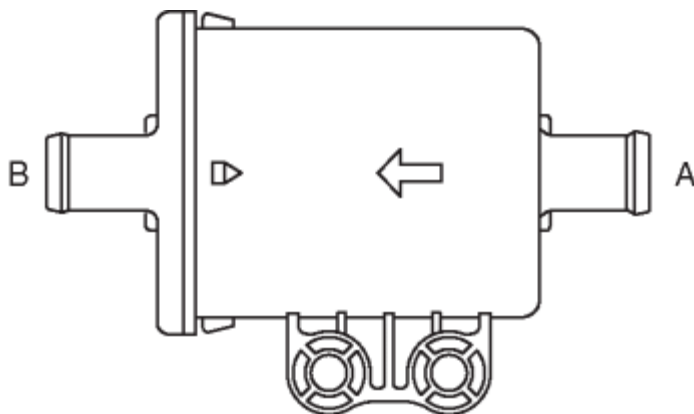


3. Inspect for air leakage when blowing air by mouth from the fuel tank side.
  - If air leaks, replace the charcoal canister. (See [CHARCOAL CANISTER REMOVAL/INSTALLATION \[LF\]](#).)

## 2008 - MX-5 - Engine

### AIR FILTER INSPECTION [LF]

1. Remove the air filter. (See [AIR FILTER REMOVAL/INSTALLATION \[LF\]](#).)
2. Blow from port A and verify that there is airflow from port B.

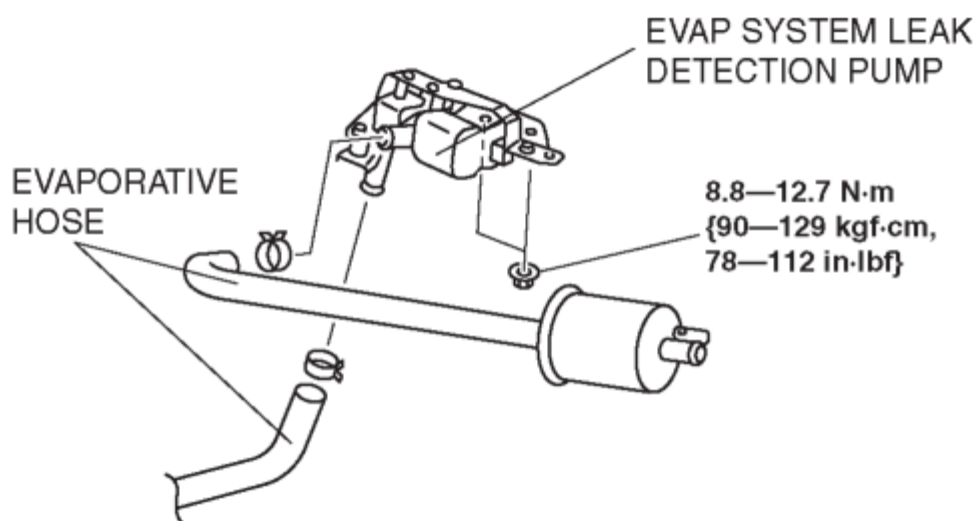


- If not as specified, replace the air filter.
3. Blow from port B and verify that there is airflow from port A.
- If not as specified, replace the air filter. (See [AIR FILTER REMOVAL/INSTALLATION \[LF\]](#).)

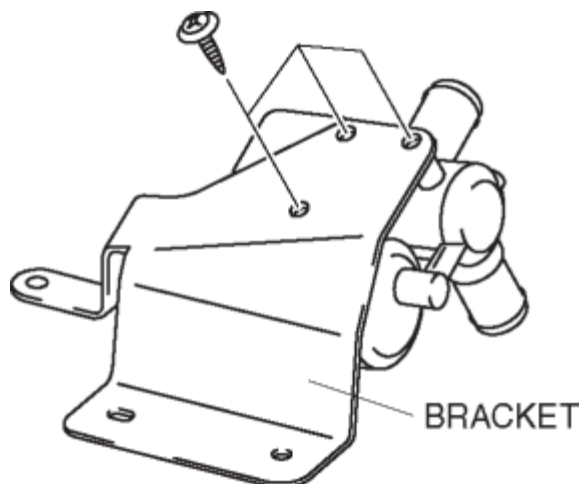
## 2008 - MX-5 - Engine

### EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP REMOVAL/INSTALLATION [LF]

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Disconnect the EVAP system leak detection pump connector.
4. Disconnect the evaporative hose from the EVAP system leak detection pump.



5. Cover the evaporative hose with vinyl sheets or the like to prevent them from being scratched or contaminated with foreign material.
6. Remove the EVAP system leak detection pump with the bracket.
7. Remove the bracket from the EVAP system leak detection pump.

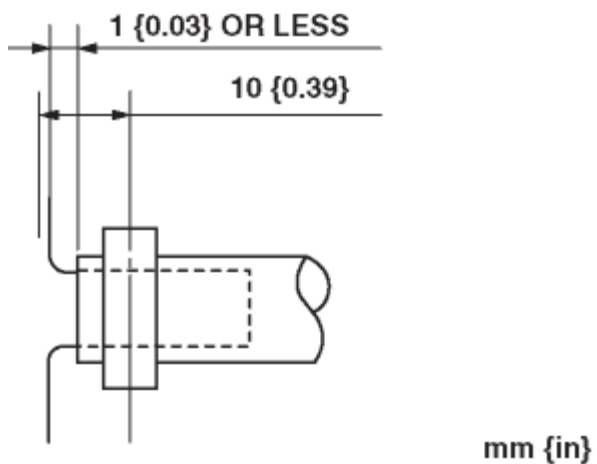


8. Install in the reverse order of removal.



## Evaporative Hose Installation Note

1. Fit the evaporative hose onto the respective fittings, and install clamps as shown.



- a. Insert the evaporative hose securely to the nipple.
- b. Inspect the evaporative hose for damage and deformation.

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## 2008 - MX-5 - Engine

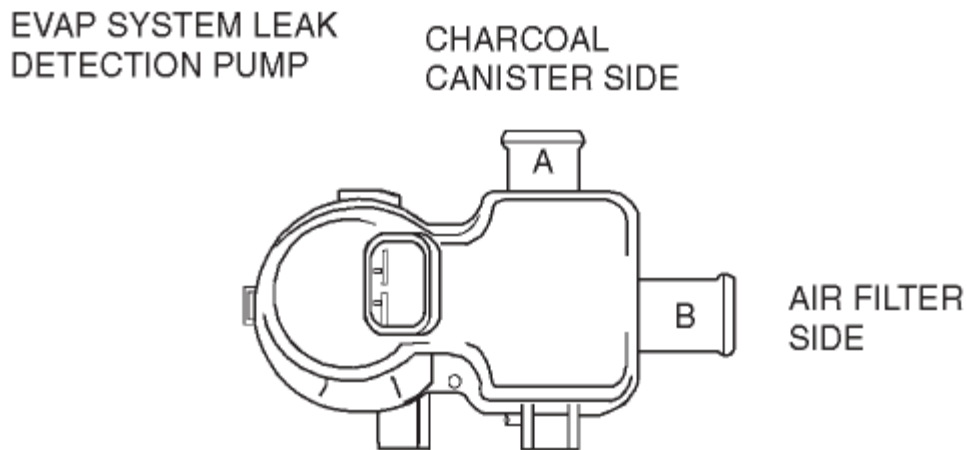
### EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP INSPECTION [LF]

#### NOTE:

- Perform the following procedure only when directed.

#### Airflow Inspection

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the EVAP system leak detection pump. (See [EVAPORATIVE EMISSION \(EVAP\) SYSTEM LEAK DETECTION PUMP REMOVAL/INSTALLATION \[LF\]](#).)
4. Blow air into port A and verify that there is airflow from port B.
  - If not as specified, replace the EVAP system leak detection pump. (See [EVAPORATIVE EMISSION \(EVAP\) SYSTEM LEAK DETECTION PUMP REMOVAL/INSTALLATION \[LF\]](#).)



5. Blow air into port B and verify that there is airflow from port A.
  - If not as specified, replace the EVAP system leak detection pump. (See [EVAPORATIVE EMISSION \(EVAP\) SYSTEM LEAK DETECTION PUMP REMOVAL/INSTALLATION \[LF\]](#).)
  - If as specified, perform the following "Resistance Inspection".

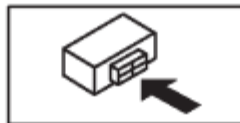
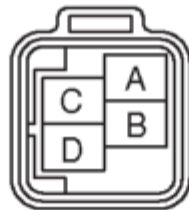
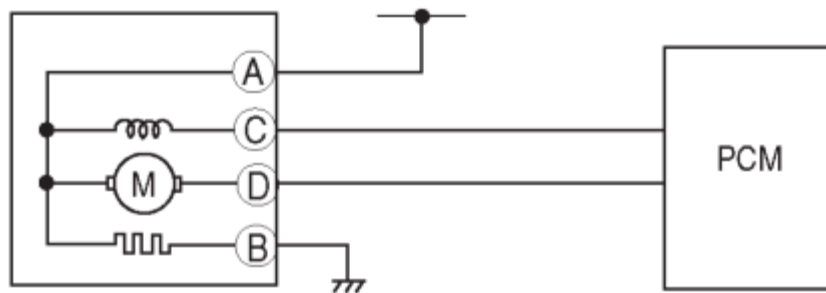
#### Resistance Inspection

1. Inspect resistance of the EVAP system leak detection pump.

- If not as specified, replace the EVAP system leak detection pump. (See **EVAPORATIVE EMISSION (EVAP) SYSTEM LEAK DETECTION PUMP REMOVAL/INSTALLATION [LF]**.)
- If as specified, carry out the "Circuit Open/Short Inspection".

Terminals	Resistance (ohm)
A—B	20—50
A—C	26.6—32.4
A—D	MAX. 118

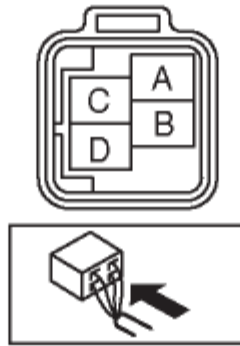
EVAP SYSTEM  
LEAK DETECTION PUMP



### Circuit Open/Short Inspection

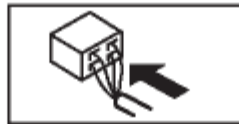
1. Disconnect the PCM connector. (See **PCM REMOVAL/INSTALLATION [LF]**.)
2. Inspect the following wiring harness for open or short circuit (continuity check).

## EVAP SYSTEM LEAK DETECTION PUMP WIRING HARNESS-SIDE CONNECTOR



## PCM WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



### Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - EVAP system leak detection pump terminal C and PCM terminal 1V
  - EVAP system leak detection pump terminal D and PCM terminal 1U
  - EVAP system leak detection pump terminal A and main relay
  - EVAP system leak detection pump terminal B and body ground

### Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - EVAP system leak detection pump terminal C and body ground
  - EVAP system leak detection pump terminal D and body ground
  - EVAP system leak detection pump terminal C and power supply
  - EVAP system leak detection pump terminal D and power supply
  - EVAP system leak detection pump terminal A and body ground

- EVAP system leak detection pump terminal B and power supply

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## 2008 - MX-5 - Engine

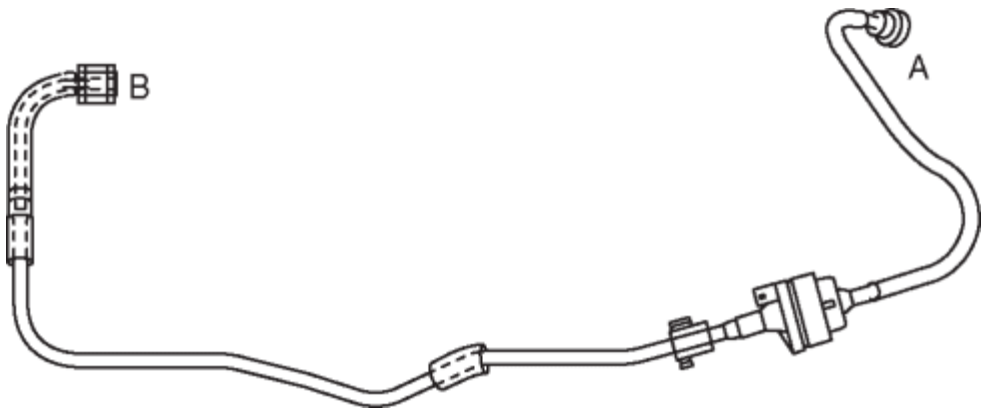
### PURGE SOLENOID VALVE INSPECTION [LF]

**NOTE:**

- Perform the following procedure only when directed.

#### Airflow Inspection

1. Remove the purge solenoid valve without disconnecting the evaporative hose. (See [PURGE SOLENOID VALVE REMOVAL/INSTALLATION \[LF\]](#).)
2. Verify that the airflow is as indicated in the table.



- If as specified in the table, perform the "Circuit Open/Short Inspection".
- If not as specified in the table, inspect the purge solenoid valve. (See [PURGE SOLENOID VALVE REMOVAL/INSTALLATION \[LF\]](#).)

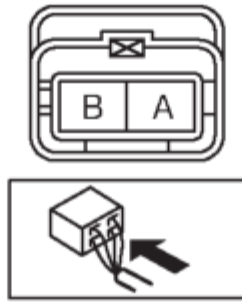
Measured condition	Continuity between A—B
When voltage is not applied between terminals A and B	No airflow
When voltage is applied between terminals A and B	Airflow detected

#### Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See [PCM REMOVAL/INSTALLATION \[LF\]](#).)

2. Inspect the following wiring harnesses for open or short circuit (continuity check).

### PURGE SOLENOID VALVE WIRING HARNESS-SIDE CONNECTOR



### PCM WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



#### Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - Purge solenoid valve terminal A and PCM terminal 2C
  - Purge solenoid valve terminal B and main relay

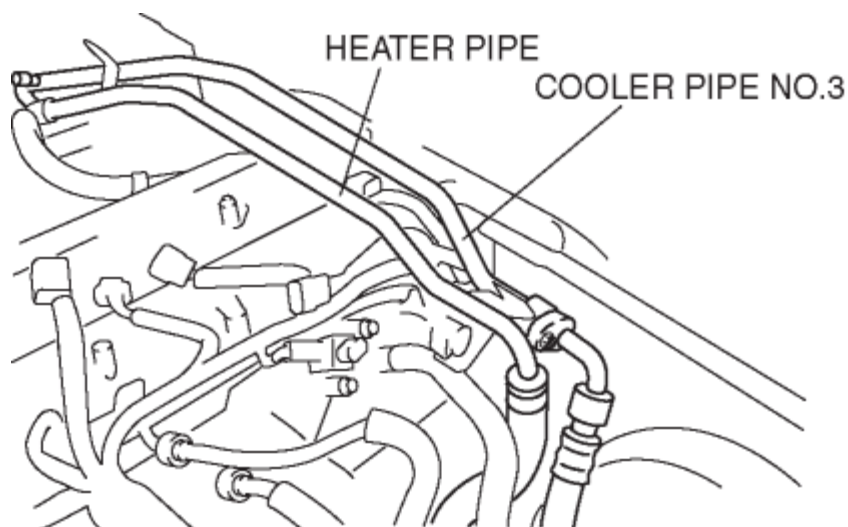
#### Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - Purge solenoid valve terminal A and power supply
  - Purge solenoid valve terminal A and body ground
  - Purge solenoid valve terminal B and body ground

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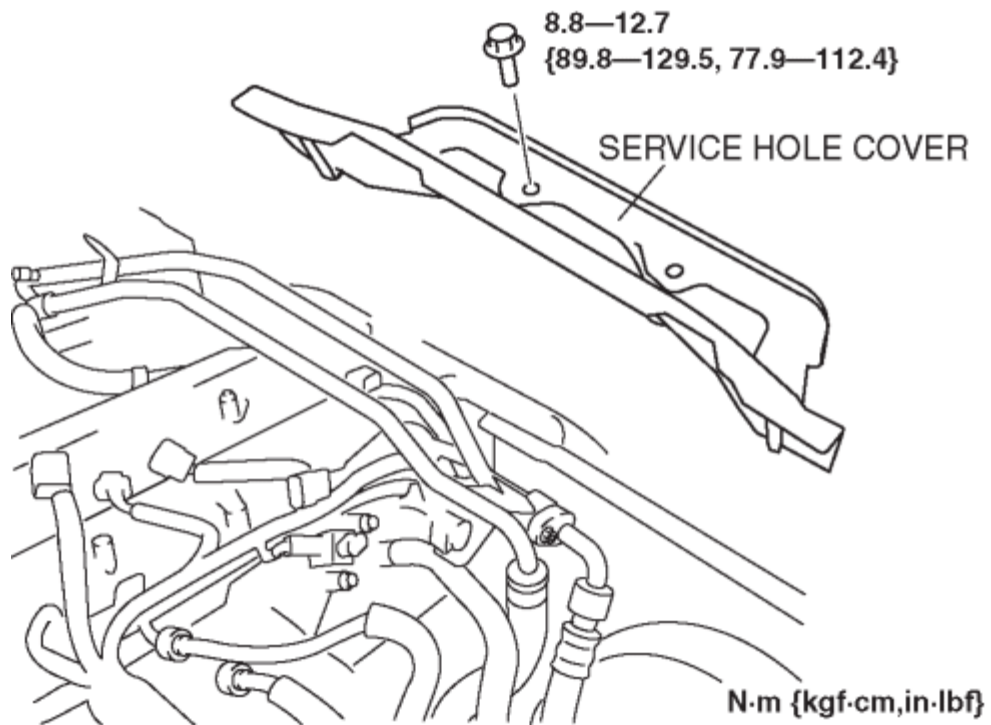
### EGR VALVE REMOVAL/INSTALLATION [LF]

1. Remove the plug hole plate. (See [PLUG HOLE PLATE REMOVAL/INSTALLATION \[LF\]](#).)
2. Remove the battery cover.
3. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
4. Drain the engine coolant from the radiator. (See [ENGINE COOLANT REPLACEMENT \[LF\]](#).)
5. Remove the service hole cover.
  - a. Remove the suspension tower bar (joint), (right side) and (left side). (See [FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION](#).)
  - b. Remove the wiper arm. (See [WIPER ARM AND BLADE REMOVAL/INSTALLATION](#).)
  - c. Remove the cowl grille. (See [COWL GRILLE REMOVAL/INSTALLATION](#).)
  - d. Remove the side cowl grille. (See [SIDE COWL GRILLE REMOVAL/INSTALLATION](#).)
  - e. Move the cooler pipe No.3 and heater pipe slightly out of the way.

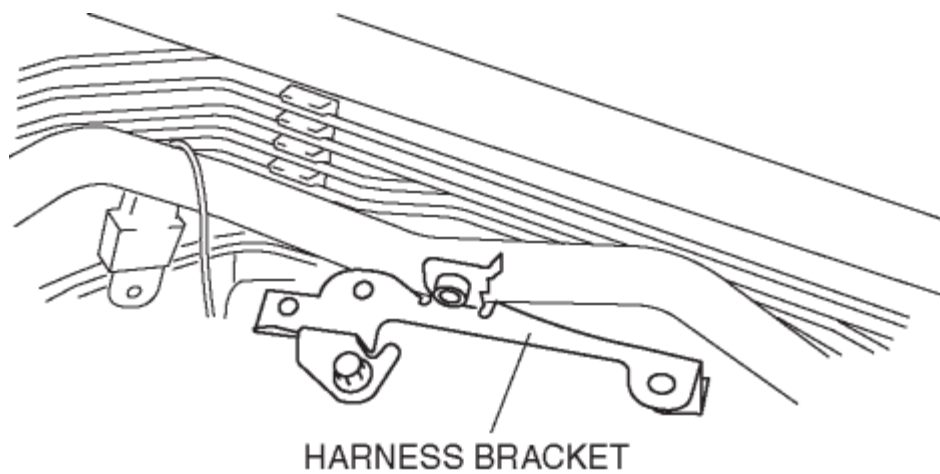


- f. Remove the service hole cover.

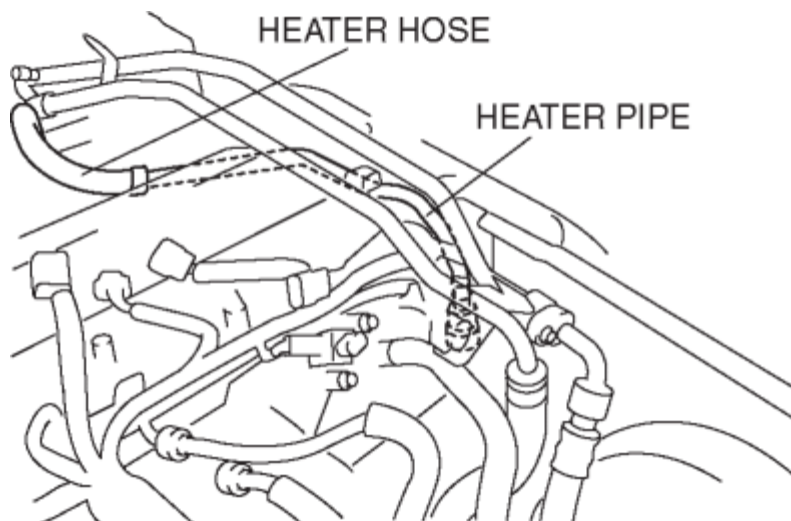




6. Remove the harness bracket.

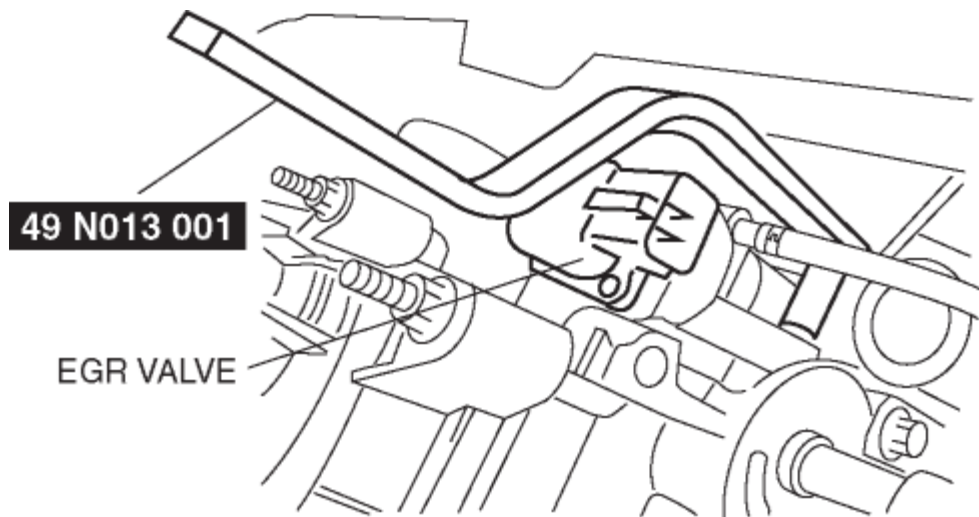


7. Disconnect the heater hose and move the heater pipe slightly out of the way.

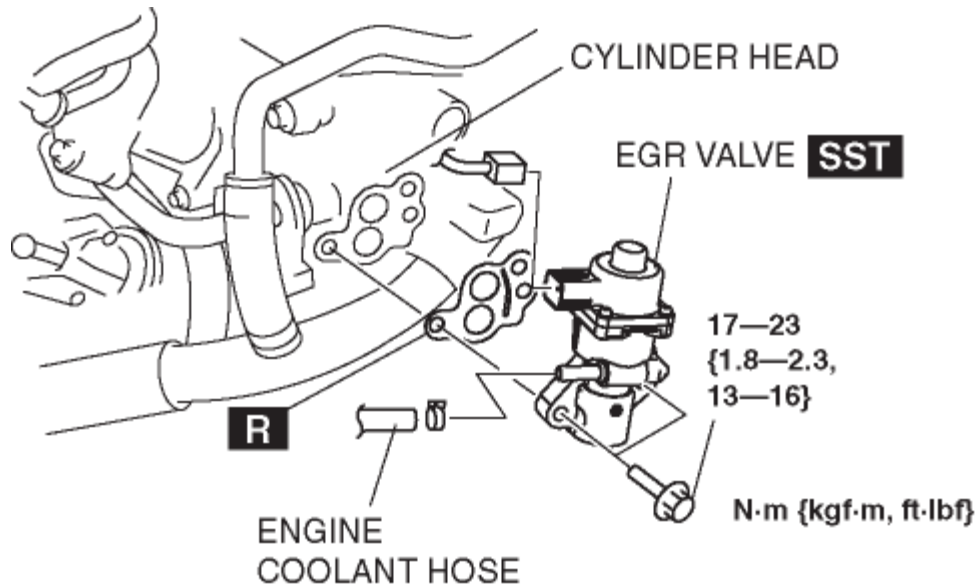


8. Disconnect the EGR valve connector.

9. Set the **SST** to the EGR valve installation bolt.



10. Remove both EGR valve installation bolts.



11. Remove the EGR valve with the engine coolant hose.

12. Disconnect the engine coolant hose from the EGR valve.

13. Replace the EGR valve gasket.

14. Install in the reverse order of removal.

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### EGR VALVE INSPECTION [LF]

#### NOTE:

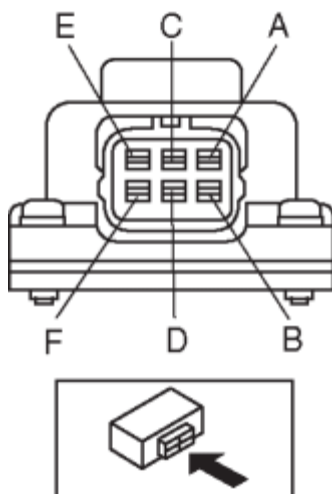
- Perform the following procedure only when directed.

#### On-vehicle Inspection

1. Verify that the buzzing sound (valve operation sound) is heard from the EGR valve when engine cranking.
  - If the buzzing sound is not heard, perform the resistance inspection.

#### Resistance Inspection

1. Remove the plug hole plate. (See [PLUG HOLE PLATE REMOVAL/INSTALLATION \[LF\]](#).)
2. Disconnect the battery cover.
3. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
4. Disconnect the EGR valve connector. (See [EGR VALVE REMOVAL/INSTALLATION \[LF\]](#).)
5. Measure the resistance between the EGR valve terminals.



- If within the specification, perform out the "Circuit Open/Short Inspection".
- If not within the specification, replace the EGR valve. (See [EGR VALVE REMOVAL/INSTALLATION \[LF\]](#).)

#### Standard

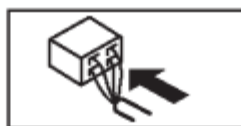
\_\_\_\_\_

Terminal	Resistance (ohm)
C—E	12—16
C—A	
D—B	
D—F	

## Circuit Open/Short Inspection

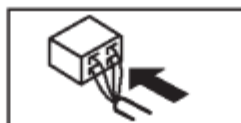
1. Disconnect the PCM connector. (See [PCM REMOVAL/INSTALLATION \[LF\]](#).)
2. Inspect the following wiring harnesses for open or short circuit (continuity check).

### EGR VALVE WIRING HARNESS-SIDE CONNECTOR



### PCM WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



### Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - EGR valve terminal A and PCM terminal 2G

EGR valve terminal B and PCM terminal 2L

- EGR valve terminal E and PCM terminal 2K
- EGR valve terminal F and PCM terminal 2H
- EGR valve terminal C and main relay
- EGR valve terminal D and main relay

### **Short circuit**

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - EGR valve terminal A and body ground
  - EGR valve terminal A and power supply
  - EGR valve terminal B and body ground
  - EGR valve terminal B and power supply
  - EGR valve terminal C and body ground
  - EGR valve terminal D and body ground
  - EGR valve terminal E and body ground
  - EGR valve terminal E and power supply
  - EGR valve terminal F and body ground
  - EGR valve terminal F and power supply

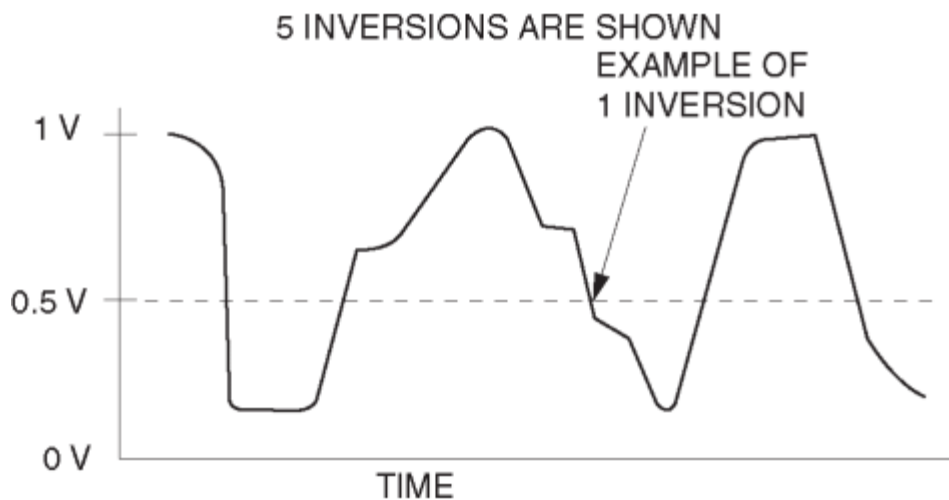
## 2008 - MX-5 - Engine

### WARM-UP THREE-WAY CATALYTIC CONVERTER (WU-TWC) INSPECTION [LF]

#### NOTE:

- Make sure that no HO2S DTCs have been detected. If detected, this inspection is not applicable for WU-TWC inspection.

1. Connect the M-MDS and monitor PIDs as following.
  - Monitor the WU-TWC using O2S11 PID for upstream HO2S and O2S12 PID for downstream HO2S.
2. Monitor the appropriate PIDs.
3. Drive the vehicle for **10 min** at **65—96 km/h {40—60 mph}** to allow the front catalytic converter to reach operating temperature.
4. Stop the vehicle and leave it in a safe place.
5. Idle the engine.
6. Record PIDs for **1 min**.



7. Select the appropriate PIDs and read the graph.
8. Count the number of times (inversions) that the upstream HO2S graph line actually crosses the **0.5 V** line.
9. Count the number of times (inversions) that the downstream HO2S graph line actually crosses the **0.5 V** line.

#### NOTE:

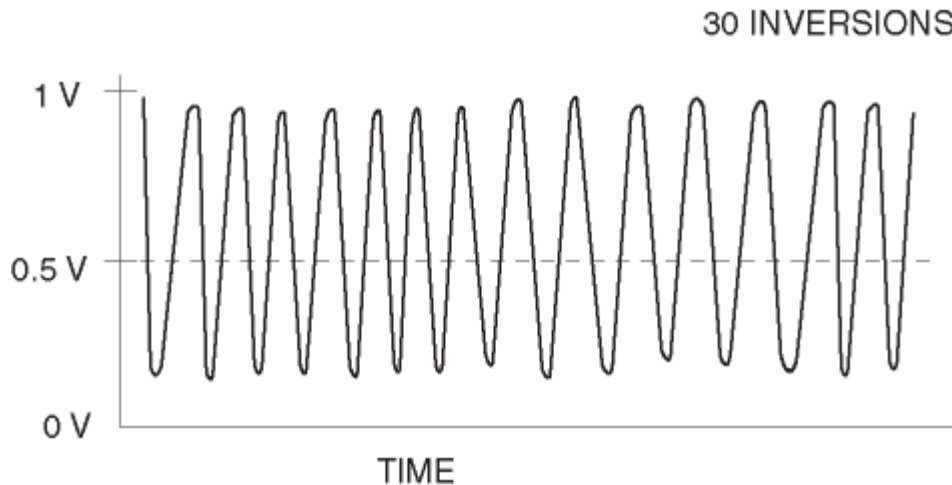
- Do not count the number of peaks. Refer to the graph.

10. Using the following equation, calculate the value of ratio.

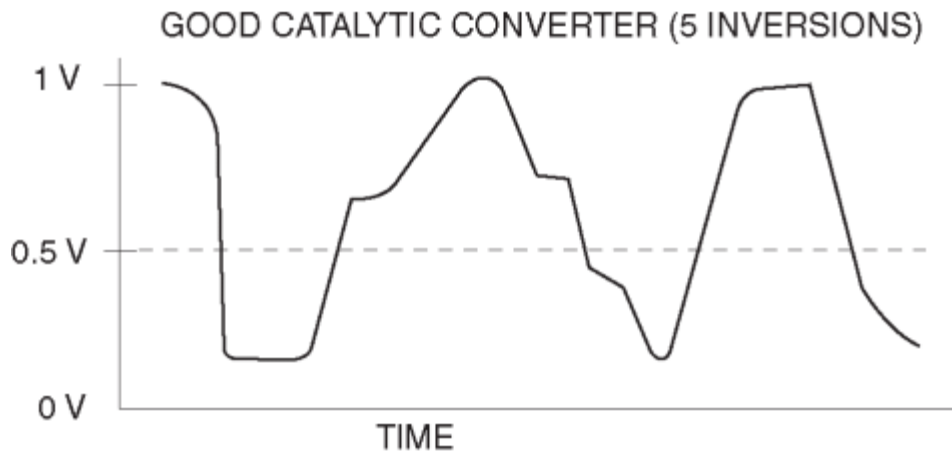
### Equation

- $\text{RATIO} = \text{Upstream HO}_2\text{S inversion} \div \text{downstream HO}_2\text{S inversion}$
- If the ratio is **1.5 or more** or there is no downstream HO<sub>2</sub>S inversion, the WU-TWC is functioning properly.
- If the ratio is **less than 1.5**, the WU-TWC is not functioning properly. Replace the WU-TWC.

Upstream HO<sub>2</sub>S graph line example



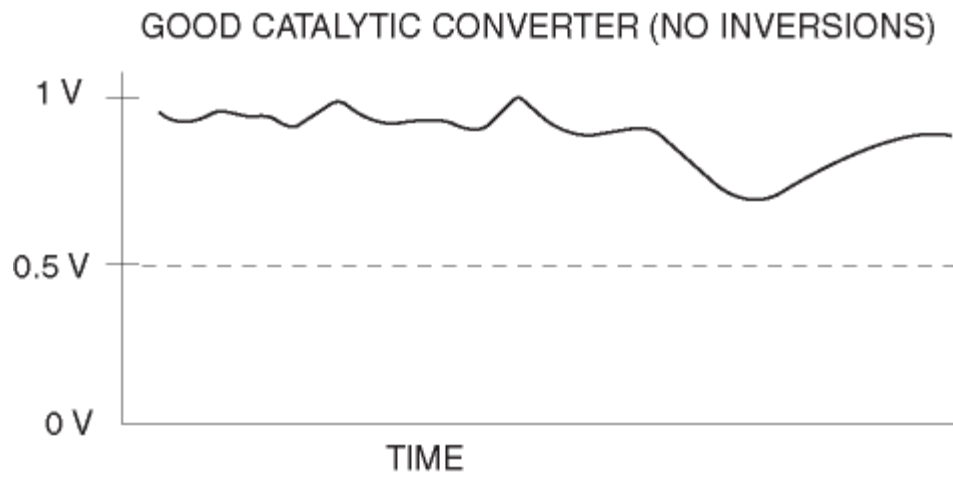
Downstream HO<sub>2</sub>S graph line example 1



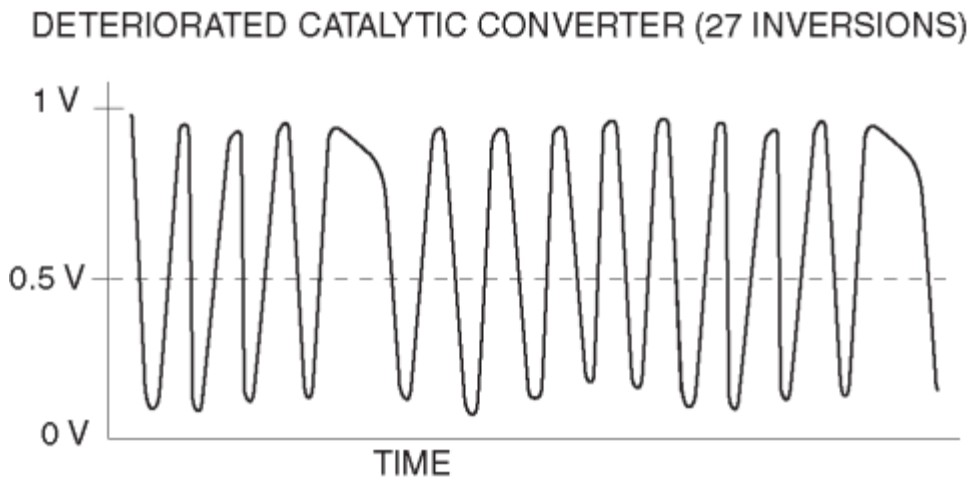
### Equation

- $\text{RATIO} = 30 \text{ inversions (upstream HO}_2\text{S inversions)} \div 5 \text{ inversions (downstream HO}_2\text{S inversions)} = 6.0 \text{ (good WU TWC)}$

Downstream HO<sub>2</sub>S graph line example 2



Downstream HO2S graph line example 3



**Equation**

- $\text{RATIO} = \frac{30 \text{ inversions (upstream HO2S inversions)}}{27 \text{ inversions (downstream HO2S inversions)}} = 1.1 \text{ (bad WU-TWC)}$

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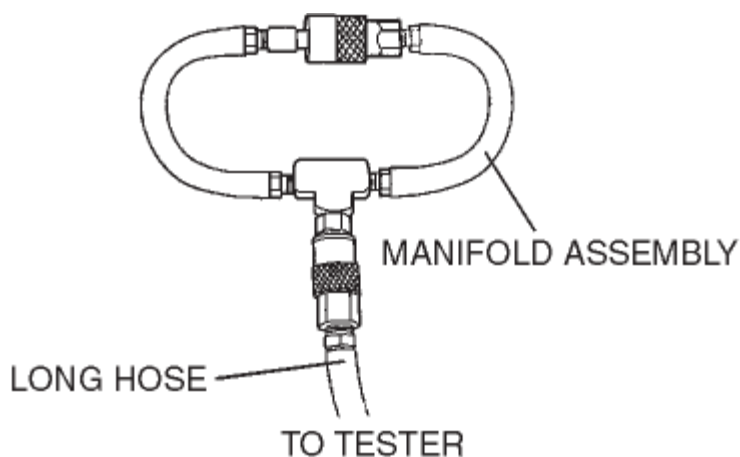
### FUEL-FILLER CAP INSPECTION [LF]

#### Leakage Inspection

1. Perform the following **SST** (Evaporative Emission System Tester 134-01049) self test:

#### NOTE:

- If the tester does not work correctly during self test, refer to the tester operators manual for more detailed procedures.
- a. Verify the gas cylinder valve is closed and the control valve located on the tester is in the TEST position. All tester display should be off at this time.
- b. Connect the long hose (part of **SST**) to the tester.



- c. Connect the manifold assembly (part of **SST**) to the long hose as shown.
- d. Open the gas cylinder valve and verify the gas cylinder regulator left gauge reads **10 to 12 psi** (preset at factory).
  - If not, refer to the tester operators manual to contact tester manufacturer.
- e. Press the ON/OFF switch to turn on the **SST** and make sure the left display reads **0.0**.
- f. Turn the control valve on the tester to the FILL position.
- g. Verify the left display reading is **within 13.9 to 14.0 in of water**.
  - If not, adjust the pressure using the regulator knob located on the right side of the tester.
- h. Turn the control valve to TEST position and press the START switch.

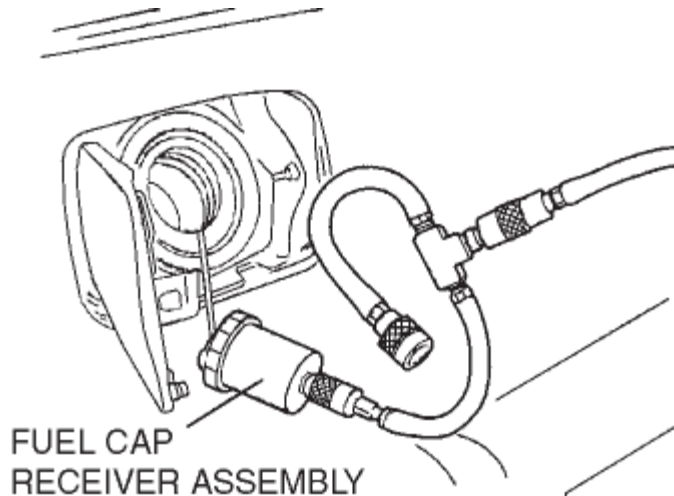
i. After the **2-min** countdown (left display) is completed, the right display shows the total pressure loss for that period. A **0.5 in of water** loss is acceptable on the self test.

- If the loss is **more than 0.5 in of water**, do one or more self test. If the failed test repeats, check for leak using the ultrasonic leak detector (part of **SST**).

2. Press the RESET switch to set the left display reading to **0.0**.

3. Connect the fuel cap receiver assembly (part of **SST**) to the manifold assembly and fuel filler cap from the vehicle.

- If the fuel filler cap is not a genuine part, replace it.



4. Turn the control valve to the FILL position.

5. Wait (**maximum 20 s**) until the left display reads **13.9 to 14 in** of water.

- If the reading is slightly below, adjust it using the regulator knob.
- If the reading is far below, the fuel filler cap has leak. Replace it.

6. Turn the control valve to the TEST position and press the START switch.

7. After the **2 min** countdown (left display) is completed, check the test result (the failed/passed light on the tester).

- If the green light turns on, the fuel filler cap is OK.
- If the red light turns on, the fuel filler cap has leakage. Replace it.

8. Close the gas cylinder valve.

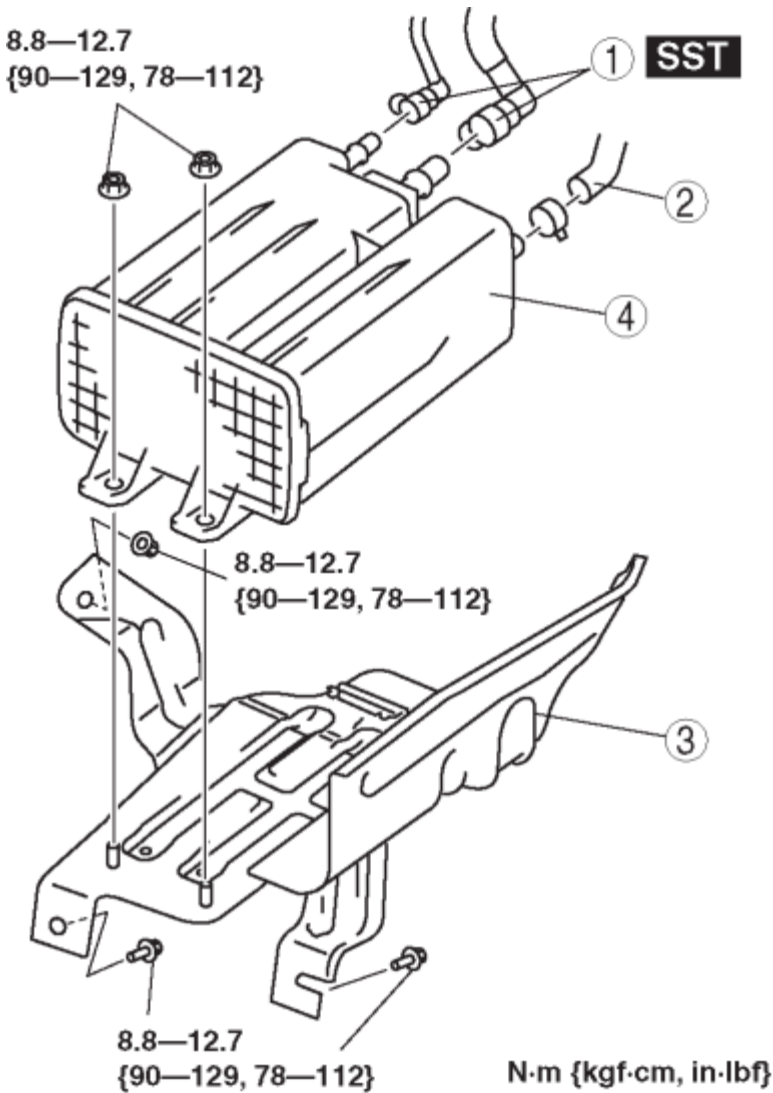
9. Turn the control valve to the FILL position.

10. Press the ON/OFF switch to turn off the tester.

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CHARCOAL CANISTER REMOVAL/INSTALLATION [LF]

- 1. Remove the battery cover.
- 2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
- 3. Remove in the order indicated in the table.
- 4. Install in the reverse order of removal.

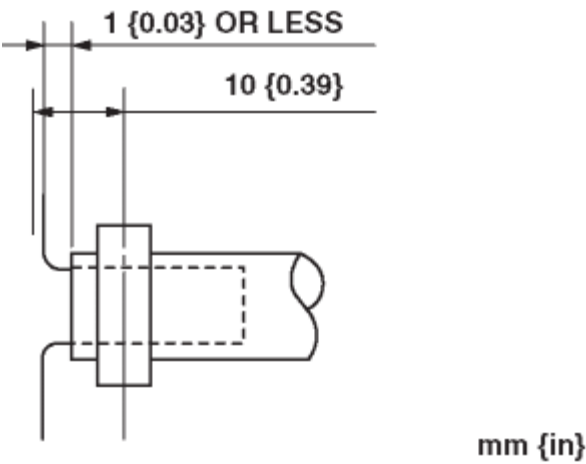


1	Quick connector (Type C)
	(See <a href="#">QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/INSTALLATION [LF].</a> )

2	Evaporative hose (See <a href="#">CHARCOAL CANISTER REMOVAL/INSTALLATION [LF]</a> .)
3	Charcoal canister bracket
4	Charcoal canister

Evaporative Hose Installation Note

1. Fit the evaporative hose onto the respective fittings, and install clamps as shown.

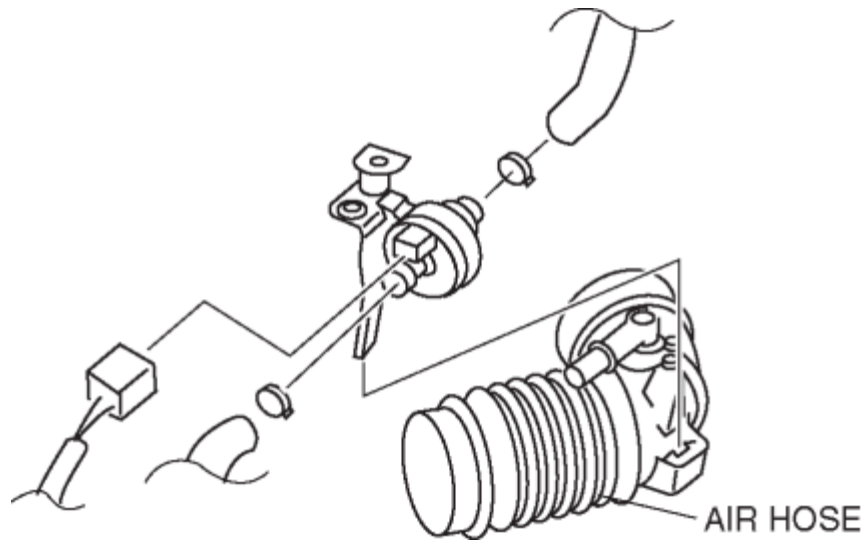


- a. Insert the evaporative hose securely to the nipple.
- b. Inspect the evaporative hose for damage and deformation.

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### PURGE SOLENOID VALVE REMOVAL/INSTALLATION [LF]

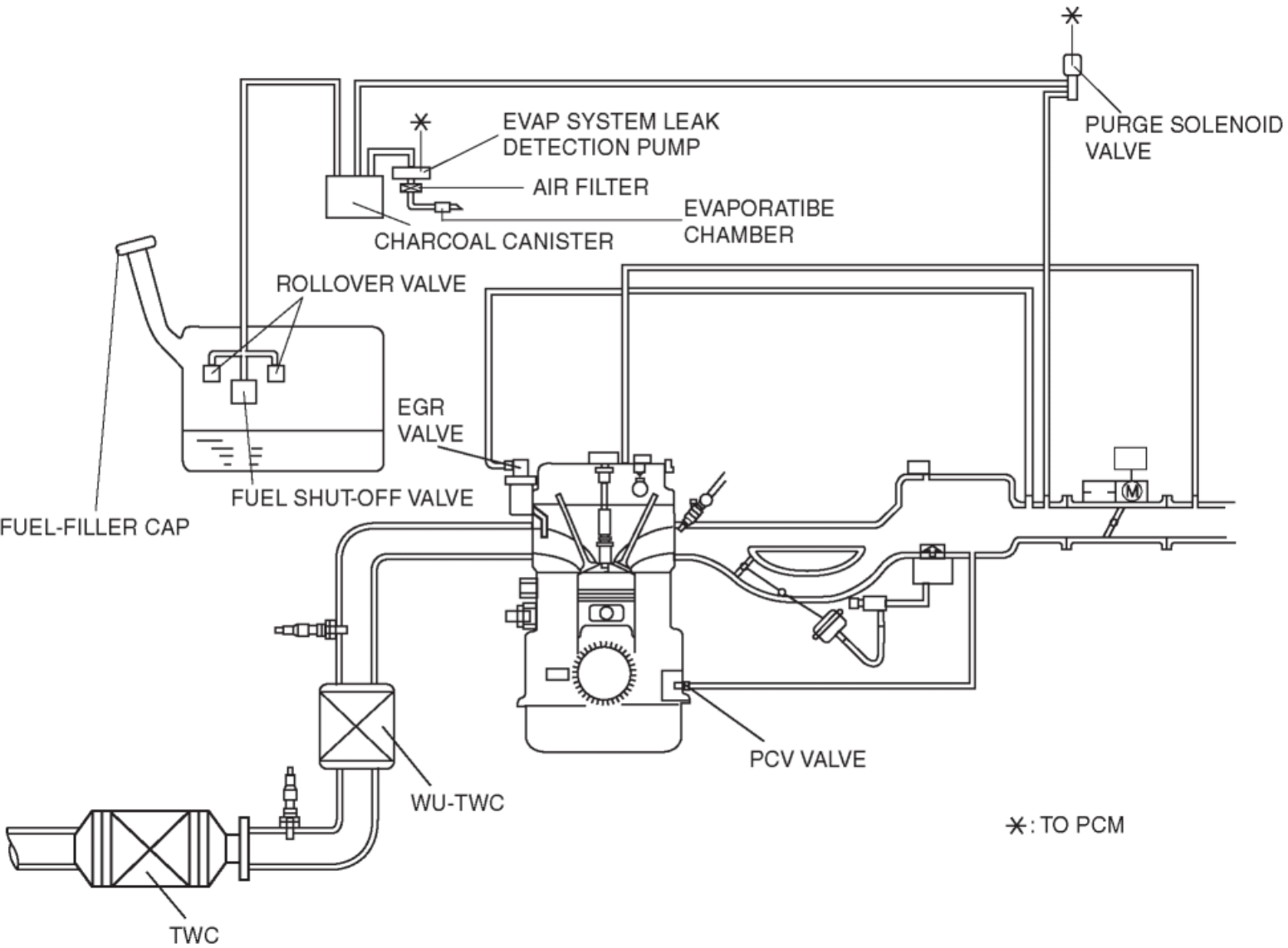
1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Disconnect the purge solenoid valve connector.



4. Disconnect the vacuum hose from the purge solenoid valve.
5. Remove the purge solenoid valve from the air hose.
6. Install in the reverse order of removal.

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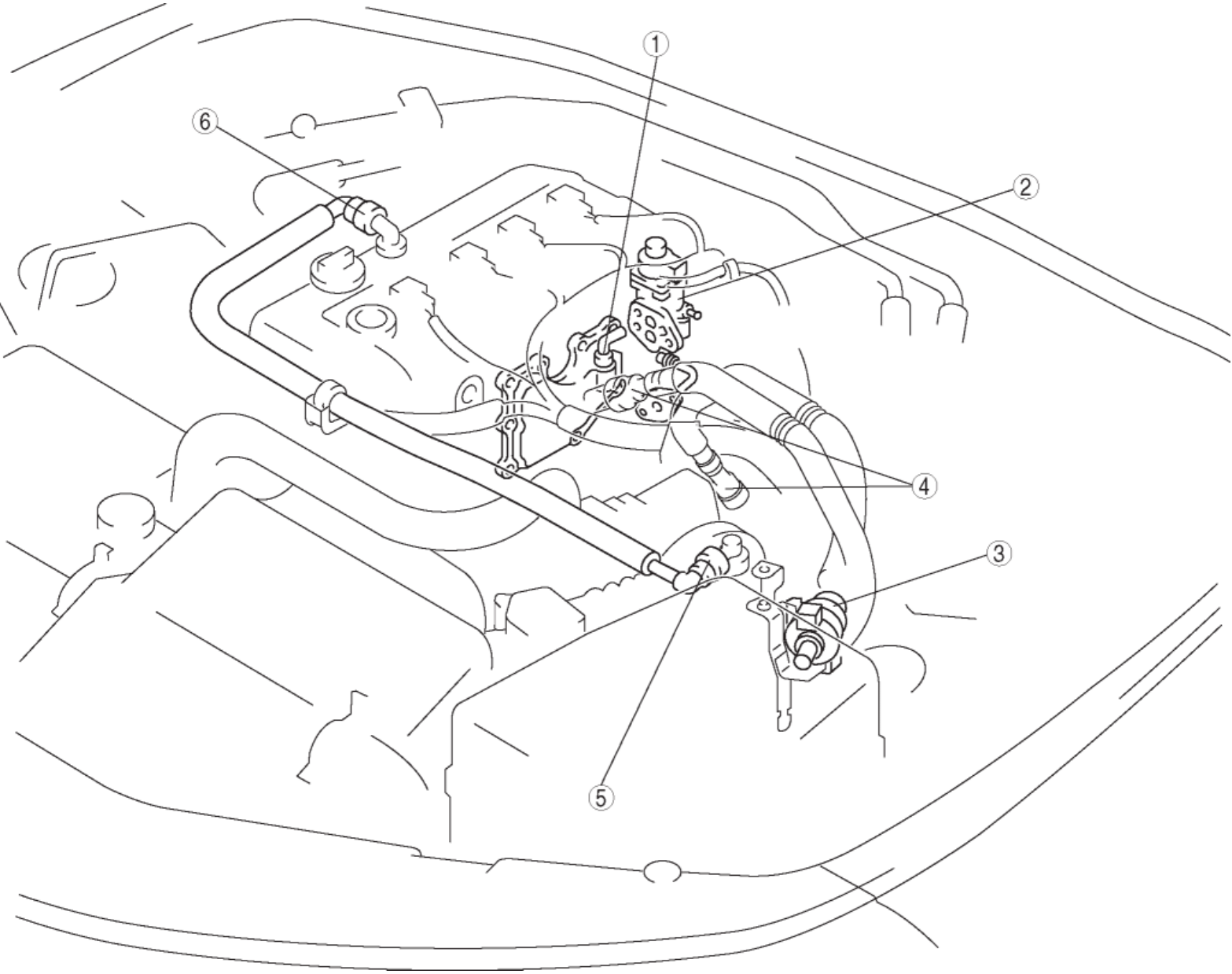
EMISSION SYSTEM DIAGRAM [LF]



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EMISSION SYSTEM LOCATION INDEX [LF]

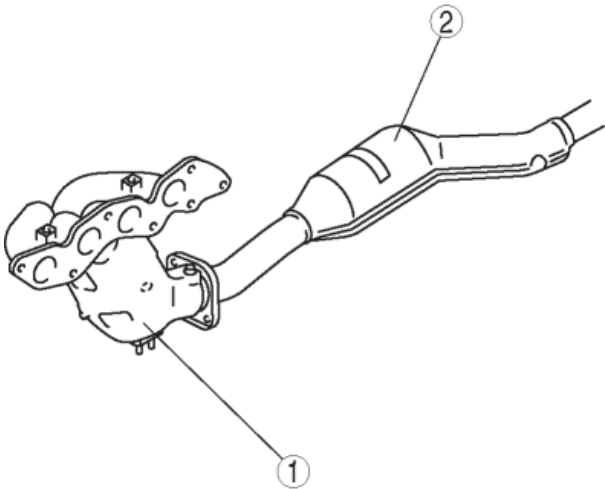
Engine Compartment Side



1PCV valve (See <a href="#">POSITIVE CRANKCASE VENTILATION (PCV) VALVE INSPECTION [LF].</a> )
2EGR valve (See <a href="#">EGR VALVE REMOVAL/INSTALLATION [LF].</a> ) (See <a href="#">EGR VALVE INSPECTION [LF].</a> )

3	Purge solenoid valve (See <a href="#">PURGE SOLENOID VALVE REMOVAL/INSTALLATION [LF].</a> ) (See <a href="#">PURGE SOLENOID VALVE INSPECTION [LF].</a> )
4	Quick release connector (Type A) (See <a href="#">QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/INSTALLATION [LF].</a> )
5	Quick release connector (Type B) (See <a href="#">QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/INSTALLATION [LF].</a> )
6	Quick release connector (Type D) (See <a href="#">QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/INSTALLATION [LF].</a> )

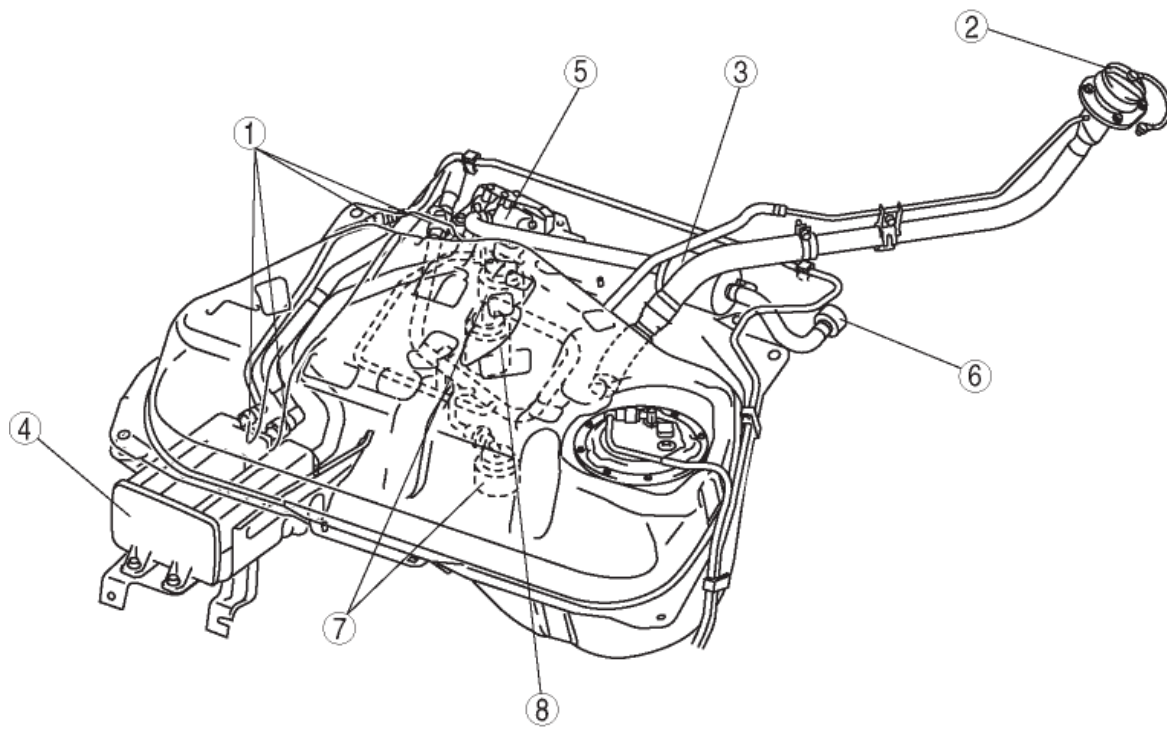
Exhaust System



1	WU-TWC (See <a href="#">WARM-UP THREE-WAY CATALYTIC CONVERTER (WU-TWC) INSPECTION [LF].</a> )
2	TWC

Fuel Tank Side





1 Quick release connector (Type C)

(See [QUICK RELEASE CONNECTOR \(EMISSION SYSTEM\) REMOVAL/INSTALLATION \[LF\].](#))

2 Fuel-filler cap

(See [FUEL-FILLER CAP INSPECTION \[LF\].](#))

3 Air filter

(See [AIR FILTER REMOVAL/INSTALLATION \[LF\].](#))

(See [AIR FILTER INSPECTION \[LF\].](#))

4 Charcoal canister

(See [CHARCOAL CANISTER REMOVAL/INSTALLATION \[LF\].](#))

(See [CHARCOAL CANISTER INSPECTION \[LF\].](#))

5 EVAP system leak detection pump

(See [EVAPORATIVE EMISSION \(EVAP\) SYSTEM LEAK DETECTION PUMP REMOVAL/INSTALLATION \[LF\].](#))

(See [EVAPORATIVE EMISSION \(EVAP\) SYSTEM LEAK DETECTION PUMP INSPECTION \[LF\].](#))

6 Evaporative chamber

(See [EVAPORATIVE CHAMBER REMOVAL/INSTALLATION \[LF\].](#))

(See [EVAPORATIVE CHAMBER INSPECTION \[LF\].](#))

7 Rollover valve

(See [ROLLOVER VALVE REMOVAL/INSTALLATION \[LF\].](#))

(See [ROLLOVER VALVE INSPECTION \[LF\].](#))

8 Fuel shut-off valve

(See [FUEL SHUT-OFF VALVE REMOVAL/INSTALLATION \[LF\].](#))

(See [FUEL SHUT-OFF VALVE INSPECTION \[LF\].](#))

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### ROLLOVER VALVE INSPECTION [LF]

#### NOTE:

- The rollover valve cannot be removed and inspected as it is built into the fuel tank.
1. Perform the fuel tank inspection. (See [FUEL TANK INSPECTION \[LF\]](#).)

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## 2008 - MX-5 - Engine

### ROLLOVER VALVE REMOVAL/INSTALLATION [LF]

#### NOTE:

- The rollover valve cannot be removed as it is built into the fuel tank.

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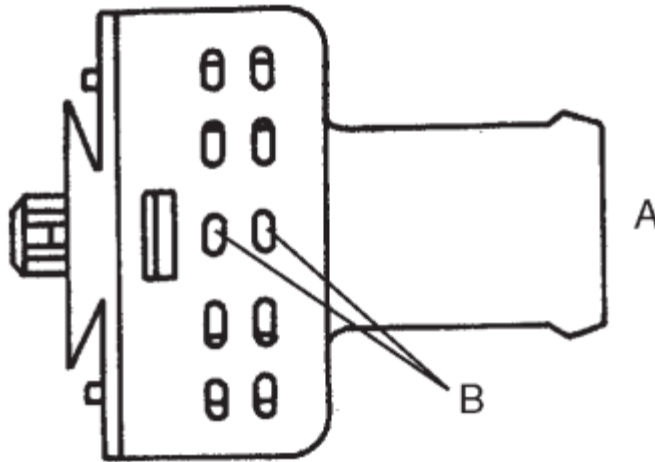
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### EVAPORATIVE CHAMBER INSPECTION [LF]

1. Remove the evaporative chamber.
2. Blow from port A and verify that there is airflow from port B.
  - If not as specified, replace the evaporative chamber.



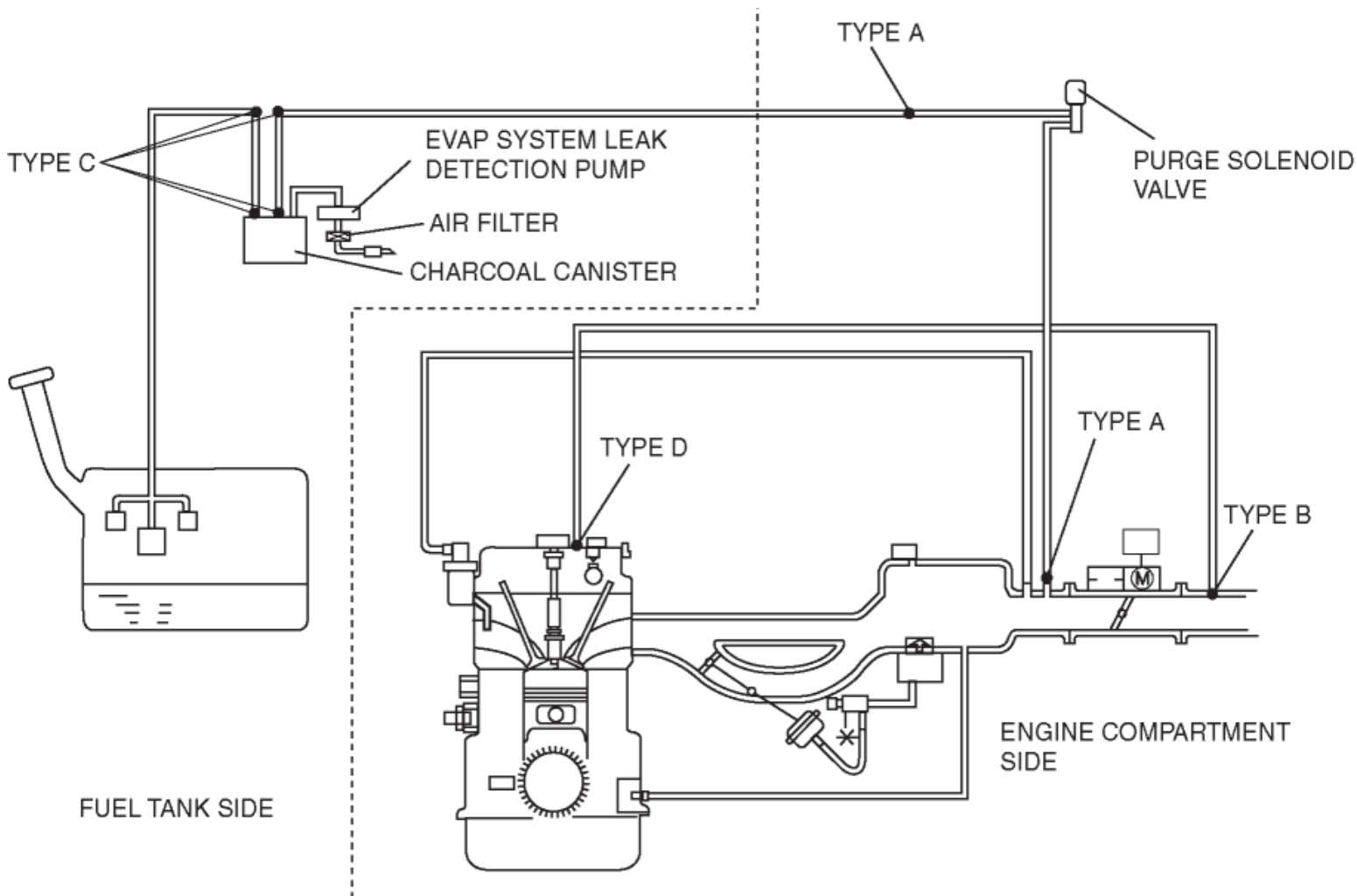
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### QUICK RELEASE CONNECTOR (EMISSION SYSTEM) REMOVAL/INSTALLATION [LF]

#### Quick Release Connector Type

##### CAUTION:

- There are four types of quick release connectors. Verify the type and location, and install/remove properly.



#### Type A Removal

##### CAUTION:

- The quick release connector may be damaged if the release tab is bent excessively. Do not expand the release tab over the stopper.

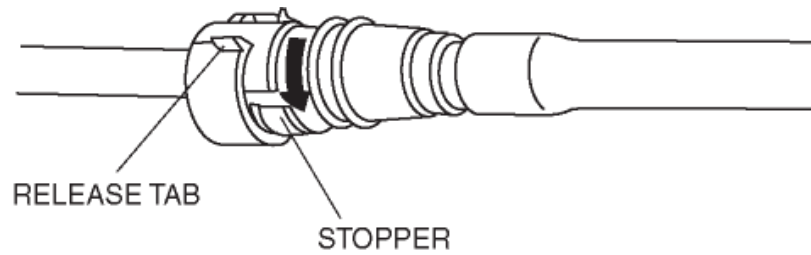
##### NOTE:

- The evaporative hose can be removed by pushing it to the joint port side to release the lock.

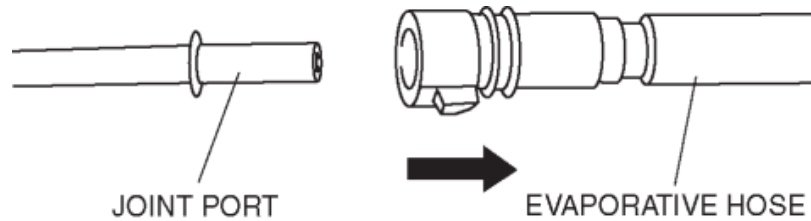
1. Rotate the release tab on the quick release connector to the stopper position.

**NOTE:**

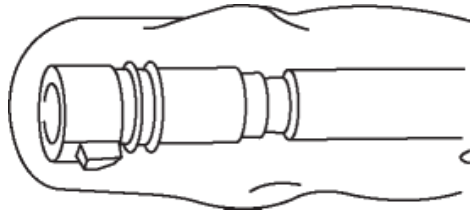
- The retainer is attached to the pipe even after the connector is disconnected.



2. Pull out the evaporative hose straight from the joint port and disconnect it.



3. Cover the disconnected quick release connector and joint port with vinyl sheeting or a similar material to prevent it from scratches or dirt.



**Type B Removal**

1. Squeeze the release tab until the locks are released.

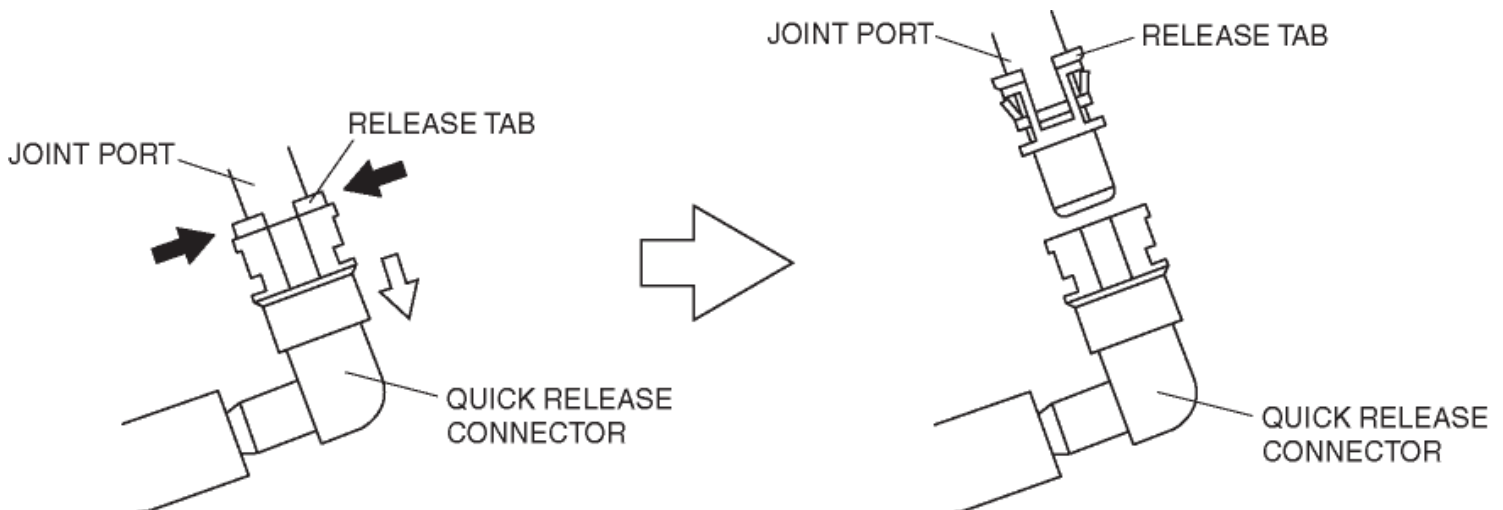
**NOTE:**

- The retainer has two internal locking tabs which retain the joint port. Be sure that the squeezing place on the retainer is squeezed until it can be released from the joint port.

2. Pull the quick release connector straight outward.

**NOTE:**

- The retainer is attached to the pipe even after the connector is disconnected.



3. Cover the disconnected quick release connector and joint port with vinyl sheeting or a similar material to prevent it from becoming scratched or dirty.

## Type C Removal

### CAUTION:

- Be careful not to damage the pipe when unlocking the retainer.

### NOTE:

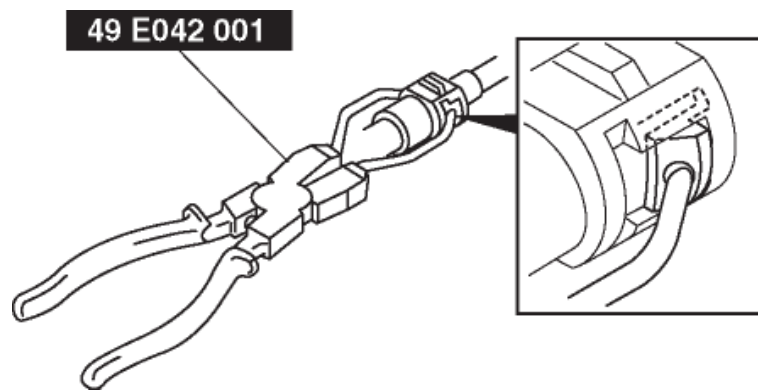
- If the quick release connector is removed, replace the retainer with a new one.

1. Follow "BEFORE SERVICE PRECAUTION" and remove dirt from the connecting surfaces before performing any work operations.

### NOTE:

- The retainer is attached to the pipe even after the connector is disconnected.

2. Set the **SST** parallel to the quick release connector.



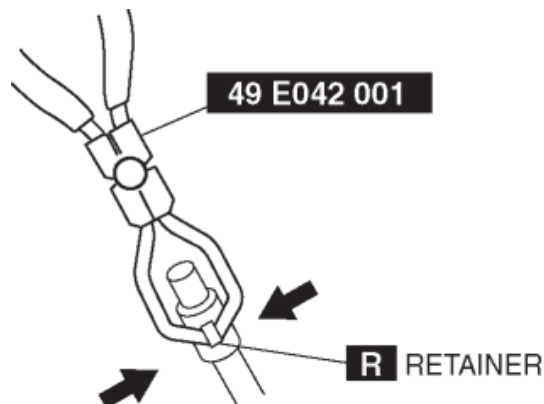
### NOTE:

- The quick release connector can be removed by pushing the center of the retainer tabs.

3. Hold the center of the retainer tabs with the **SST** ends and press the retainer.

4. Pull the connector side and disconnect the quick release connector.

5. Raise a retainer tab using the **SST** and remove the retainer.



6. Cover the disconnected quick release connector and joint port with vinyl sheeting or a similar material to prevent it from becoming scratched or dirty.

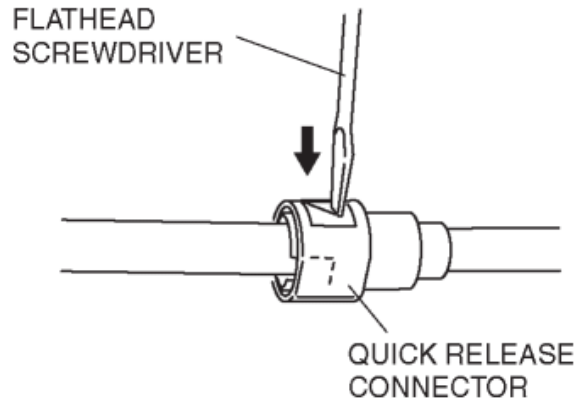
## Type D Removal

### CAUTION:



- When releasing the retainer locks, take extreme care not to damage the evaporative hose.

1. Release the locks between the retainer and joint port by pressing each retainer lock one by one using a flathead screwdriver or a similar tool.



2. Pull out the hose straight from the joint port and disconnect it.

**NOTE:**

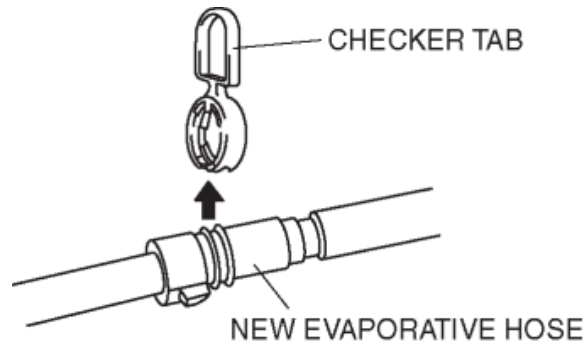
- The retainer is attached to the pipe even after the connector is disconnected.

3. Cover the disconnected quick release connector and joint port with vinyl sheeting or a similar material to prevent it from becoming scratched or dirty.

## Type A Installation

**NOTE:**

- If the quick release connector O-ring is damaged or has slipped, replace the evaporative hose.
- A checker tab is integrated with the quick release connector for new evaporative hoses. Remove the checker tab from the quick release connector after the connector is completely engaged with the joint port.



1. Inspect the evaporative hose and joint port sealing surface for damage and deformation.

- If there is any malfunction, replace it with a new one.

2. Apply a small amount of clean engine oil to the sealing surface of the joint port.

3. Reconnect the evaporative hose straight to the joint port until a click is heard.

**NOTE:**

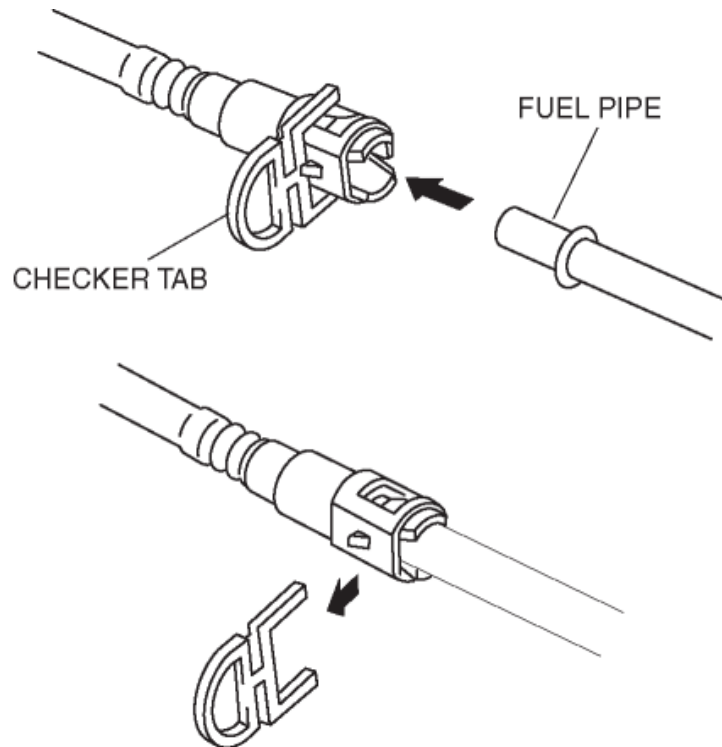
- If the quick release connector does not move at all, disconnect it, verify that the O-ring is not damaged or has not slipped, and then reconnect the quick release connector.

4. Lightly pull and push the quick release connector a few times by hand, and then verify that it can move **2.0—3.0 mm {0.08—0.12 in}** and is connected securely.

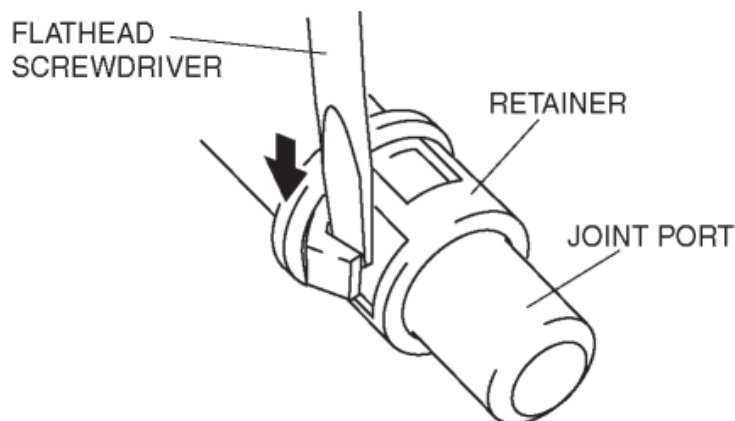
## Type B Installation

### NOTE:

- If the quick release connector O-ring is damaged or has slipped, replace the evaporative hose.
- When replacing with a new evaporative hose, disengage the release tabs from the joint port.
- A checker tab is integrated with the quick release connector for new evaporative hoses. Remove the checker tab from the quick release connector after the connector is completely engaged with the joint port.



1. When newly replacing the quick release connector, remove the release tab using the following procedure.
  - a. Widen the retainer lock using a flathead screwdriver, then pull out the release tab from the joint port and remove it.



2. Inspect the quick release connector and joint port sealing surface for damage and deformation.
  - If there is any malfunction, replace it with a new one.
3. Apply a small amount of clean engine oil to the sealing surface of the joint port.
4. Reconnect the quick release connector straight to the joint port until a click is heard.

### NOTE:

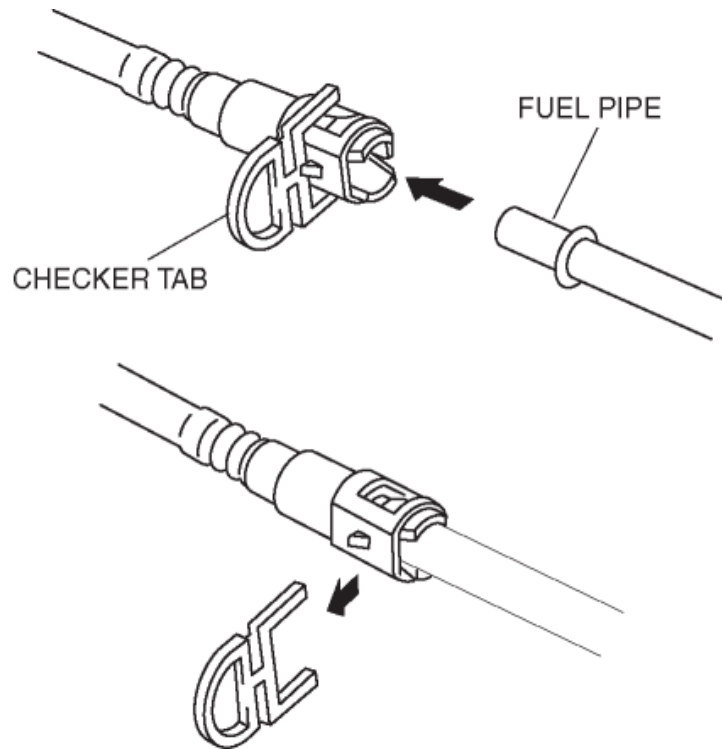
- If the quick release connector does not move at all, disconnect it, verify that the O-ring is not damaged or has not slipped, and then reconnect the quick release connector.

5. Lightly pull and push the quick release connector a few times by hand, and then verify that it is connected securely.

## Type C Installation

### NOTE:

- If the quick release connector O-ring is damaged or has slipped, replace the piping component.
- A checker tab is integrated with the quick release connector for new fuel hoses and evaporative hoses. Remove the checker tab from the quick release connector after the connector is completely engaged with the fuel pipe.



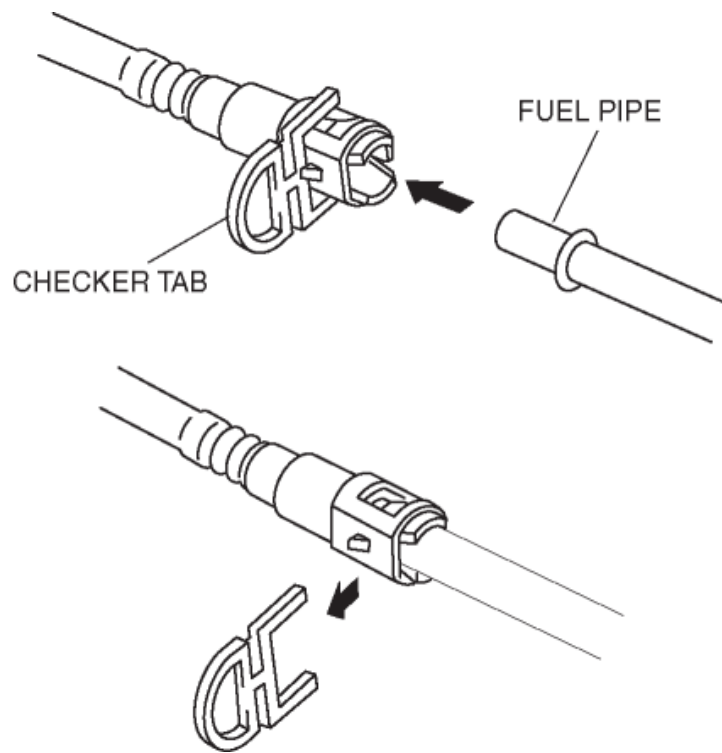
### CAUTION:

- Be sure to replace the retainer with a new one to prevent gas leakage.
1. Install a new retainer to the quick release connector.
  2. Reconnect the hose straight to the pipe until a click is heard.
  3. Lightly pull and push the quick release connector a few times by hand, and then verify that it is connected securely.

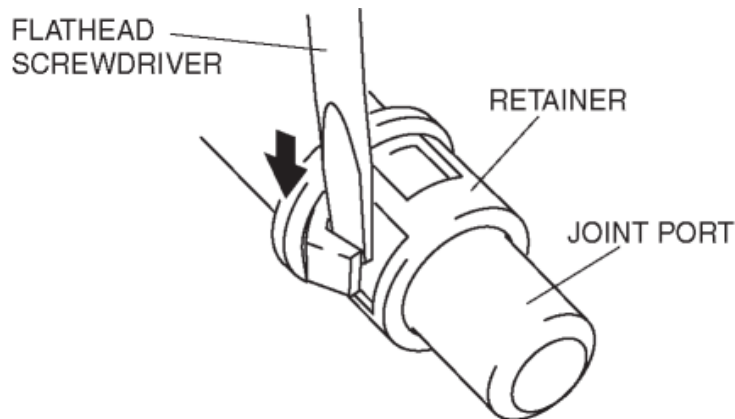
## Type D Installation

### NOTE:

- If the quick release connector O-ring is damaged or has slipped, replace the evaporative hose.
- When replacing with a new evaporative hose, disengage the release tabs from the join port.
- A checker tab is integrated with the quick release connector for new evaporative hoses. Remove the checker tab from the quick release connector after the connector is completely engaged with the joint port.



1. When newly replacing the quick release connector, remove the release tab using the following procedure.
  - a. Widen the retainer lock using a flathead screwdriver, then pull out the release tab from the joint port and remove it.



2. Inspect the quick release connector and joint port sealing surface for damage and deformation.
  - If there is any malfunction, replace it with a new one.
3. Apply a small amount of clean engine oil to the sealing surface of the joint port.
4. Reconnect the quick release connector straight to the joint port until a click is heard.

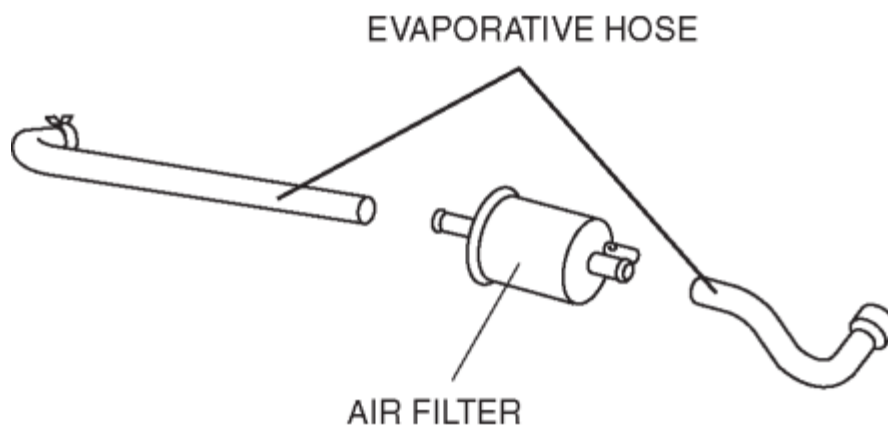
**NOTE:**

- If the quick release connector does not move at all, disconnect it, verify that the O-ring is not damaged or has not slipped, and then reconnect the quick release connector.
5. Lightly pull and push the quick release connector a few times by hand, and then verify that it is connected securely.

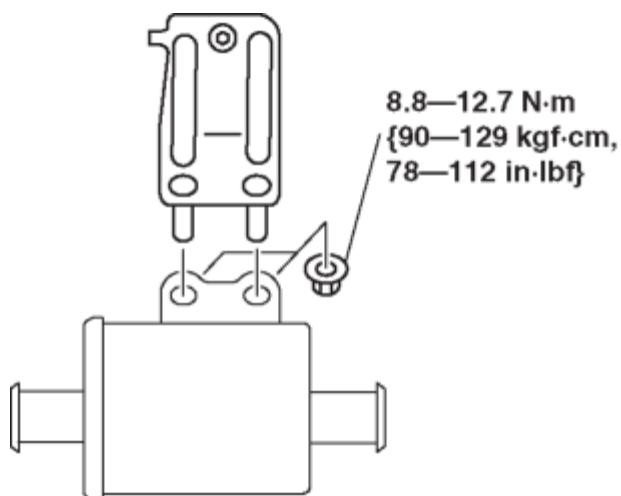
## 2008 - MX-5 - Engine

### AIR FILTER REMOVAL/INSTALLATION [LF]

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Disconnect the evaporative hose from the air filter.



4. Cover the evaporative hose with vinyl sheets or the like to prevent them from being scratched or contaminated with foreign material.
5. Remove the air filter.



6. Install in the reverse order of removal.

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## 2008 - MX-5 - Engine

### FUEL SHUT-OFF VALVE REMOVAL/INSTALLATION [LF]

#### NOTE:

- The fuel shut-off valve cannot be removed as it is built into the fuel tank.

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## 2008 - MX-5 - Engine

### FUEL SHUT-OFF VALVE INSPECTION [LF]

#### NOTE:

- The fuel shut-off valve cannot be removed and inspected as it is built into the fuel tank.
1. Perform the fuel tank inspection. (See [FUEL TANK INSPECTION \[LF\]](#).)

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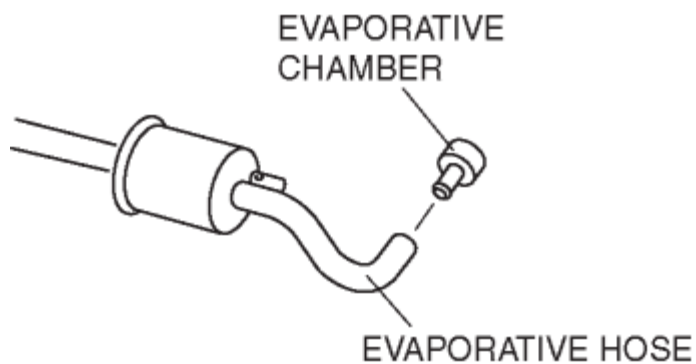
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## 2008 - MX-5 - Engine

### EVAPORATIVE CHAMBER REMOVAL/INSTALLATION [LF]

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Disconnect the evaporative hose.
4. Remove the evaporative chamber.



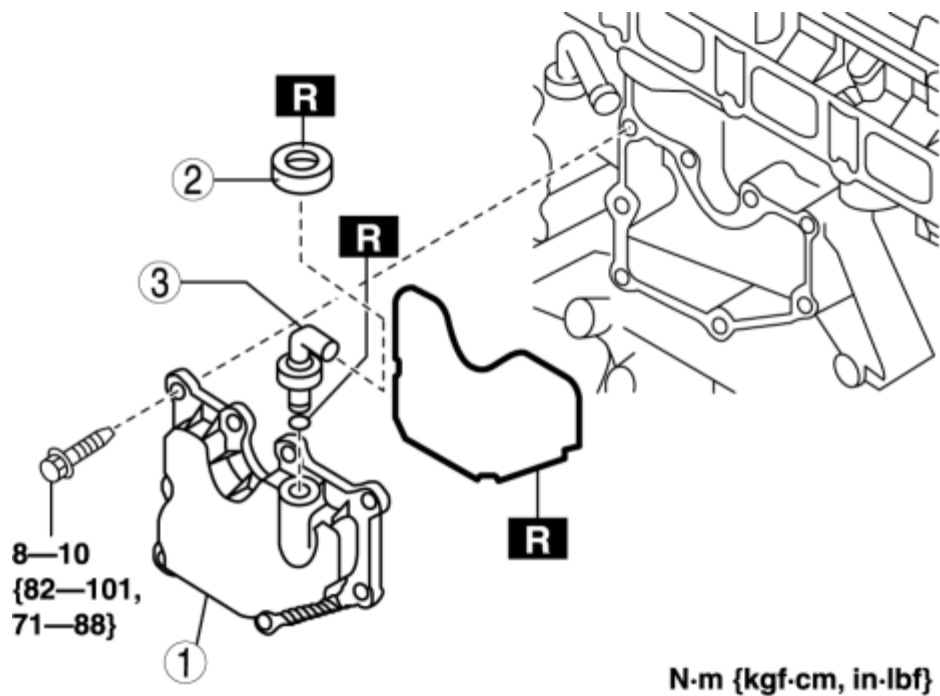
5. Cover the evaporative hose with vinyl sheets or the like to prevent them from being scratched or contaminated with foreign material.
6. Install in the reverse order of removal.



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POSITIVE CRANKCASE VENTILATION (PCV) VALVE REMOVAL/INSTALLATION [LF]

- 1. Remove the battery cover. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
- 2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
- 3. Remove the intake manifold and the fuel distributor component as a single unit. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
- 4. Remove in the order indicated in the table.



1	Oil separator
2	Retainer (See <a href="#">Retainer Removal Note.</a> ) (See <a href="#">Retainer Installation Note.</a> )
3	PCV valve

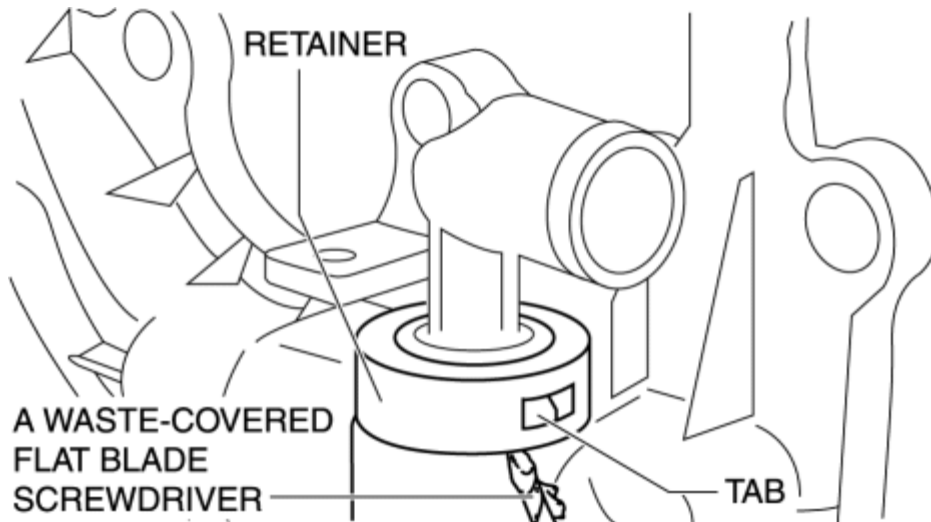
- 5. Install in the reverse order of removal.

## Retainer Removal Note

### CAUTION:

- Be sure to follow the removal procedures below to prevent the leakage of blow-by gas caused by the damage to the tab of the oil separator or the oil separator itself.

1. Insert a flat blade screwdriver with its tip wrapped in a waste cloth into the gap between the retainer and the oil separator as shown in the figure.



2. Spread the side surface of the retainer outward to dismount it with attention to the tab.

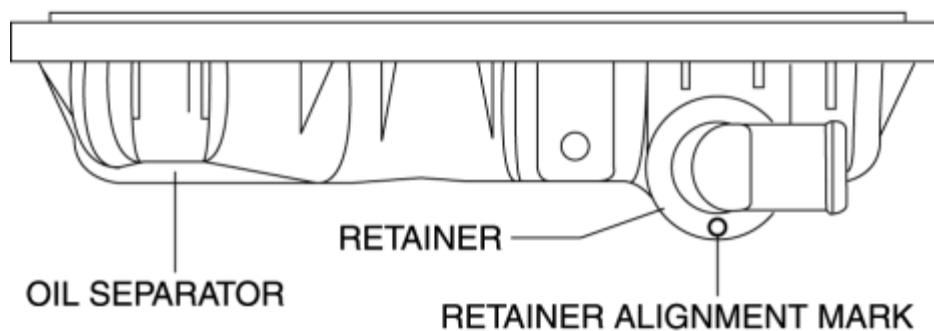
## Retainer Installation Note

### CAUTION:

- Be sure to replace the old retainer with a new one to prevent the escape of blow-by gas. Reinstalling the old retainer will reduce airtightness.

1. Make sure that the retainer alignment mark is directed as shown in the left diagram before install the retainer to the oil separator.

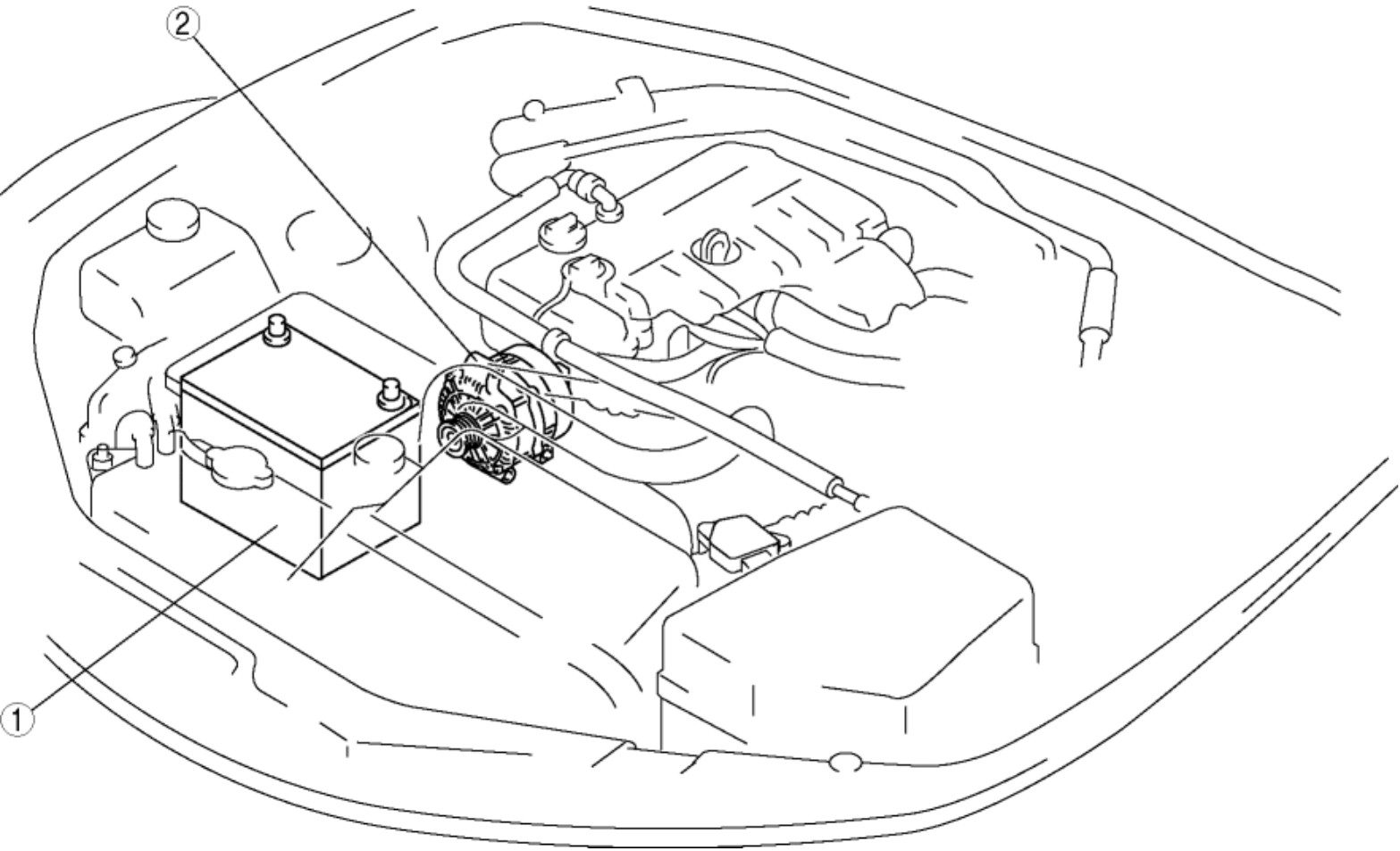
### OIL SEPARATOR UPPER CHART





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CHARGING SYSTEM LOCATION INDEX [LF]



1	Battery (See <a href="#">BATTERY REMOVAL/INSTALLATION [LF]</a> .) (See <a href="#">BATTERY INSPECTION [LF]</a> .) (See <a href="#">BATTERY RECHARGING [LF]</a> .)
2	Generator (See <a href="#">GENERATOR REMOVAL/INSTALLATION [LF]</a> .) (See <a href="#">GENERATOR INSPECTION [LF]</a> .) (See <a href="#">GENERATOR DISASSEMBLY/ASSEMBLY [LF]</a> .)



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GENERATOR REMOVAL/INSTALLATION [LF]

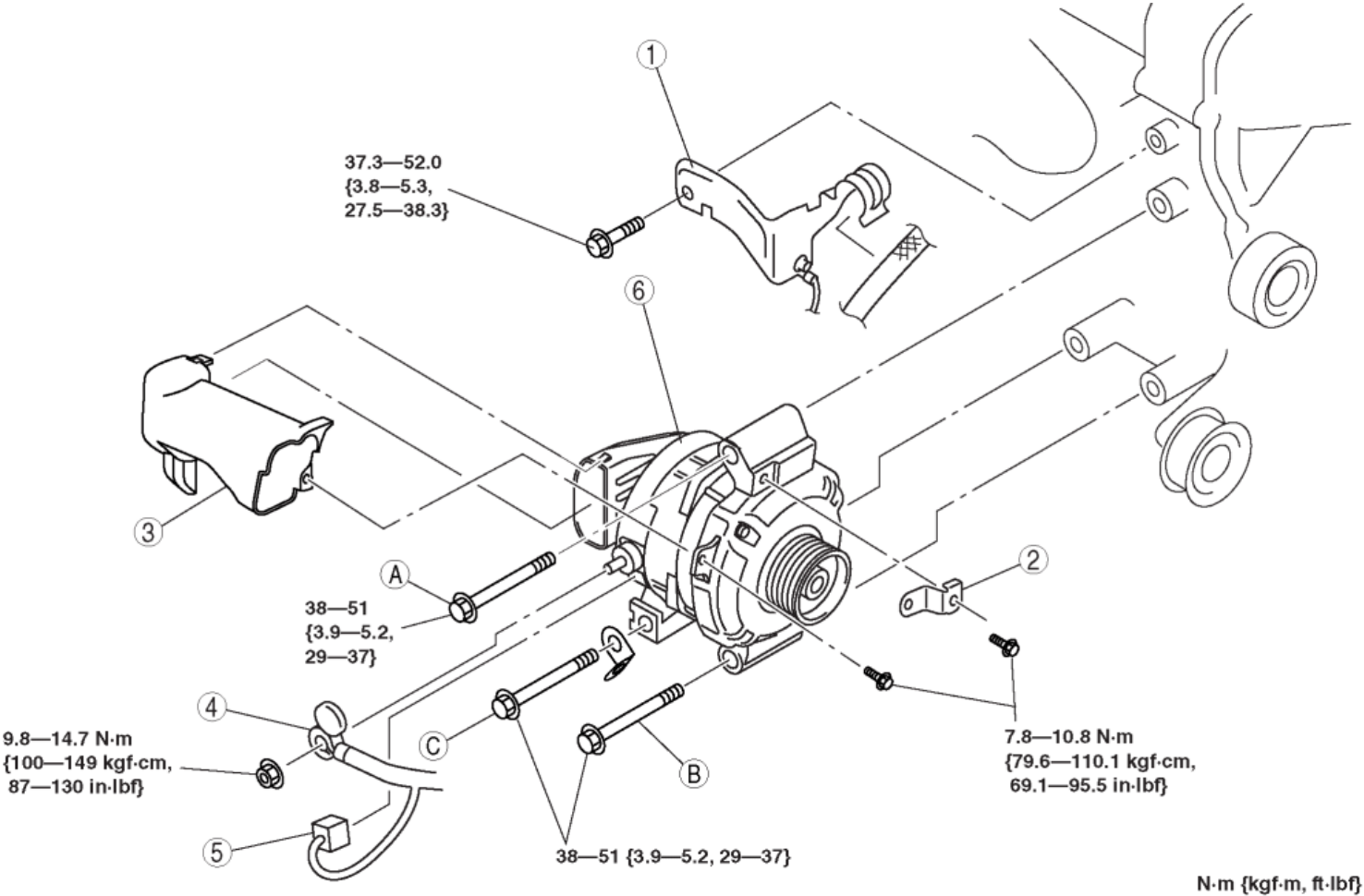
WARNING:

- Remove and install all parts when the engine is cold, otherwise they can cause severe burns or serious injury.
- When the battery cables are connected, touching the vehicle body with generator terminal B will generate sparks. This can cause personal injury, fire, and damage to the electrical components. Always disconnect the battery negative cable before performing the following operation.

CAUTION:

- The generator can be damaged by the heat from the exhaust manifold. Make sure the generator duct is installed securely.

1. Remove the battery and battery tray. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
2. Remove the drive belt. (See [DRIVE BELT REPLACEMENT \[LF\]](#).)
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.



1	P/S pressure hose bracket
2	Generator bracket
3	Generator duct

4	B terminal cable
5	Generator connector
6	Generator (See <a href="#">GENERATOR REMOVAL/INSTALLATION [LF]</a> .)

### Generator Installation Note

1. Tighten bolt A temporarily.
2. Tighten bolt B, C to the specified tightening torque.
3. Tighten bolt A to the specified tightening torque.

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## 2008 - MX-5 - Engine

### GENERATOR INSPECTION [LF]

#### CAUTION:

1. Do not apply direct battery positive voltage to the generator terminal D, otherwise it could cause damage to the internal parts (power transistor) of the generator.

#### Generator Warning Light

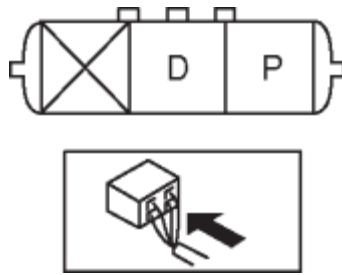
1. Verify that the battery is fully charged.
2. Verify that the drive belt deflection/tension is correct. (See [DRIVE BELT INSPECTION \[LF\]](#).)
3. With the ignition switch turned to the ON position, verify that the generator warning light illuminates.
  - If it does not illuminate, inspect the generator warning light and the wiring harness.
    1. If the generator warning light and the wiring harness are normal, inspect the PCM.
4. Verify that the generator warning light goes out after the engine is started.
  - If it does not go out, inspect if any one of the following DTCs in the on-board diagnostic system are displayed: P0112, P0113, P2502, P2503, P2504. (See [DTC TABLE \[LF\]](#).)

#### Generator

##### Voltage

1. Verify that the battery is fully charged.
2. Verify that the drive belt deflection/tension is correct. (See [DRIVE BELT INSPECTION \[LF\]](#).)
3. Turn off all electrical loads.
4. Start the engine.
5. Verify that the generator rotates smoothly without any noise while the engine is running.
  - If there is any noise, find the cause and repair or replace the generator.
6. Measure the voltage at each terminal using a tester.





#### **Generator standard voltage [IG-ON]**

- Terminal B: B+
- Terminal P: Approx. 1 V or less
- Terminal D: Approx. 0 V

#### **Generator standard voltage [Idle, 20 °C {68 °F}]**

- Terminal B: 13—15 V
- Terminal P: Approx. 3—8 V
- Terminal D: Turn the electrical loads (headlights, blower motor, rear window defroster) on and verify that the voltage reading increases.

#### **Current**

##### **NOTE:**

1. Since the charging current decreases rapidly after starting the engine, carry out the following procedure quickly, and read the maximum current value.
1. Verify that the battery is fully charged.
2. Verify that the drive belt deflection/tension is correct. (See **DRIVE BELT INSPECTION [LF]**.)
3. Disconnect the negative battery cable.
4. Connect a tester, which can read **120 A or more**, between generator terminal B and the wiring harness.
5. Connect the negative battery cable. (See **BATTERY REMOVAL/INSTALLATION [LF]**.)
6. Turn off all electrical loads.
7. Start the engine.
8. Increase engine speed to **2,500 rpm**.

##### **NOTE:**

1. When the electrical load of the vehicle is low, the specified current will not be verified although the generator is normal. In this case, increase the electrical load (by turning on the headlight and leave it for a while, then discharge the battery or by similar methods) and recheck.
2. When the generator itself or the ambient temperature are too high, the specified current cannot be verified. In this case, cool down the generator and recheck.

9. Turn the following electrical loads on and verify that the current reading increases more than the minimum value indicated below.

1. If it is not as specified, go to the PCM and generator shearing inspection. (See [GENERATOR INSPECTION \[LF\]](#).)
1. Headlights (high-beam)

2. Blower motor (HI)

3. Rear window defroster

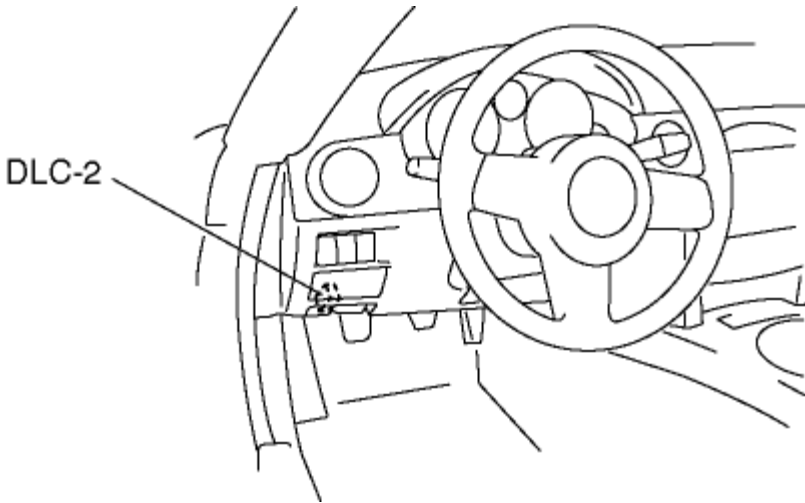
4. Brake light

**Generator generated current minimum value**

- 70 % of the nominal output current (nominal output current: 100 A)
- [ambient temp. 20 °C {68 °F}, voltage 13.0—15.0 V, both engine and generator are hot]

**PCM and generator shearing inspection**

1. Connect the M-MDS to the DLC-2.



2. Inspect as follows:

Step	Inspection		Action
1	Measure the generator terminal B voltage when the electrical loads <sup>*1</sup> are on and off.	15 V or more	Go to Step 2.
		13—15 V	Normal <sup>*2</sup>
		13 V or less	Go to Step 3.

2	Monitor the ALTT V PID using the M-MDS, or measure the voltage of PCM terminal 2AJ using a tester. Is the voltage between 13 and 15 V ?	Yes	Go to Step 4.
		No	PCM input error.
3	Monitor the ALTT V PID using the M-MDS, or measure the voltage of PCM terminal 2AJ using a tester. Is the voltage between 13 and 15 V ?	Yes	Go to Step 5.
		No	PCM input error.
4	Monitor the ALTF PID using the M-MDS, or calculate the duty value of the PCM terminal 2AI using an oscilloscope. Is the duty value 100 % ?	Yes	PCM input error.
		No	PCM, generator, or both are not normal.
	$\frac{A}{B} \times 100 (\%) = \text{DUTY} (\%)$		
5	Monitor the ALTF PID using the M-MDS, or calculate the duty value of the PCM terminal 2AI using an oscilloscope. Is the duty value 0 % ?	Yes	PCM input error.
		No	PCM, generator, or both are not normal.
	$\frac{A}{B} \times 100 (\%) = \text{DUTY} (\%)$		

\*1

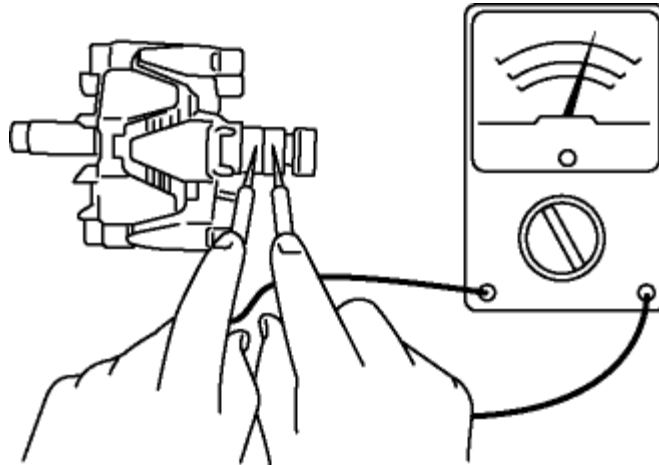
**Headlights, blower motor, rear window defroster, and brake light.**

If the generator field coil duty value does not change when electrical loads (such as headlights, blower motor, rear window defroster, brake light) are on or off, inspection with discharged battery is needed.

## Generator Inner Parts

### Rotor

1. Measure the resistance between the slip rings using a tester.

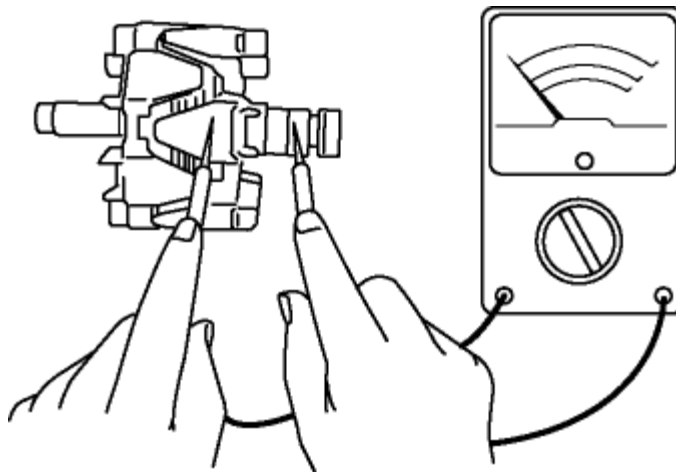


- If not within the specification, replace the rotor.

**Generator rotor resistance (between slip rings) [20 °C {68 °F}]**

- 2.0—2.3 ohm

2. Verify that there is no continuity between the slip ring and core using a tester.



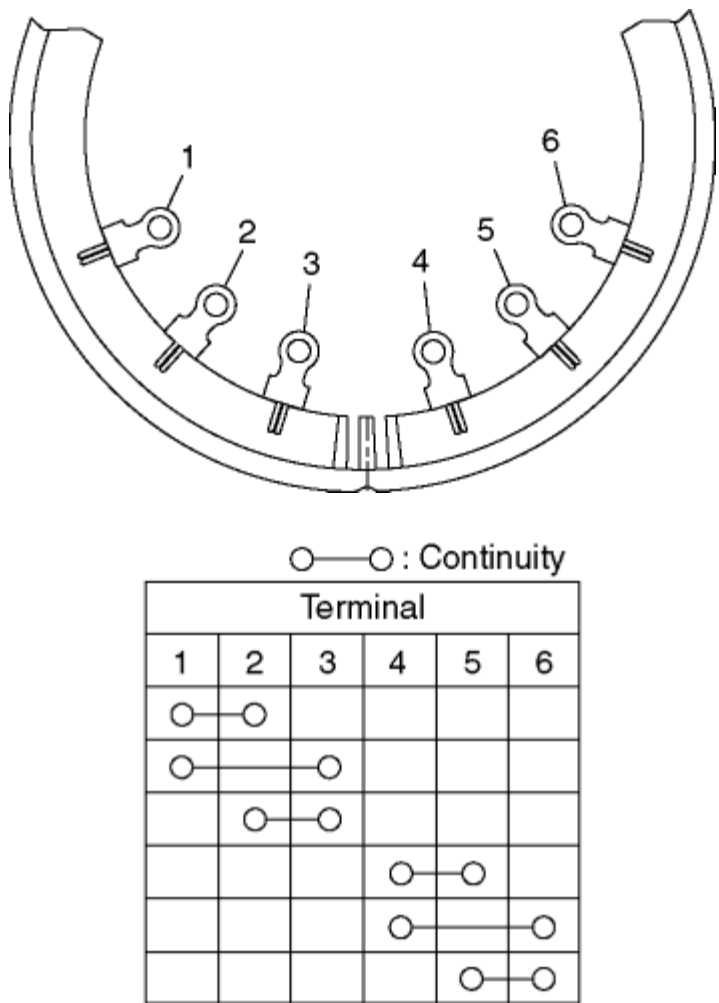
- If there is continuity, replace the rotor.

3. Inspect the slip ring surface condition.

- If the slip ring surface is rough, use a lathe or fine sandpaper to repair it.

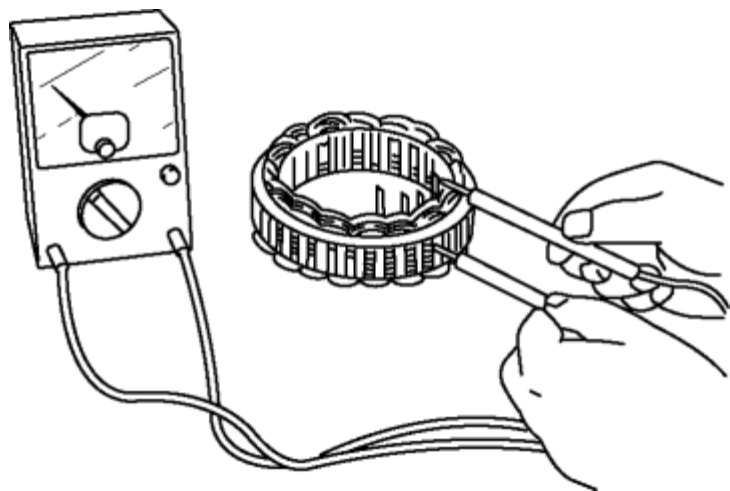
**Stator coil**

1. Verify that the continuity is as indicated in the table.



- If there is any malfunction, replace the stator.

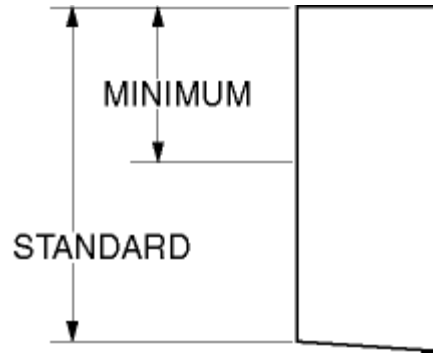
2. Verify that there is no continuity between the stator coil leads and core using a tester.



- If there is continuity, replace the stator coil.

## Brush

1. Inspect brushes for wear.



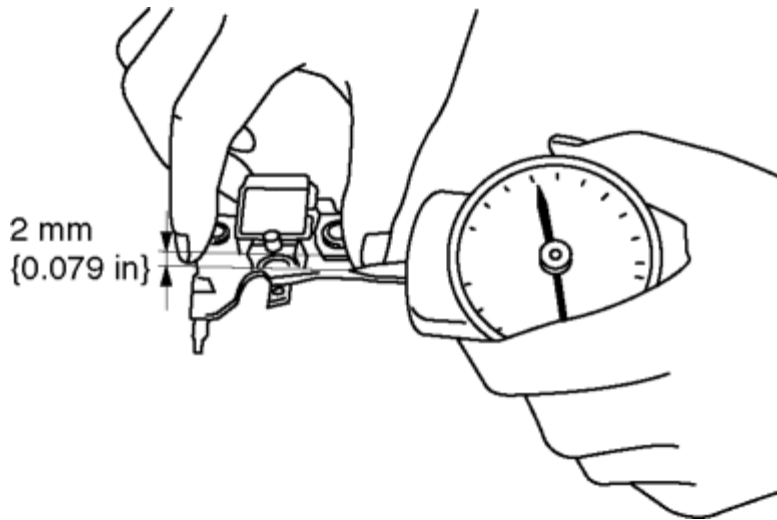
- If any brush is worn almost to or beyond the limit, replace all of the brushes.

### Generator brush length

- Standard: 22.5 mm {0.89 in}
- Minimum: 5.0 mm {0.20 in}

## Brush spring

1. Measure the force of the brush spring using a spring pressure gauge.
2. Read the spring pressure gauge at the brush tip projection of **2 mm {0.079 in}**.



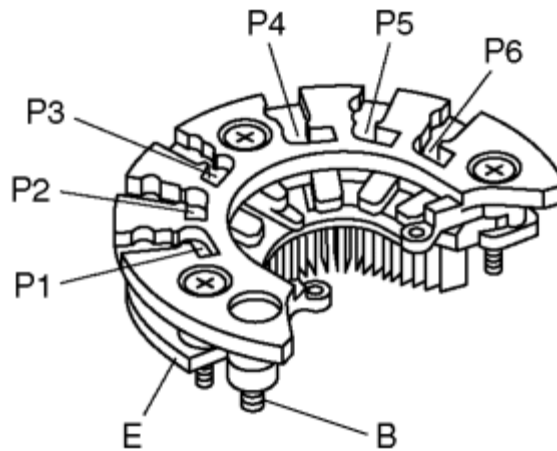
- Replace the brush spring if necessary.

### Generator brush spring force

- Standard: 4.1—5.3 N {0.42—0.54 kgf, 0.92—1.19 lbf}
- Minimum: 1.7 N {0.17 kgf, 0.38 lbf}

## Rectifier (Using an analog circuit tester)

1. Inspect for continuity of the diodes using an analog circuit tester.



- If not as specified, replace the rectifier.

### Specification

Negative	Positive	Continuity
E	P1, P2, P3, P4, P5, P6	Yes
B		No
P1, P2, P3, P4, P5, P6	E	No
	B	Yes

### Rectifier (Using a digital circuit tester)

1. Inspect for continuity of the diodes using a digital circuit tester.

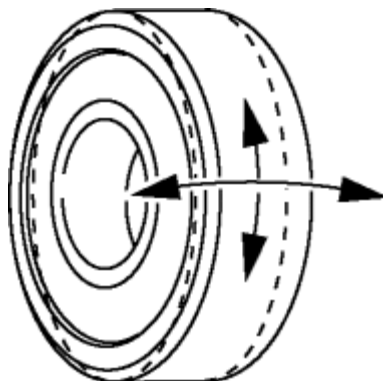
- If not as specified, replace the rectifier.

### Specification

Negative	Positive	Continuity
E	P1, P2, P3, P4, P5, P6	No
B		Yes
P1, P2, P3, P4, P5, P6	E	Yes
	B	No

## Bearing

1. Inspect for abnormal noise, looseness, and sticking.



- Replace the bearing if necessary.

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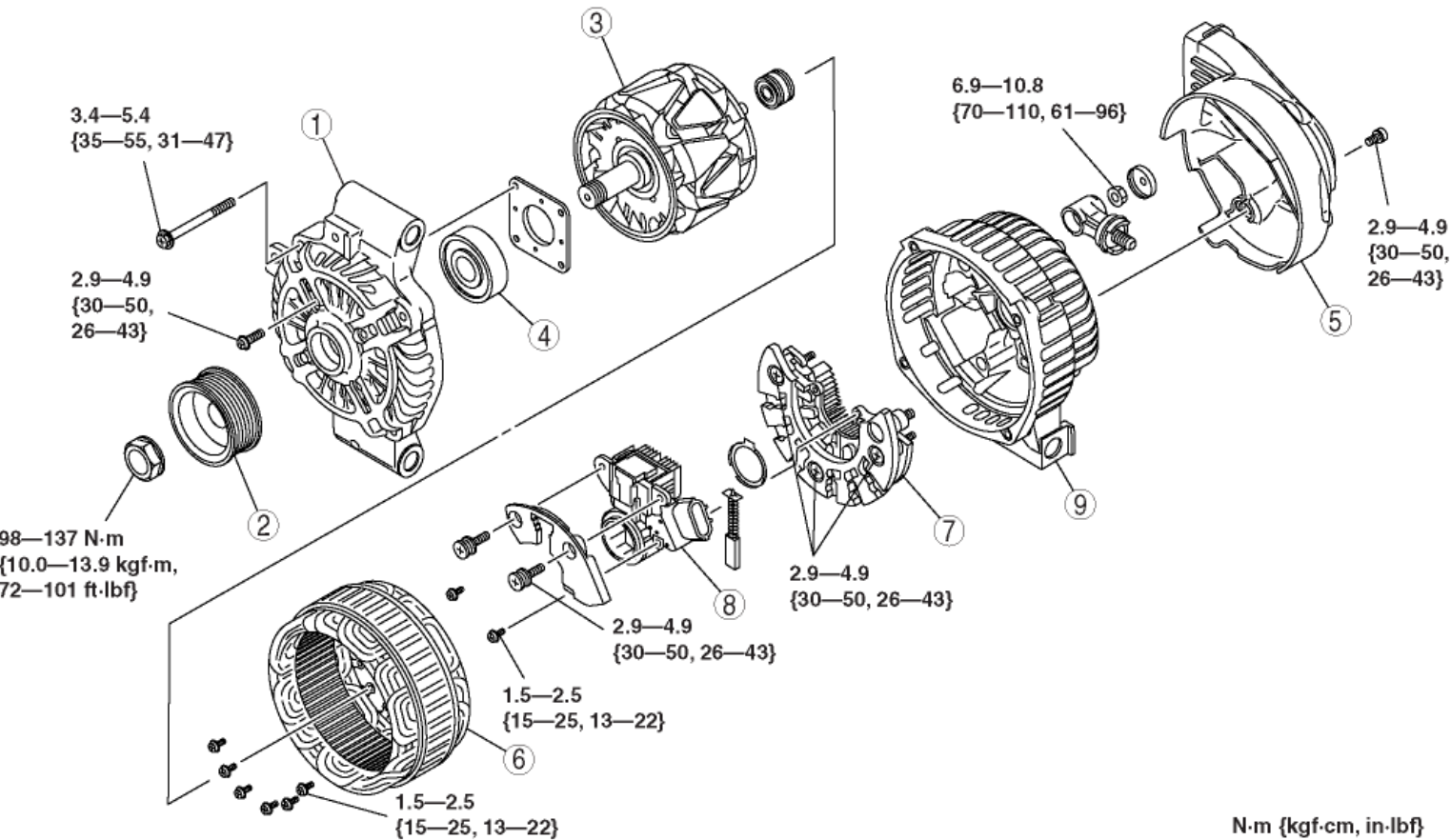
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GENERATOR DISASSEMBLY/ASSEMBLY [LF]

CAUTION:

- Melt the solder quickly, otherwise the diodes (rectifier) and regulator will be damaged by excessive heat.

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



1	Front cover
2	Pulley
3	Rotor
4	Bearing
5	Generator heat insulator
6	Stator coil
7	Rectifier
8	Brush holder

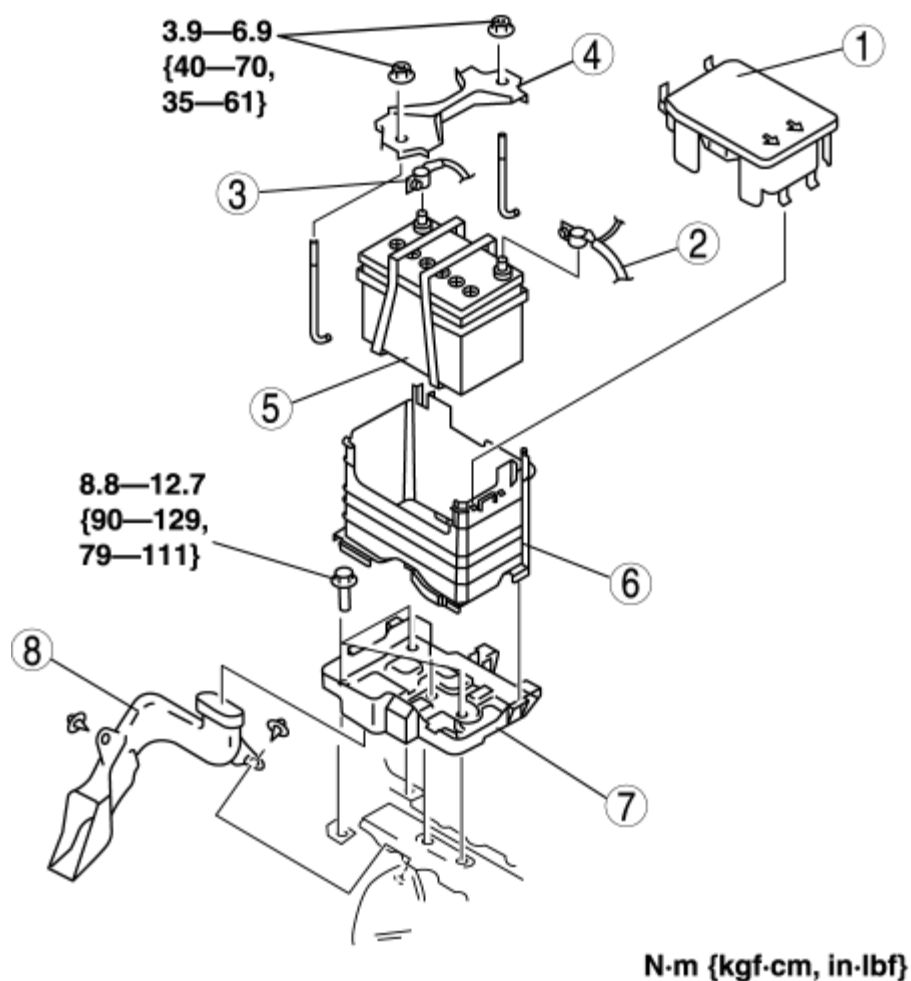


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### BATTERY REMOVAL/INSTALLATION [LF]

#### WARNING:

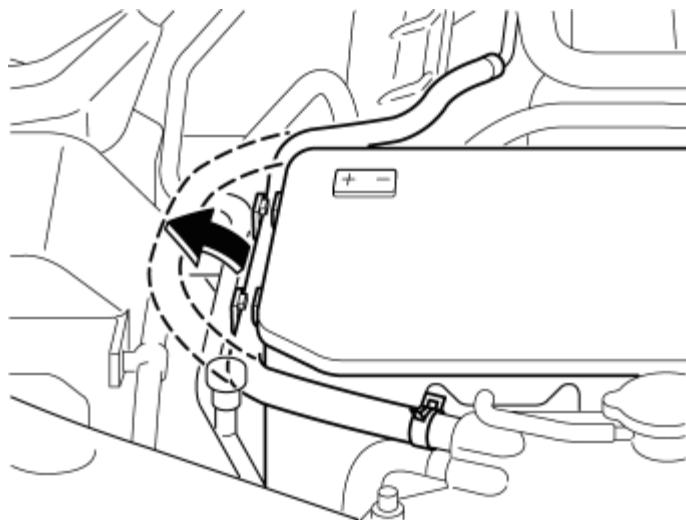
1. For vehicles with DSC, if the negative battery cable is disconnected, the stored initial position of the steering angle sensor will be cleared and the DSC will not operate properly, making the vehicle unsafe to drive. Perform the steering angle sensor initialization procedure after connecting the negative battery cable.
1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. Perform the steering angle sensor initialization procedure. (See [STEERING ANGLE SENSOR INITIALIZATION PROCEDURE](#).)



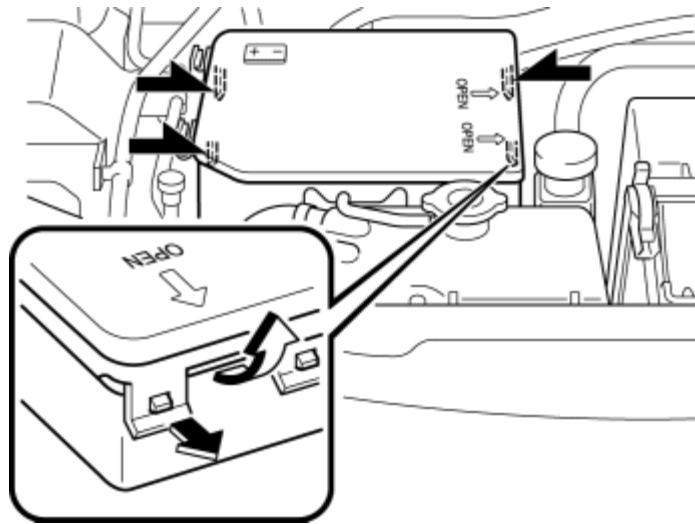
	(See <a href="#">Battery Cover Removal Note.</a> )
2	Negative battery cable (See <a href="#">Negative Battery Cable Installation Note.</a> )
3	Positive battery cable
4	Battery clamp
5	Battery
6	Battery box
7	Battery tray
8	Battery duct (See <a href="#">Battery Duct Removal Note.</a> )

## Battery Cover Removal Note

1. Remove the rubber hose from the battery cover.



2. Remove the battery cover from its right side.

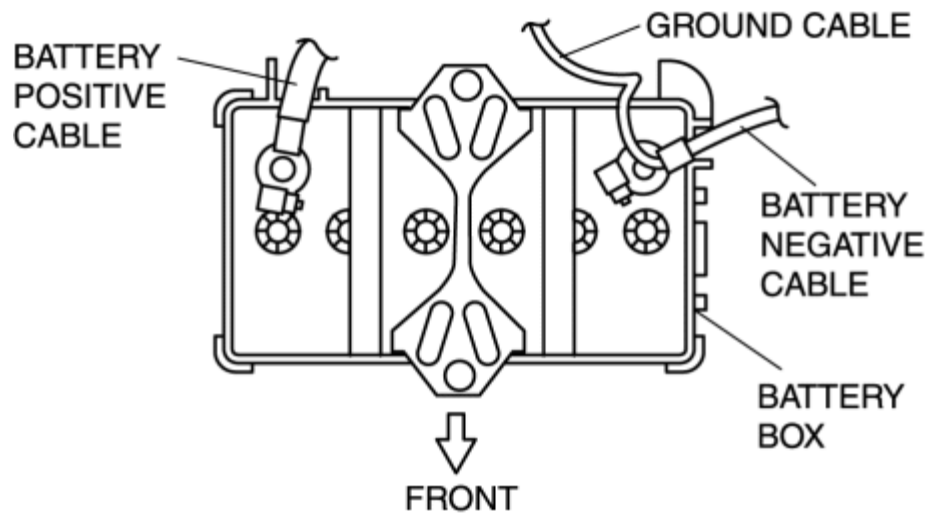


### Battery Duct Removal Note

1. Remove the under cover.
2. Remove the battery duct.

### Negative Battery Cable Installation Note

1. When connecting the negative battery cable to the battery, connect the negative battery cable and the ground cable as shown in the figure.



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BATTERY INSPECTION [LF]

WARNING:

- 1. Since battery acid is toxic, be careful when handling the battery.
- 2. Since battery acid is highly corrosive, be careful not to allow it to contact clothing or the vehicle.
- 3. In case battery acid contacts skin, eyes, or clothing, flush it immediately with running water. Especially if the acid gets in the eyes, flush with water for more than 15 min. and get prompt medical attention.

Electrolyte specific gravity

- 1. Measure the electrolyte specific gravity using a hydrometer.
  - If it is less than the specification, recharge the battery. (See **BATTERY RECHARGING [LF]**.)

Battery electrolyte specific gravity [20 °C {68 °F}]

- 1.22—1.29

Battery voltage

- 1. Inspect the battery as follows:

Step	Inspection		Action
1	Measure the battery positive voltage.	12.4 V or more	Go to Step 3.
		Less than 12.4 V	Go to the next step.
2	Quick charge for <b>30 min.</b> and recheck voltage.	12.4 V or more	Go to the next step.
		Less than	Replace the

		12.4 V	battery.
3	Using the battery load tester, apply load current (see battery load test current) and record battery voltage after <b>15 s</b> . Is voltage more than specification?	Yes	Normal
		No	Replace the battery.

### Battery load test current

- 46B24L (36): 135 A

### Standard specification

Battery temp. (°C {°F})	Minimum voltage (V)
4 {39}	9.3
10 {50}	9.4
16 {61}	9.5
21 {70}	9.6

### Parasitic Draw

1. Verify that the ignition is off (key has been removed) and that all doors are closed.
2. Remove the battery cover.
3. Disconnect the negative battery cable. (See **BATTERY REMOVAL/INSTALLATION [LF]**.)
4. Connect the tester between the negative battery terminal and negative battery cable, leave the battery undisturbed for **30 min.**, and then measure the parasitic draw.
  - If not within the specification, measure the parasitic draw while removing the fuses one by one from the inside of the main fuse block and the inside of the fuse block.

#### NOTE:

- If the battery is not left undisturbed for **30 min.**, the tester will indicate a high value (**approx. 300 mA**).
- If the key or any electrical accessory is operated within **approx. 30 min.** after the tester is connected, the battery must be left undisturbed for approx. 30 min. from that point.

#### CAUTION:

- Operating electrical loads while the parasitic draw is being measured can damage the tester.

**NOTE:**

- For vehicles with the immobilizer system, the system periodically shifts synchronization of the security light flashing. Therefore, **45 mA (0.1 s)** current is supplied when the security light is illuminated, and **25 mA (2 s)** current is supplied when the security light is not illuminated. In addition, the measuring instrument, which shows the average value, indicates around **30 mA**.

**Battery parasitic draw (When the ignition is off (key is removed), all doors and the hood are closed.)**

- Vehicles with immobilizer system: 25—45 mA
- Vehicles without immobilizer system: 30 mA or less

5. Inspect and repair wiring harnesses and connectors of the fuse where the current has decreased.

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## 2008 - MX-5 - Engine

### BATTERY RECHARGING [LF]

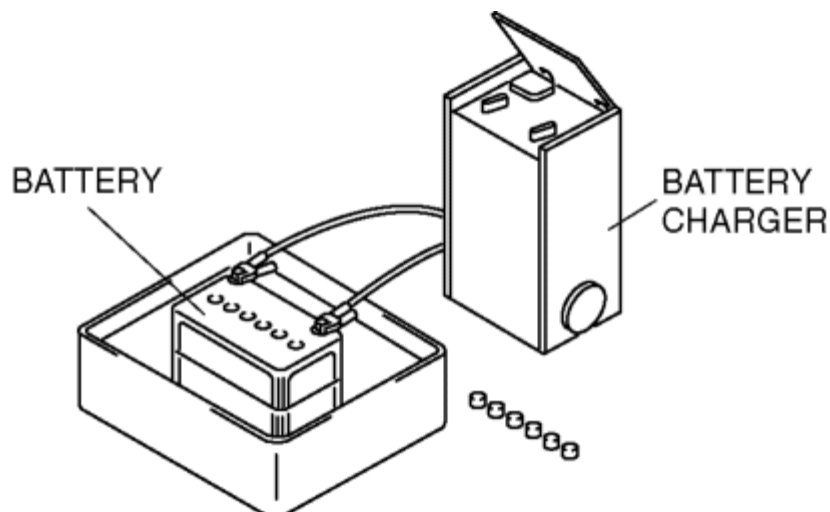
#### WARNING:

- Keep all flames away from the battery, otherwise evaporated gas from the battery fluid may catch fire, and cause serious injury.
- Remove the battery filler caps when recharging to prevent battery deformation or damage.

#### CAUTION:

- Do not quick charge for more than 30 min. It will damage the battery.

1. Remove the battery and then place it in a pan of water.



2. Connect a battery charger to the battery and adjust the charging current as follows.

#### **Battery slow charge current**

- 46B24L (36): 3.5—4.5 A

#### **Battery quick charge current [30 min.]**

- 46B24L (36): 25 A

3. After the battery is recharged, verify that the voltage is within the specification and remains at the same value for **1 h or more** after the recharging was completed.

- If not within the specification, replace the battery.

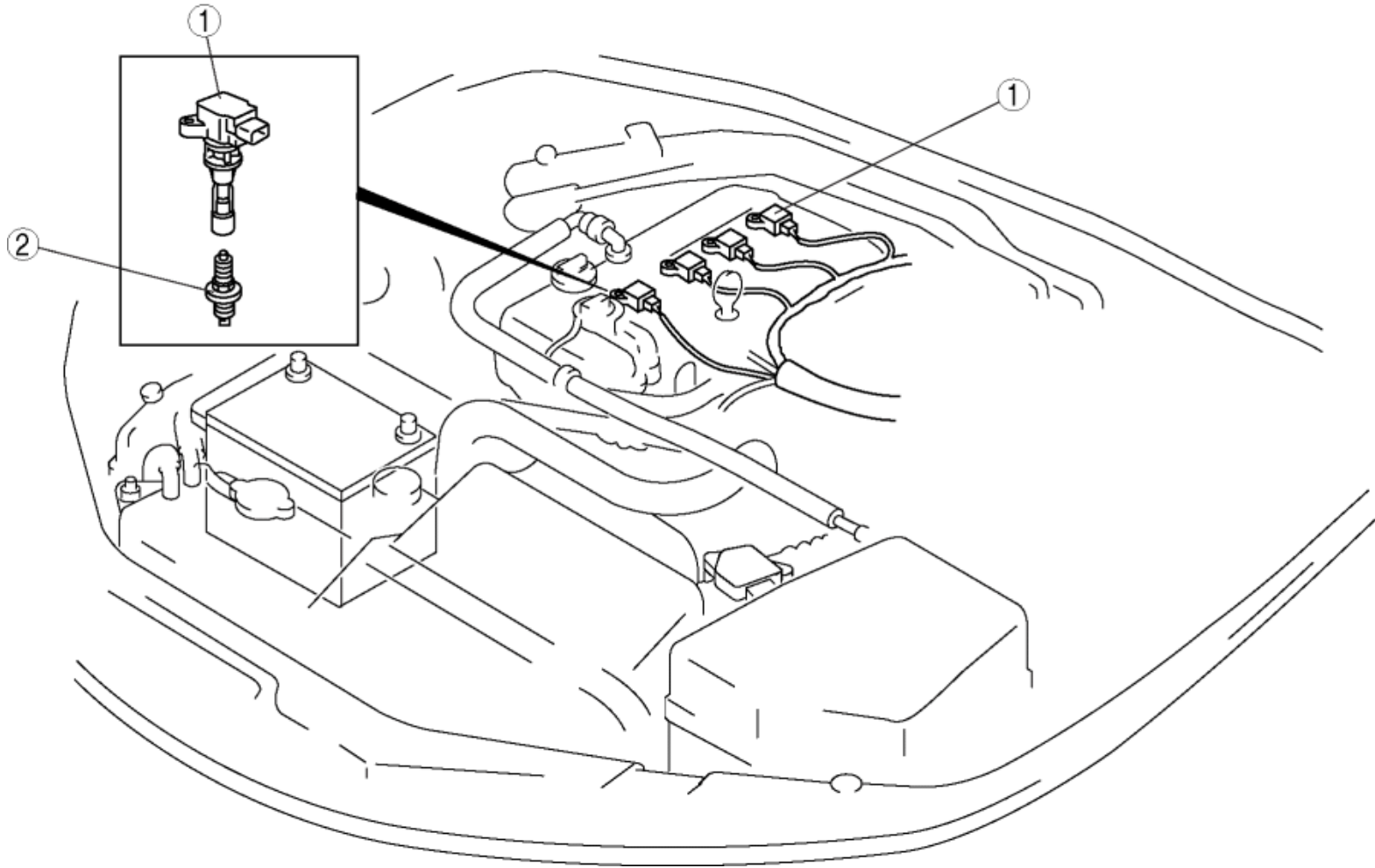
#### **Standard voltage**

- 12.4 V or more



## 2008 - MX-5 - Engine

### IGNITION SYSTEM LOCATION INDEX [LF]



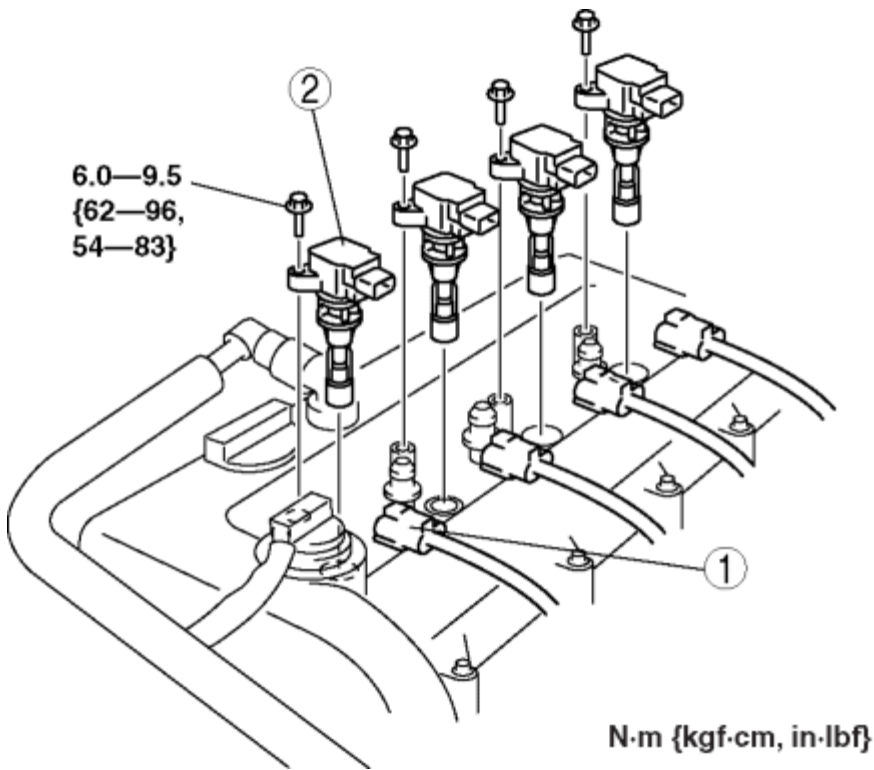
1 Ignition coil  
(See [IGNITION COIL REMOVAL/INSTALLATION \[LF\]](#).)  
(See [IGNITION COIL INSPECTION \[LF\]](#).)

2 Spark plug  
(See [SPARK PLUG REMOVAL/INSTALLATION \[LF\]](#).)  
(See [SPARK PLUG INSPECTION \[LF\]](#).)

2008 - MX-5 - Engine

IGNITION COIL REMOVAL/INSTALLATION [LF]

- 1. Remove the battery cover.
- 2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
- 3. Remove the plug hole plate. (See [PLUG HOLE PLATE REMOVAL/INSTALLATION \[LF\]](#).)
- 4. Remove the front suspension tower bar (joint). (See [FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION](#).)
- 5. Remove in the order indicated in the table.
- 6. Install in the reverse order of removal.



1	Connector
2	Ignition coil



## 2008 - MX-5 - Engine

### IGNITION COIL INSPECTION [LF]

#### Ignition Coil Inspection

1. Perform the spark test and identify the malfunctioning cylinder. (See [ENGINE CONTROL SYSTEM OPERATION INSPECTION \[LF\]](#).)
2. Replace the ignition coil of the malfunctioning cylinder with that of a normal cylinder, and reperform the spark test. (See [ENGINE CONTROL SYSTEM OPERATION INSPECTION \[LF\]](#).)
  - If the spark is not normal due to a malfunctioning ignition coil, replace that ignition coil.
  - It is unlikely that all four ignition coils fail to operate properly. To prevent replacing a normal component, perform the above procedure, identify the malfunctioning ignition coil, and replace it.

## 2008 - MX-5 - Engine

### SPARK PLUG REMOVAL/INSTALLATION [LF]

#### CAUTION:

- If a spark plug that is not as specified is installed, engine performance will be deteriorated. Install only the specified spark plug when replacing.

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the plug hole plate. (See [PLUG HOLE PLATE REMOVAL/INSTALLATION \[LF\]](#).)
4. Remove the front suspension tower bar (joint). (See [FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION](#).)
5. Remove the ignition coils. (See [IGNITION COIL REMOVAL/INSTALLATION \[LF\]](#).)
6. Remove the spark plugs using a plug-wrench.
7. Install in the reverse order of removal.

#### Tightening torque

- 10—14 N·m { 1.1—1.4 kgf·m, 8—10 ft·lbf }

## 2008 - MX-5 - Engine

### SPARK PLUG INSPECTION [LF]

#### Specification

##### Spark plug type

- L3G2 18 110, L3Y1 18 110

#### Plug Gap Inspection

##### CAUTION:

1. To avoid possible damage to the tip, do not adjust the plug gap.
1. To prevent damaging the tip, use a wire type plug gap gauge when inspecting the plug gap.
1. Measure the spark plug gap using a wire type plug gap gauge.
  1. If it exceeds the specification, replace the spark plug.

##### Spark plug gap

- 1.25—1.35 mm {0.050—0.053 in}

#### Cleaning

##### CAUTION:

1. Carbon may adhere to the tip of the spark plug during vehicle delivery or repeated short distance driving during the winter time. If there is any malfunction such as rough idling or start difficulty due to carbon adhesion causing plug fouling, burn off the carbon by performing no-load racing of the engine.
2. When performing the no-load racing, apply the side brake and foot brake, move the shift lever to neutral (MT), or the selector lever to P position (AT) to prevent an accident and serious injury.
3. To avoid possible damage to the spark plug tip, do not use a wire brush for cleaning.

##### NOTE:

1. To avoid possible damage to the tip, use gasoline to clean the spark plugs after removing dirt.
2. If the accelerator pedal is depressed continuously for a specified time, the engine speed

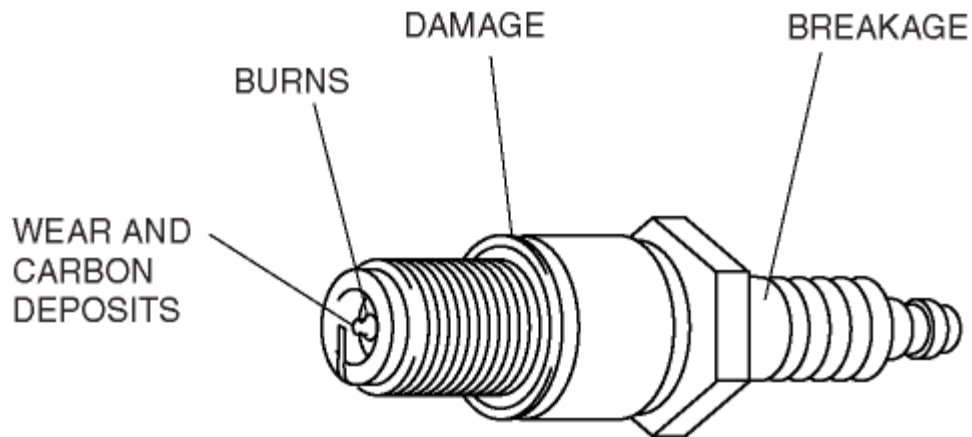


may decrease to the idle speed. This is due to the fuel cut control operation, which prevents overheating, and it does not indicate a malfunction.

3. Do not perform no-load racing at high engine speed continuously for **10 s or more**.
1. If there is carbon adhering to the spark plug, perform no-load racing at **4,000 rpm for 2 min, 2 times**.

### Visual inspection

1. Inspect the following items:



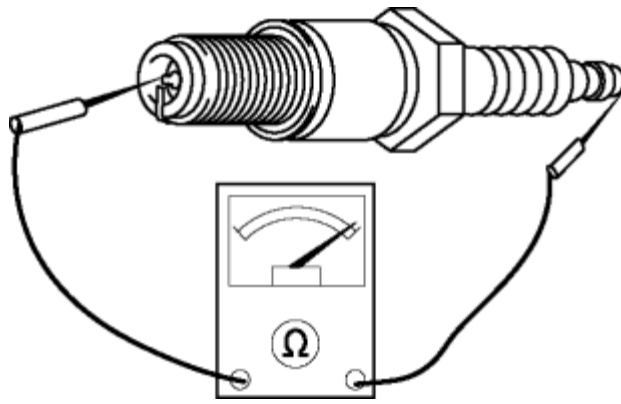
- If any of the following malfunction are indicated, replace the spark plug.
  - Insulator breakage
  - Worn electrode
  - Damaged gasket
  - Badly burned insulator (sparking side)

### Resistance Inspection

1. Measure the resistance of the spark plug using a tester as shown in the figure.
  - If not within the specification, replace the spark plug.

#### **Spark plug resistance [25 °C {77 °F}]**

- 3.0—7.5 kilohms



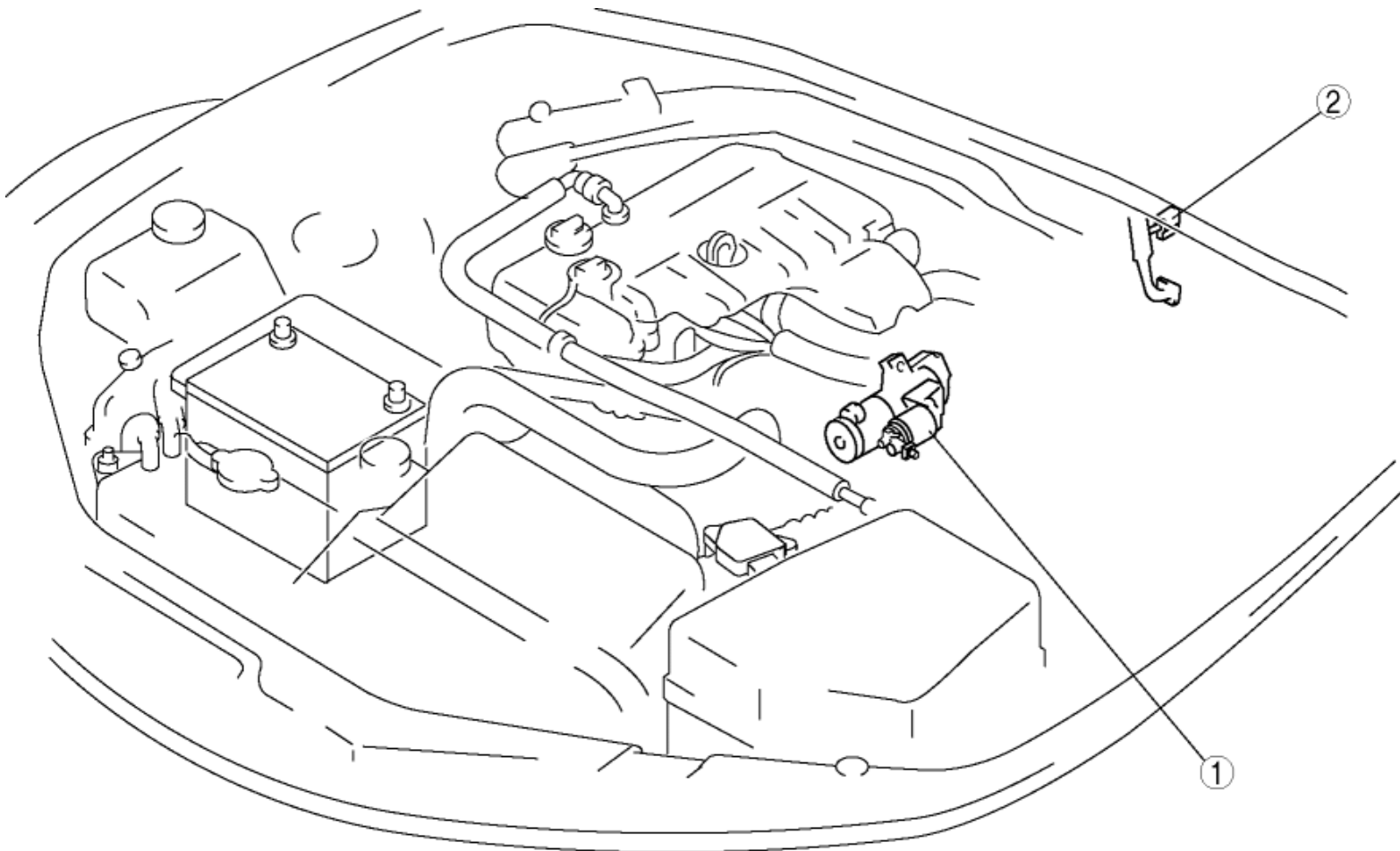
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## 2008 - MX-5 - Engine

### STARTING SYSTEM LOCATION INDEX [LF]



#### 1 Starter

(See [STARTER REMOVAL/INSTALLATION \[LF\]](#).)

(See [STARTER INSPECTION \[LF\]](#).)

(See [STARTER DISASSEMBLY/ASSEMBLY \[LF\]](#).)

#### 2 Starter interlock switch (MT)

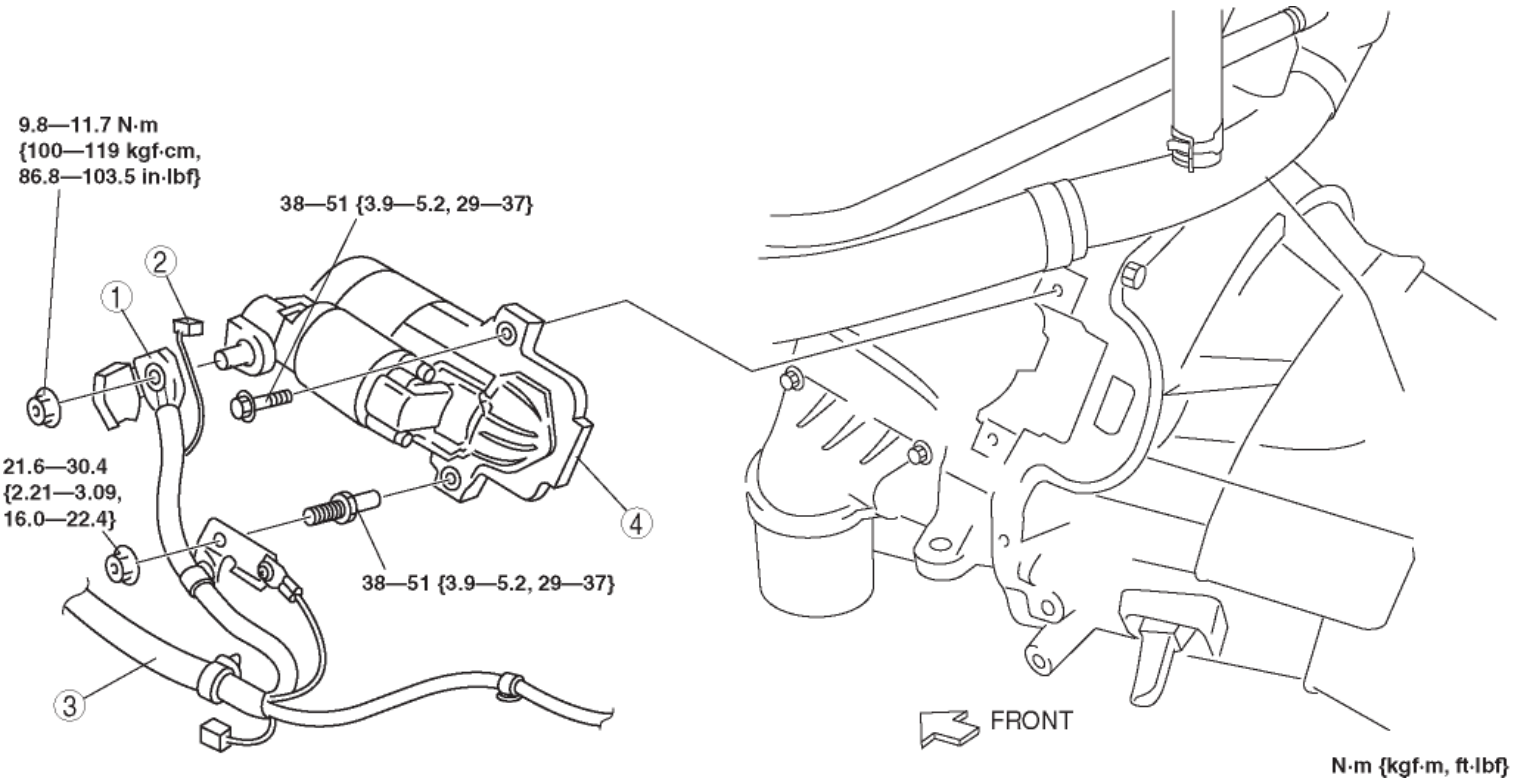
(See [STARTER INTERLOCK SWITCH INSPECTION \[LF\]](#).)

2008 - MX-5 - Engine

STARTER REMOVAL/INSTALLATION [LF]

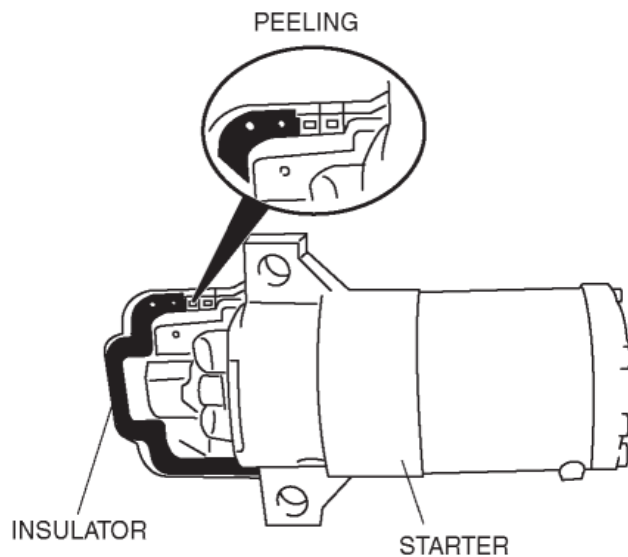
WARNING:

- Remove and install all parts when the engine is cold, otherwise they can cause severe burns or serious injury.
  - When the battery cables are connected, touching the vehicle body with starter terminal B will generate sparks. This can cause personal injury, fire, and damage to the electrical components. Always disconnect the negative battery cable before performing the following operation.
1. Remove the battery cover.
  2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
  3. Remove the side cover. (LH)
  4. Remove the under cover. (MT) (See [TRANSVERSE MEMBER REMOVAL/INSTALLATION](#).)
  5. Remove the clutch release cylinder with the pipes still connected. Position the clutch release cylinder so that it is out of the way. (MT) (See [TRANSMISSION REMOVAL/INSTALLATION \[M15M-D\]](#).) (See [TRANSMISSION REMOVAL/INSTALLATION \[P66M-D\]](#).)
  6. Remove the oil filter. (Vehicles with oil cooler) (See [OIL FILTER REPLACEMENT \[LF\]](#).)
  7. Remove the oil cooler and oil filter adapter component with the water hoses still connected. Position the oil cooler and oil filter adapter component so that it is out of the way. (Vehicles with oil cooler) (See [OIL COOLER REMOVAL/INSTALLATION \[LF\]](#).)
  8. Remove in the order indicated in the table.
  9. Install in the reverse order of removal.
  10. Inspect the oil level. (Vehicles with oil cooler) (See [ENGINE OIL LEVEL INSPECTION \[LF\]](#).)

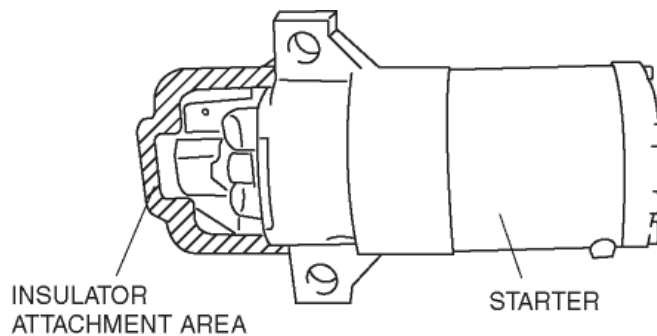


**Starter Installation Note****NOTE:**

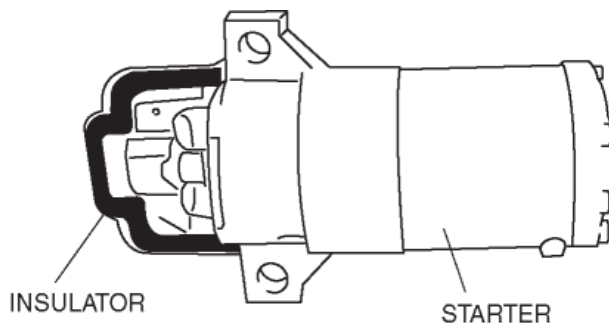
- If there is peeling on or damage to the insulator, attach a new insulator using the following procedure:



1. Peel off the insulator from the starter completely using a scraper.
2. Degrease the insulator attachment area.



3. Attach a new insulator to the starter.



## 2008 - MX-5 - Engine

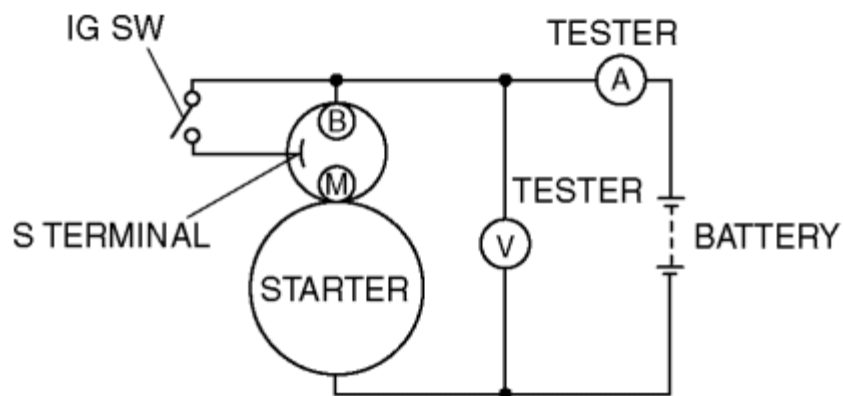
### STARTER INSPECTION [LF]

#### On-vehicle Inspection

1. Verify that the battery is fully charged.
2. The starter is normal if it rotates smoothly and without any noise when the engine is cranked.
  - If the starter does not operate, inspect the following:
    - Remove the starter, and inspect the starter unit.
    - Inspect the related wiring harnesses, the ignition switch, and the transmission range switch (AT).

#### No-load test

1. Verify that the battery is fully charged.
2. Connect the starter, battery, and a tester as shown in the figure.



3. Operate the starter and verify that it rotates smoothly.
  - If the starter does not rotate smoothly, inspect the starter unit.
4. Measure the voltage and current while the starter is operating.
  - If not within the specification, replace the starter.

#### **Starter no load test voltage**

- 11 V

#### **Starter no load test current**

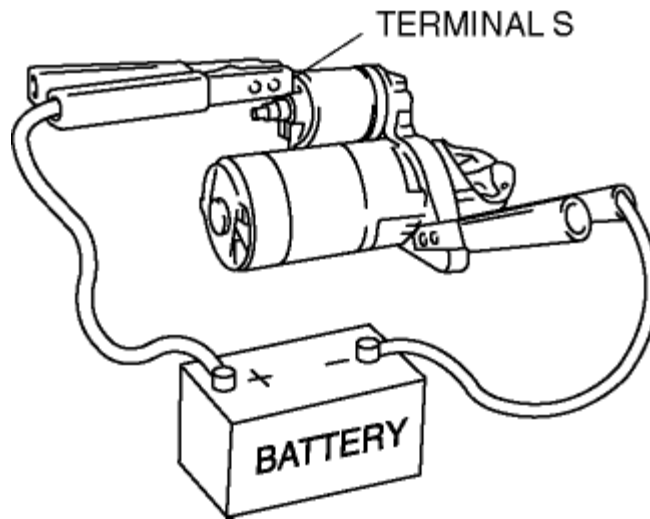
- 90 A or less

## Magnetic Switch Operation Inspection

### Pull out test

#### NOTE:

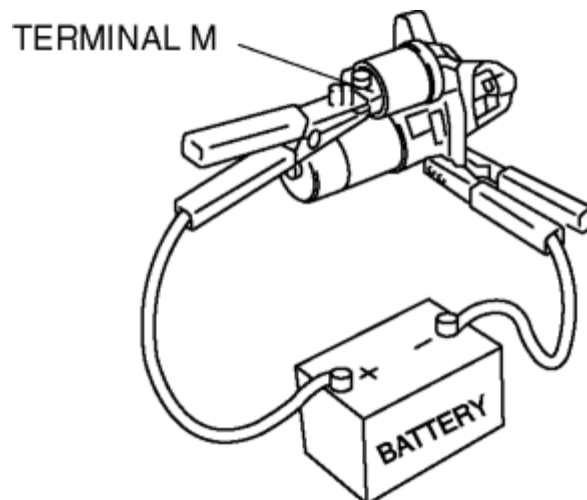
- Depending on the battery charge condition, the starter motor pinion may rotate while in an extended state. This is due to current flowing to the starter motor through the pull-in coil to turn the starter motor, and does not indicate an abnormality.
- Verify that the starter motor pinion is extended while battery positive voltage is connected to terminal S and the starter body is grounded.



- If the starter motor pinion is not extended, repair or replace the starter.

### Return test

- Disconnect the motor wire from terminal M.
- Connect battery positive voltage to terminal M and ground the starter body.

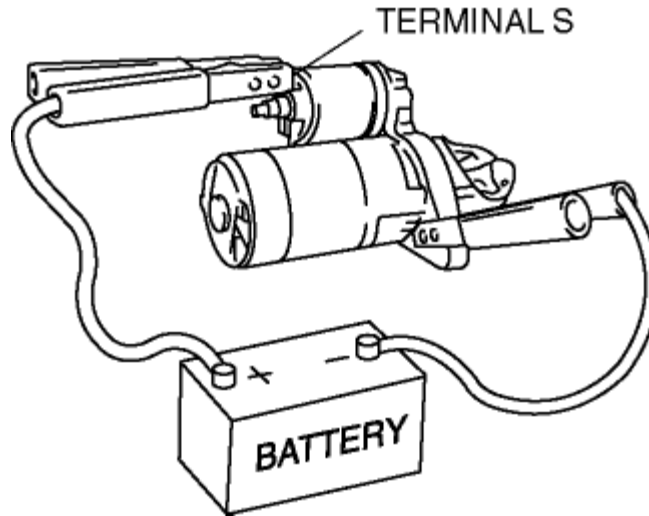


3. Pull out the drive pinion with a screwdriver. Verify that it returns to its original position when released.

- If it does not return, repair or replace the starter.

## Pinion Gap Inspection

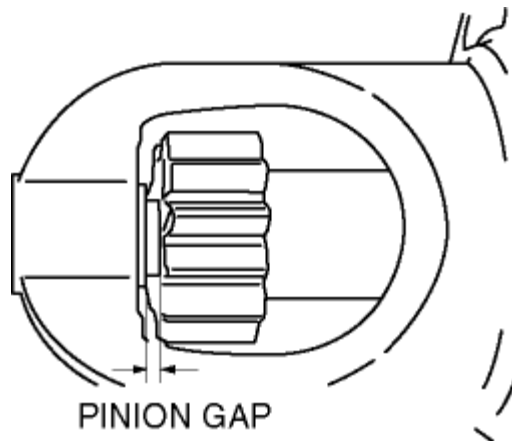
1. Pull out the drive pinion with the battery positive voltage connected to terminal S and the starter body grounded.



### CAUTION:

- Applying power for more than 10 s can damage the starter. Do not apply power for more than 10 s.

2. Measure the pinion gap while the drive pinion is extended.



- If not as specified, adjust with an adjustment washer (between drive housing front cover and magnetic switch).

### Starter pinion gap

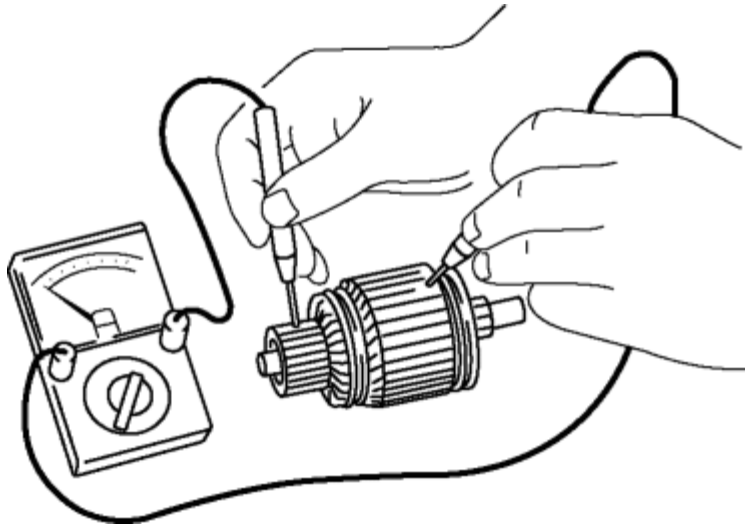
- 0.5—2.0 mm {0.02—0.07 in}

## Starter Inner Parts Inspection



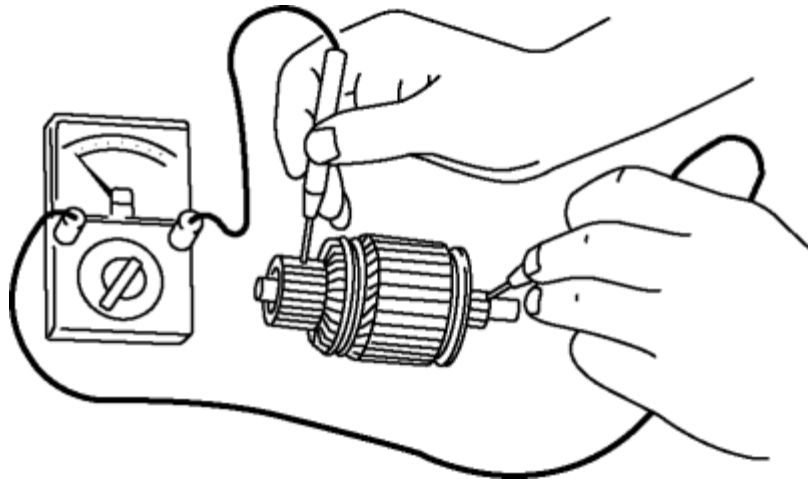
## Armature

1. Verify that there is no continuity between the commutator and the core at each segment using a tester.



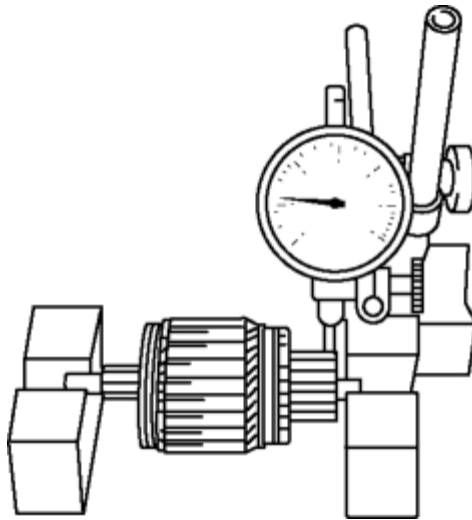
- If there is continuity, replace the armature.

2. Verify that there is no continuity between the commutator and the shaft using a tester.



- If there is continuity, replace the armature.

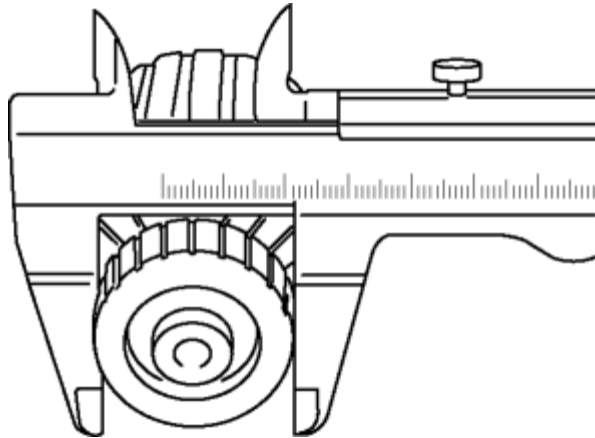
3. Place the armature on V blocks, and measure the runout using a dial indicator.



### **Starter armature runout**

- 0.1 mm {0.004 in} max.

4. Measure the commutator diameter.

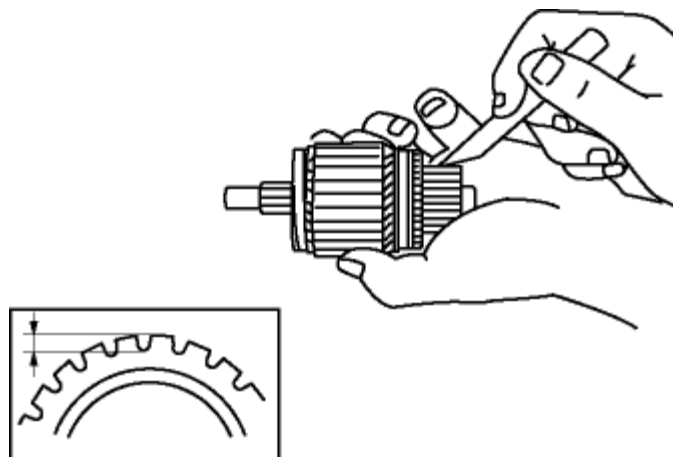


- If not within the minimum specification, replace the armature.

### **Starter commutator diameter**

- Standard: 29.4 mm {1.16 in}
- Minimum: 28.8 mm {1.13 in}

5. Measure the segment groove depth of the commutator.



- If not within the minimum specification, undercut the grooves to the standard depth.

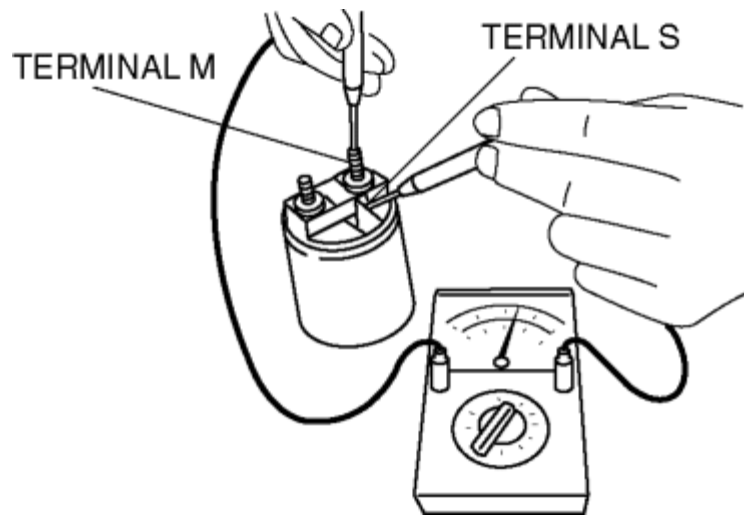
### **Segment groove depth of starter commutator**

- Standard: 0.5 mm {0.02 in}
- Minimum: 0.2 mm {0.008 in}

### **Magnetic switch**

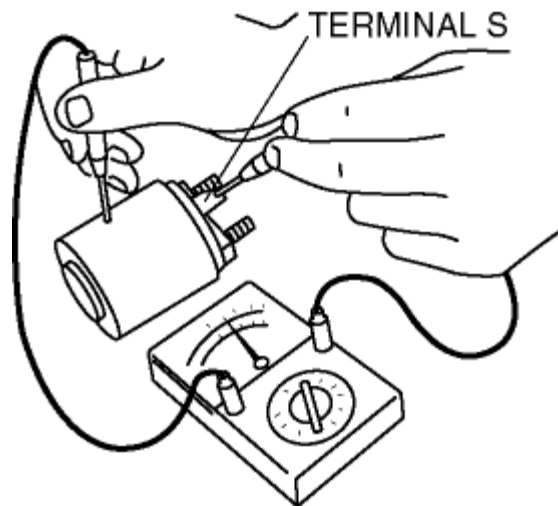
1. Inspect for continuity between terminals S and M using a tester.

- If there is no continuity, replace the magnetic switch.



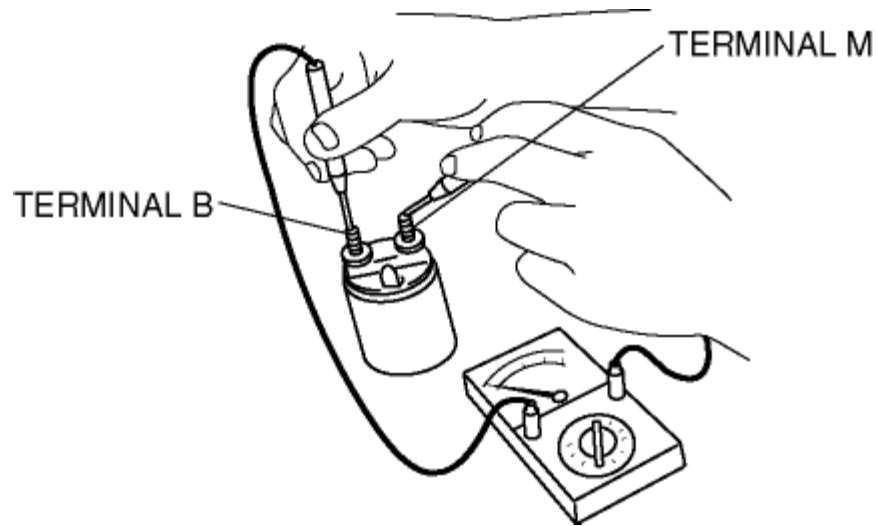
2. Inspect for continuity between terminal S and the body using a tester.

- If there is no continuity, replace the magnetic switch.



3. Verify that there is no continuity between terminals M and B using a tester.

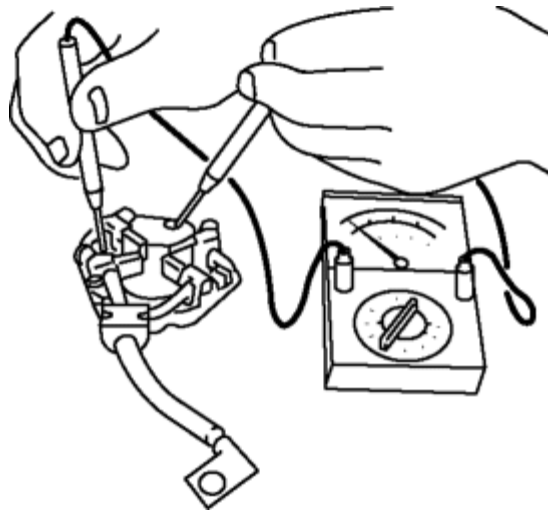
- If there is continuity, replace the magnetic switch.



### Brush and brush holder

1. Verify that there is no continuity between each insulated brush and plate using a tester.

- If there is continuity, replace the brush holder.

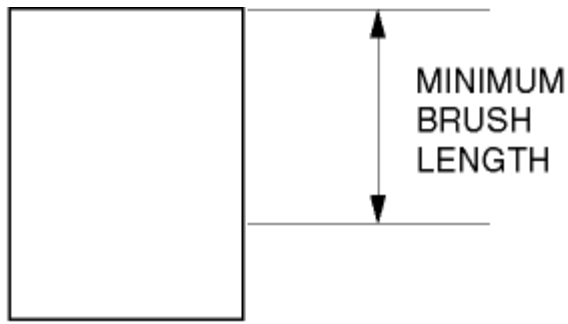


2. Measure the brush length.

- If any brush is worn almost to or beyond the minimum specification, replace all of the brushes.

### Starter brush length

- Standard: 12.3 mm {0.48 in}
- Minimum: 5.5 mm {0.22 in}



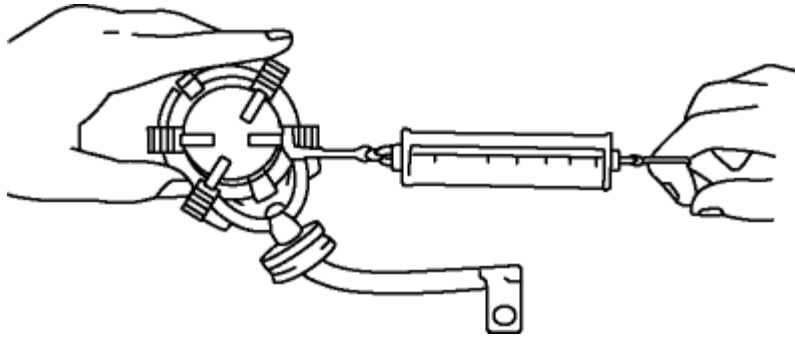
### CONTACT FACE WITH COMMUTATOR

3. Measure the brush spring force using a spring balance.

- If not within the minimum specification, replace the brush and brush holder component.

#### **Starter brush spring force**

- Standard: 15.0—20.4 N {1.53—2.08 kgf, 3.38—4.58 lbf}
- Minimum: 2.75 N {0.28 kgf, 0.62 lbf}



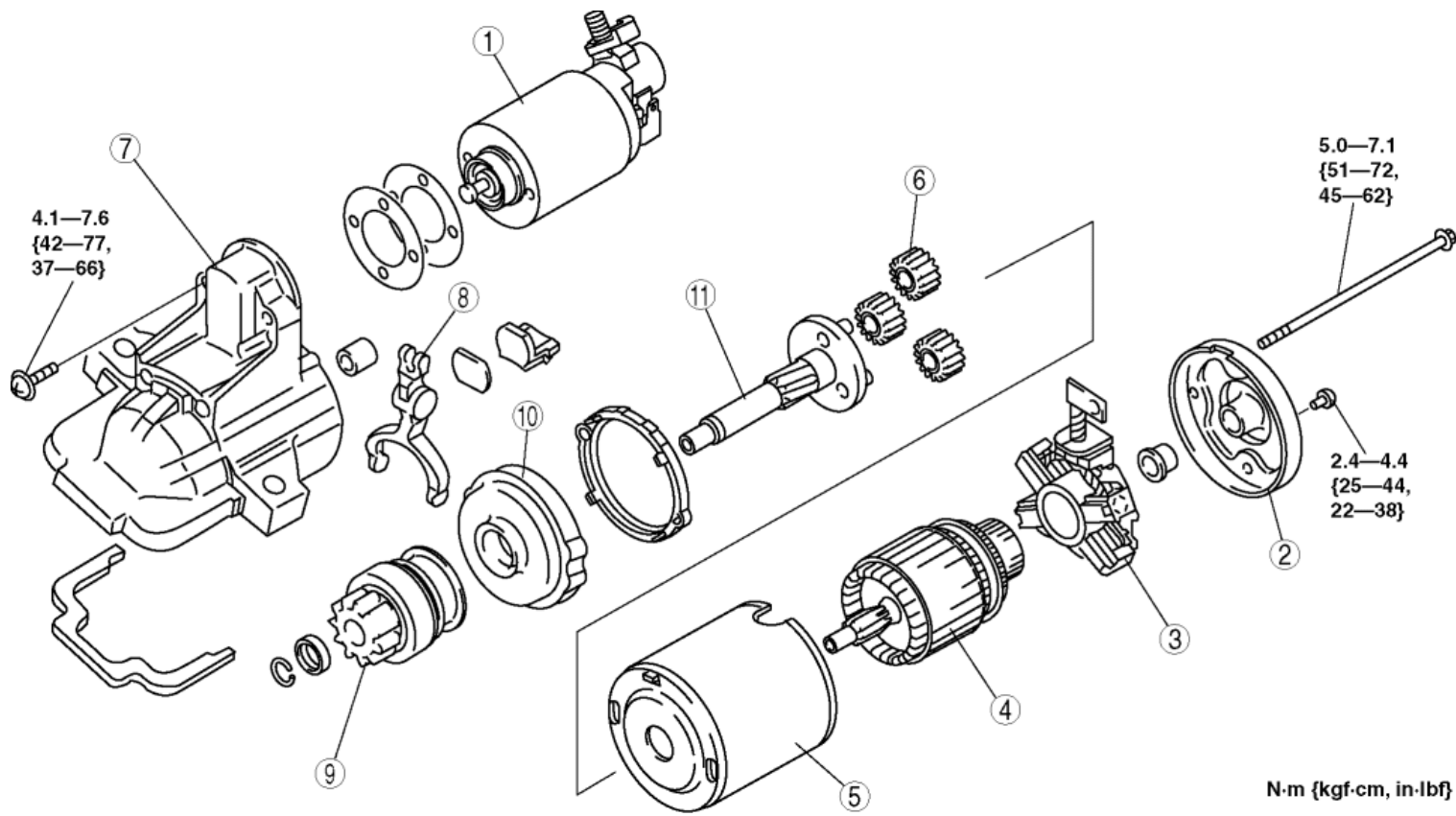
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STARTER DISASSEMBLY/ASSEMBLY [LF]

- 1. Disassemble in the order indicated in the table.
- 2. Assemble in the reverse order of disassembly.



N·m {kgf·cm, in·lbf}

1	Magnetic switch
2	Rear housing
3	Brush and brush holder
4	Armature
5	Yoke
6	Planetary gear
7	Front cover
8	Lever
9	Drive pinion
10	Internal gear
11	Gear shaft



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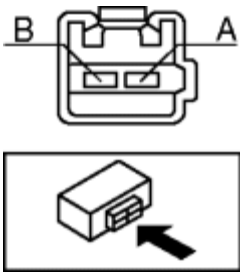
STARTER INTERLOCK SWITCH INSPECTION [LF]

CAUTION:

1. Do not reuse the starter interlock switch if it is removed from the vehicle even once.  
Replace with a new starter interlock switch when installing.
1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Disconnect the starter interlock switch connector.
4. Verify that the continuity is as indicated in the table using a tester.
  - If the continuity is not as indicated in the table, replace the starter interlock switch.

○—○ : Continuity

Condition	Terminal	
	A	B
Clutch pedal is depressed	○—	—○
Clutch pedal is not depressed		

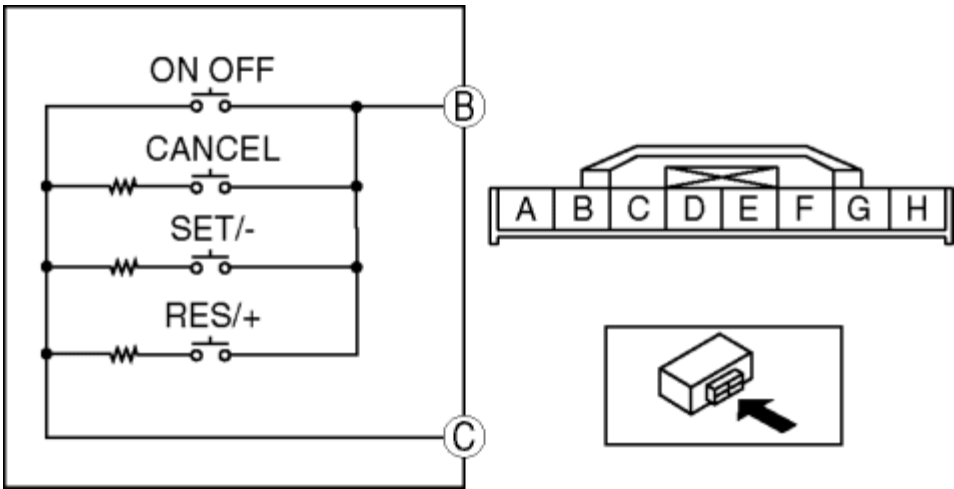




2008 - MX-5 - Engine

CRUISE CONTROL SWITCH INSPECTION [LF]

- 1. Disconnect the negative battery cable.
- 2. Remove the driver side air bag module. (See [DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.](#))
- 3. Disconnect the audio control switch connector. (See [AUDIO CONTROL SWITCH REMOVAL/INSTALLATION.](#))
- 4. Inspect for resistance and continuity between cruise control switch terminals B—C using a tester.



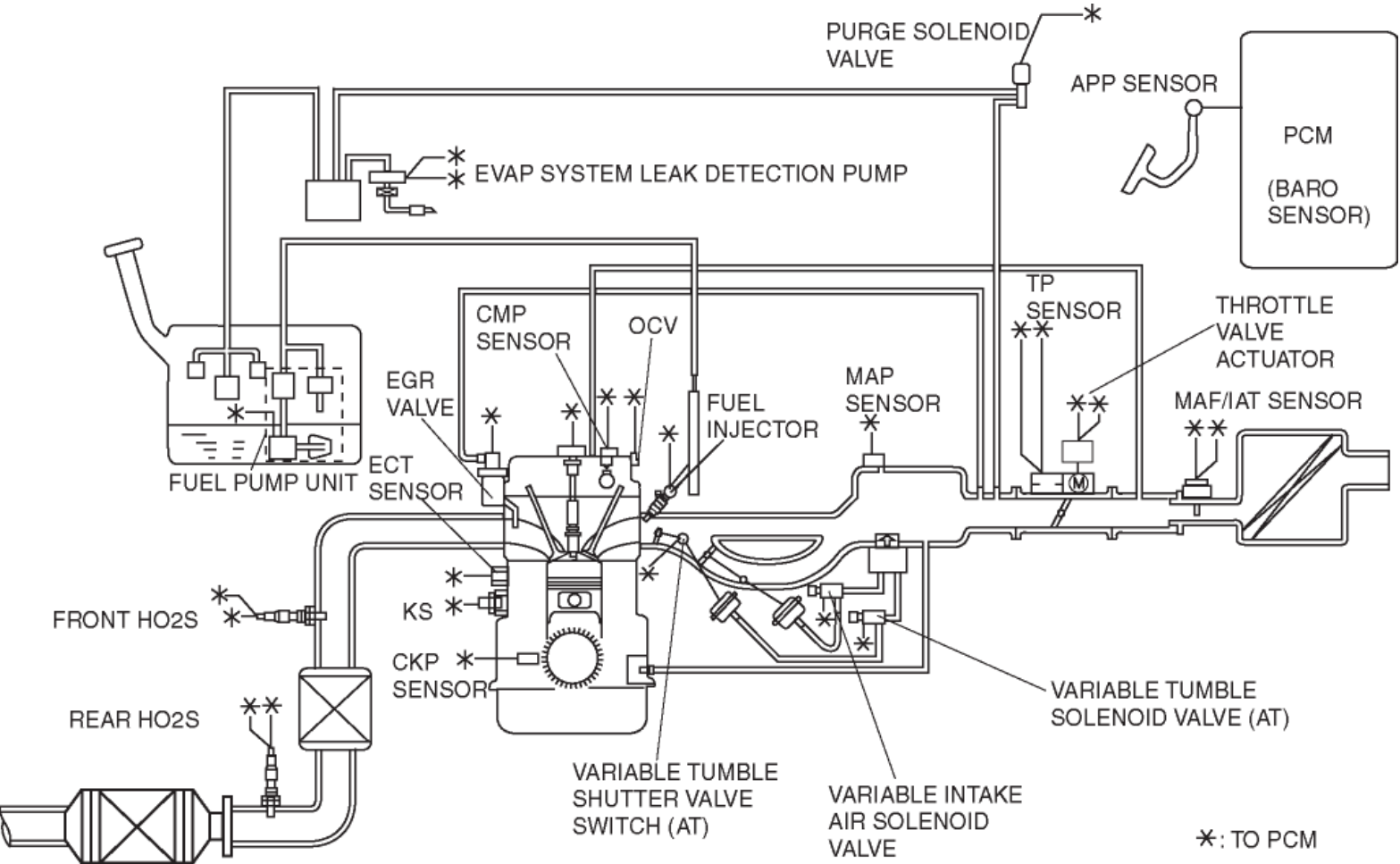
- If not as specified, replace the cruise control switch. (See [AUDIO CONTROL SWITCH REMOVAL/INSTALLATION.](#))

Switch condition	Resistance (ohm)
ON OFF button pressed	Continuity
CANCEL button pressed	117—123
SET/- button pressed	666—694
RES/+ button pressed	2,156—2,244
No button pressed	No continuity

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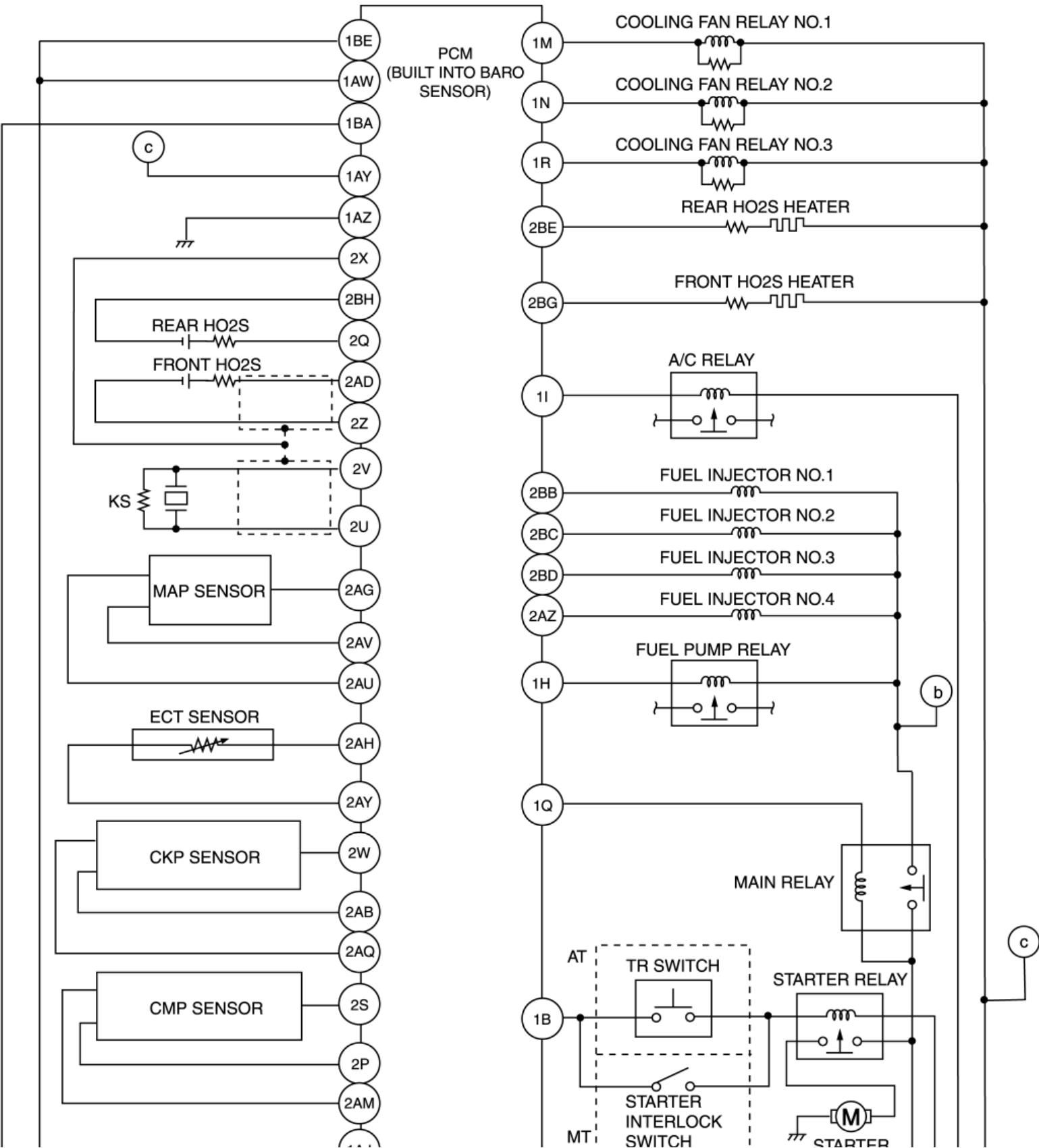
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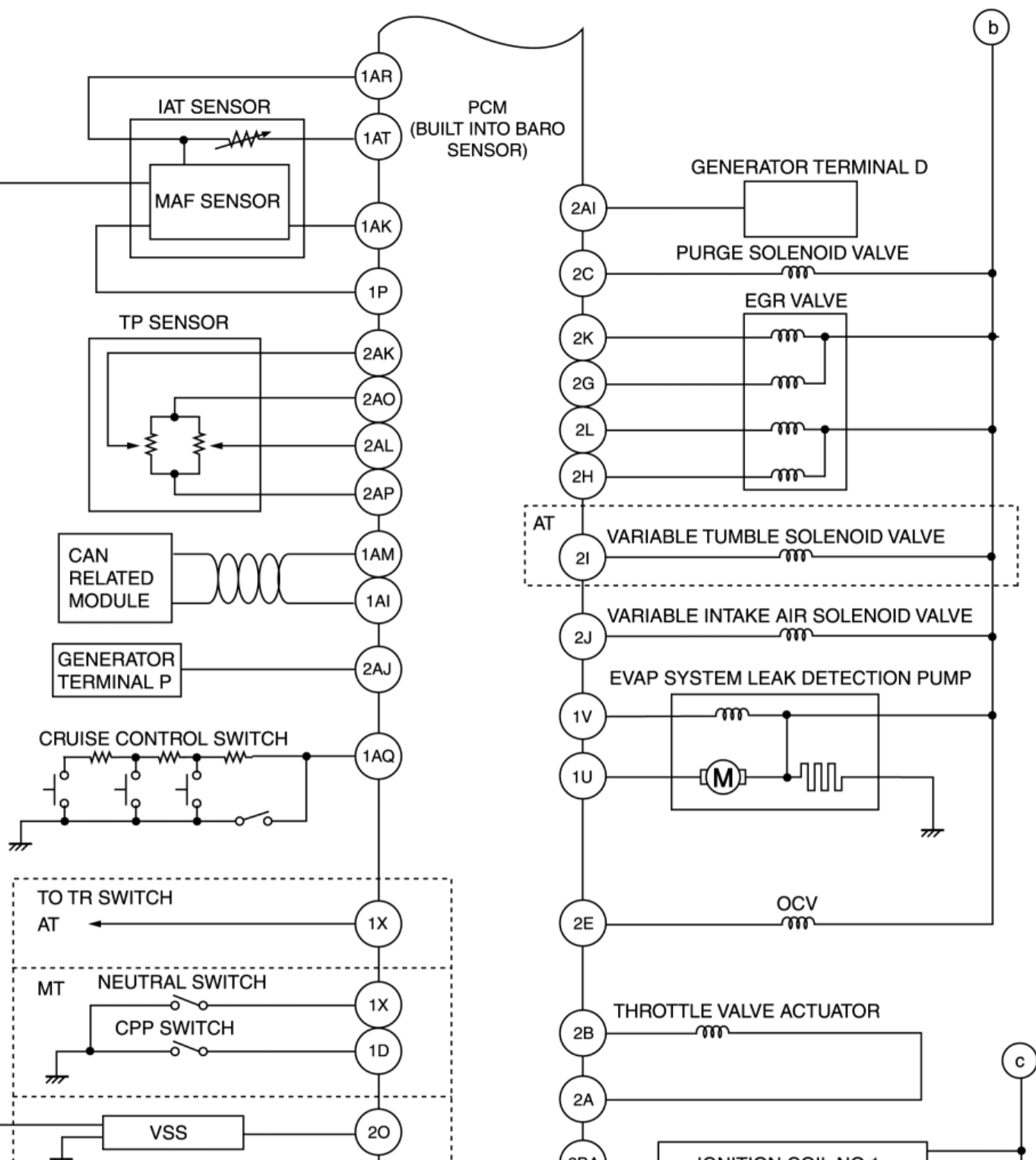
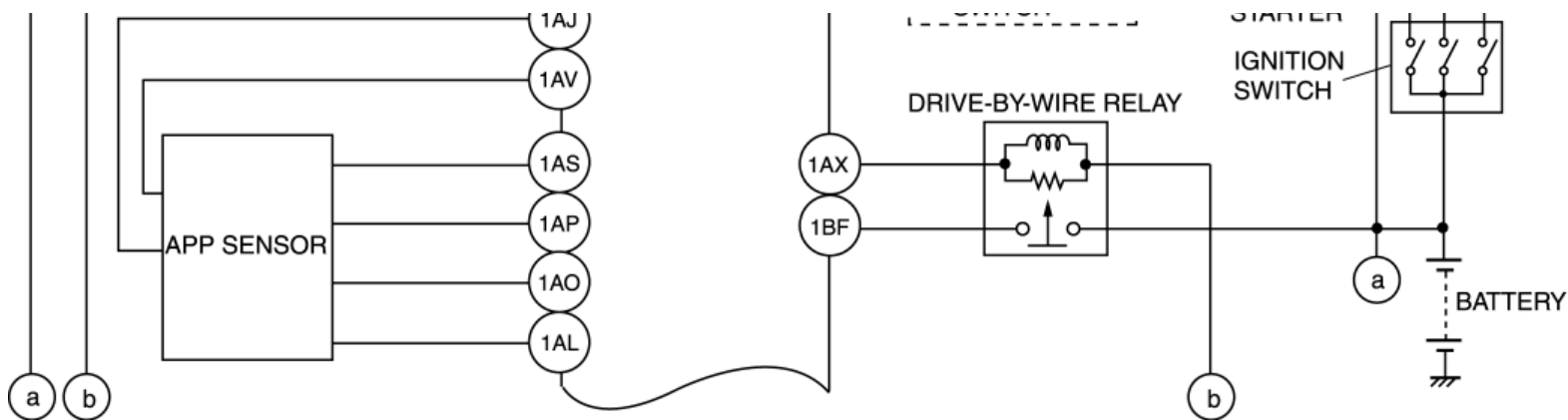
CONTROL SYSTEM DIAGRAM [LF]

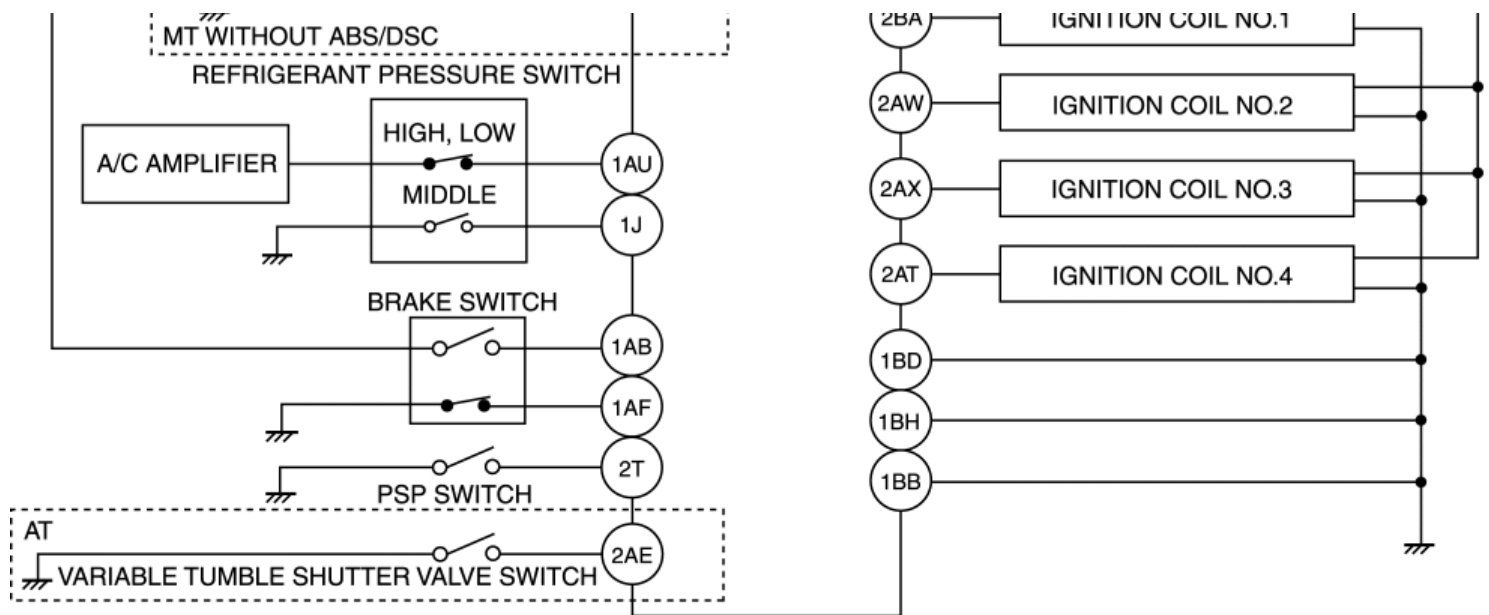


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CONTROL SYSTEM WIRING DIAGRAM [LF]







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## 2008 - MX-5 - Engine

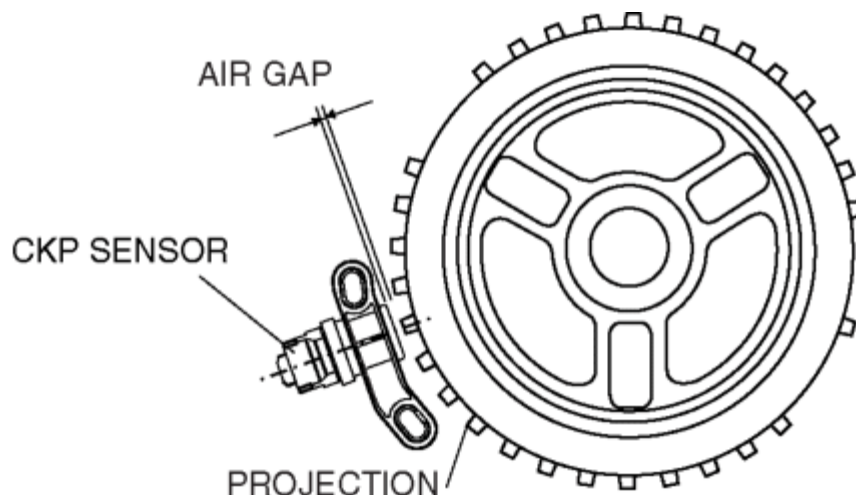
### CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [LF]

#### NOTE:

- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See [HOW TO USE THIS MANUAL](#).)

#### Air Gap Inspection

1. Verify that the CKP sensor is securely installed.
2. Using a thickness gauge, measure the air gap between the plate projections at the back of crankshaft pulley and the CKP sensor.



- If not within the specification, inspect the plate projections for cracks or bending.
  - If there is any malfunction, replace the crankshaft pulley. (See [ENGINE REMOVAL/INSTALLATION \[LF\]](#).)
  - If the monitor item condition/specification (reference) is not within the specification, even though there is no malfunction, carry out the "Circuit Open/Short Inspection".

#### Air gap

- 0.5—1.5 mm {0.02—0.05 in}

#### Visual inspection

1. Remove the battery cover.

- 2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
- 3. Remove the CKP sensor. (See [CRANKSHAFT POSITION \(CKP\) SENSOR REMOVAL/INSTALLATION \[LF\]](#).)
- 4. Verify that there are no metal shavings on the sensor.
  - If the monitor item condition/specification (reference) is without the specification even though there is no malfunction, carry out the “Circuit Open/Short Inspection”.

**Voltage Inspection**

- 1. Install all removed parts.
- 2. Idle the engine.

**CAUTION:**

- Water penetrating the connector will cause sensor malfunction. To prevent this, be careful not to damage the wiring harnesses or the waterproof connector so as to cause water penetration.
- 3. Measure the output voltage using an oscilloscope.



- If not within the specification, replace the CKP sensor. (See [CRANKSHAFT POSITION \(CKP\) SENSOR REMOVAL/INSTALLATION \[LF\]](#).)
- If the monitor item condition/specification (reference) is without the specification, even though the voltage is within the specification, carry out the “Circuit Open/Short Inspection”.

**Voltage**

Terminal	Voltage (V)	Condition
C	B+	Under any condition
B	4.8 or more	High output*
	0.8 or less	Low output*



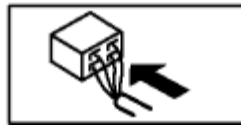
A	0	Under any condition
---	---	---------------------

\*

**Output voltage varies with crankshaft rotation.**

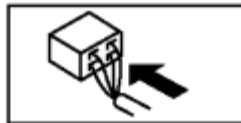
## Circuit Open/Short Inspection

### CKP SENSOR WIRING HARNESS SIDE CONNECTOR



### PCM WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



1. Disconnect the PCM connector. (See [PCM REMOVAL/INSTALLATION \[LF\]](#).)
2. Inspect the following wiring harnesses for an open or short circuit. (Continuity Inspection)

### Open circuit

- If there is no continuity, the circuit is open. Repair or replace the wiring harness.
  - CKP sensor terminal A and PCM terminal 2AB
  - CKP sensor terminal B and PCM terminal 2W
  - CKP sensor terminal C and PCM terminal 2AQ

### Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the wiring harness.
  - CKP sensor terminal A and power supply
  - CKP sensor terminal B and power supply
  - CKP sensor terminal B and body ground
  - CKP sensor terminal C and body ground

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## 2008 - MX-5 - Engine

### CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION [LF]

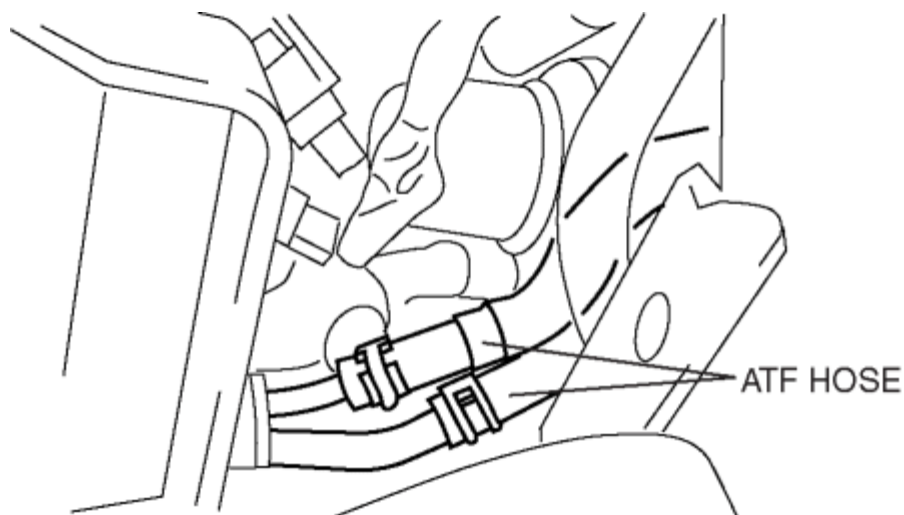
#### Removal

1. Remove the battery and battery tray. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
2. Remove the air cleaner. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the drive belt. (See [DRIVE BELT REPLACEMENT \[LF\]](#).)
4. Remove the under cover. (See [TRANSVERSE MEMBER REMOVAL/INSTALLATION](#).)
5. Disconnect the CKP sensor connector.
6. Remove the installation bolts to remove the CKP sensor.

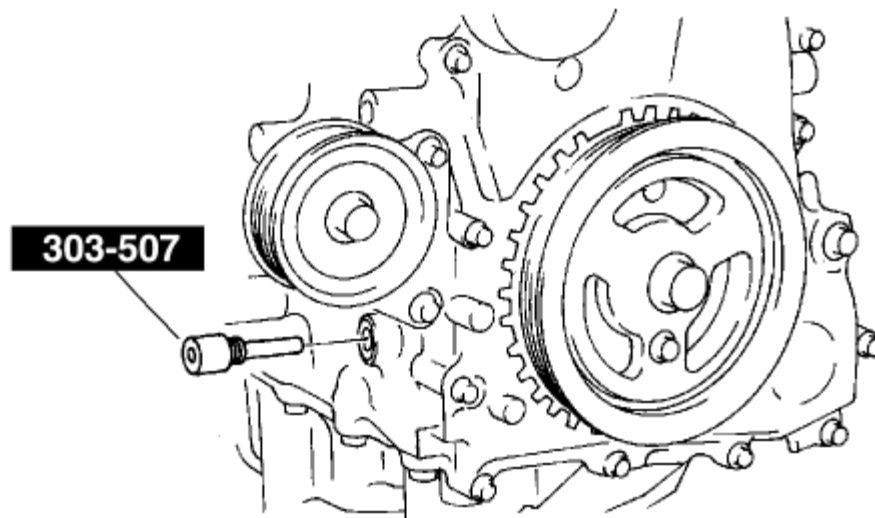
#### Installation

##### CAUTION:

- When foreign material, such as an iron chips, gets on the CKP sensor, it can cause abnormal output from the sensor because of flux turbulence and adversely affect engine control. Be sure there is no foreign material on the CKP sensor when replacing.
1. Perform the following procedure so that piston No.1 is at the top dead center.
    - a. Move the ATF hose slightly out of the way. (AT)

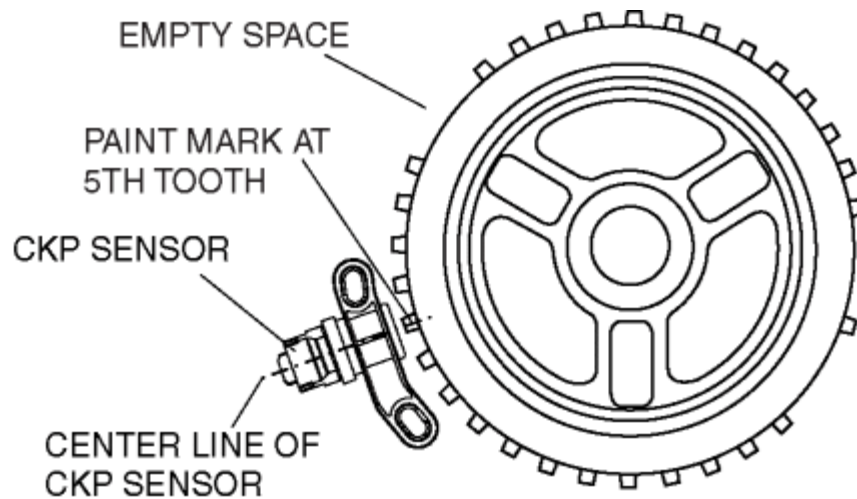


- b. Remove the cylinder block lower blind plug and install the **SST**.



c. Turn the crankshaft pulley to the clockwise until it stops.

2. Using a straight edge, draw a straight line directly in the center of the 5th tooth of the crankshaft pulley pulse wheel (counting counterclockwise from the empty space).



#### CAUTION:

- If the line is not accurately drawn, ignition timing, fuel injection and other engine control systems will be adversely effected. Draw the straight line carefully using a straight edge.

3. Align the center line of the CKP sensor and the line drawn in Step 2, then install the CKP sensor.

4. Install the CKP sensor fitting bolts.

#### Tightening torque

- 5.5—7.5 N·m {56—76 kgf·cm, 49—66 in·lbf}

5. Remove the **SST** then install the cylinder block lower blind plug.

#### Tightening torque

- 18—22 N·m {1.9—2.2 kgf·m, 14—16 ft·lbf}

6. Install in the reverse order of removal.

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## 2008 - MX-5 - Engine

### MASS AIR FLOW (MAF) SENSOR INSPECTION [LF]

#### NOTE:

- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See [HOW TO USE THIS MANUAL](#).)

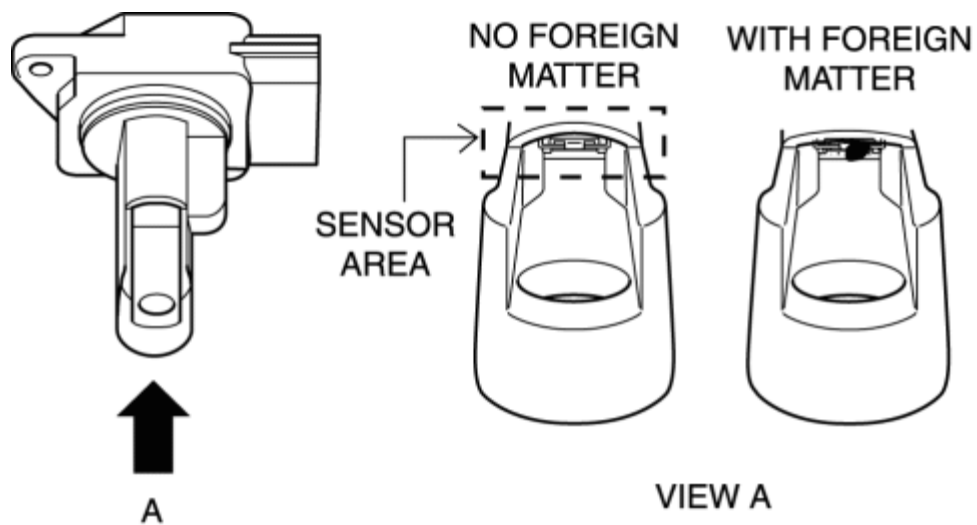
1. Verify the connection condition of the MAF sensor/IAT sensor connector.
  - If a connector has poor contact, install it correctly and then go to the next step.
  - If the connector connection is normal, go to the next step.
2. Verify the MAF sensor voltage under no airflow conditions using the following procedure:
  - Connect the M-MDS to the DLC-2.

#### CAUTION:

- Do not create suction in the exhaust pipe by cranking the engine and causing air to flow through the exhaust duct. It could cause a measurement error because the MAF sensor voltage is measured under no airflow conditions.
- Turn the ignition switch to the ON position and wait for 30 s.
- Verify that the MAF/IAT sensor output voltage (PID: MAF).

#### Specification

- 0.68 V
  - If it is the specification or more, replace the MAF/IAT sensor. (See [MASS AIR FLOW \(MAF\)/INTAKE AIR TEMPERATURE \(IAT\) SENSOR REMOVAL/INSTALLATION \[LF\]](#).)
  - If it is less than the specification, go to the next step.
3. Remove the MAF/IAT sensor. (See [MASS AIR FLOW \(MAF\)/INTAKE AIR TEMPERATURE \(IAT\) SENSOR REMOVAL/INSTALLATION \[LF\]](#).)
  4. Verify that there is no foreign matter in the MAF/IAT sensor.
    - Shine light on the sensor (Direction A in figure below) in the flow path and verify visually.
      - If there is visible, large foreign matter, replace the MAF/IAT sensor. (See [MASS AIR FLOW \(MAF\)/INTAKE AIR TEMPERATURE \(IAT\) SENSOR REMOVAL/INSTALLATION \[LF\]](#).)
      - If there is no foreign matter, go to the next step.



5. Verify that there is no damage, cracks, or dirt on the MAF sensor part of the MAD/IAT sensor.

- If a malfunction can be verified, repair or replace the MAF/IAT sensor. (See [MASS AIR FLOW \(MAF\)/INTAKE AIR TEMPERATURE \(IAT\) SENSOR REMOVAL/INSTALLATION \[LF\]](#).)
- If a malfunction cannot be verified, go to the next step (MAF sensor is normal).

**NOTE:**

- Install the removed MAF/IAT sensor because the MAF sensor is normal.

6. Install the MAF/IAT sensor. (See [MASS AIR FLOW \(MAF\)/INTAKE AIR TEMPERATURE \(IAT\) SENSOR REMOVAL/INSTALLATION \[LF\]](#).)

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2008 - MX-5 - Engine

NEUTRAL SWITCH INSPECTION [LF]

NOTE:

- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See [HOW TO USE THIS MANUAL](#).)

Continuity Inspection

1. Remove the neutral switch. (See [NEUTRAL SWITCH REMOVAL/INSTALLATION \[M15M-D\]](#).)

(See [NEUTRAL SWITCH REMOVAL/INSTALLATION \[P66M-D\]](#).)

2. Verify that the continuity between neutral switch terminals 1A and 2A is as indicated in the table.

- If not as indicated in the table, replace the neutral switch. (See [NEUTRAL SWITCH REMOVAL/INSTALLATION \[M15M-D\]](#).)(See [NEUTRAL SWITCH REMOVAL/INSTALLATION \[P66M-D\]](#).)
- If the monitor item condition/specification (reference) is not within the specification, even though there is no malfunction, perform the "Circuit Open/Short Inspection".

○—○ : Continuity

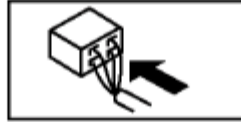
Condition	Terminal	
	1A	2A
Rod pushed	○—	—○
Normal condition		

Circuit Open/Short Inspection

1. Disconnect the PCM connector. (See [PCM REMOVAL/INSTALLATION \[LF\]](#).)
2. Inspect the following wiring harness for open or short circuit (continuity Inspection).

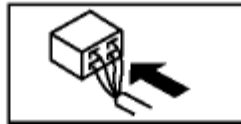


## NEUTRAL SWITCH WIRING HARNESS-SIDE CONNECTOR



## PCM WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



### Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - Neutral switch terminal 2A and PCM terminal 1X
  - Neutral switch terminal 1A and body ground

### Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - Neutral switch terminal 2A and body ground

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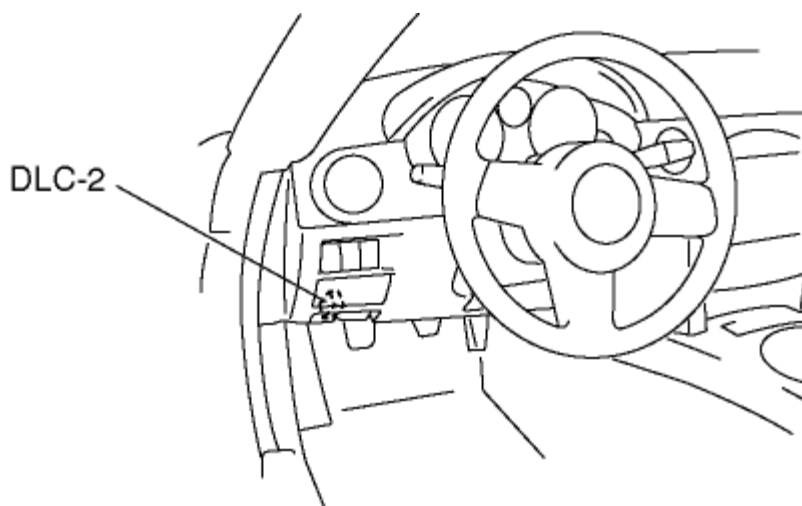
## 2008 - MX-5 - Engine

### MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR INSPECTION [LF]

#### NOTE:

- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See [HOW TO USE THIS MANUAL](#).)

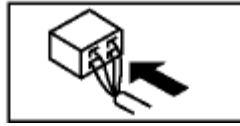
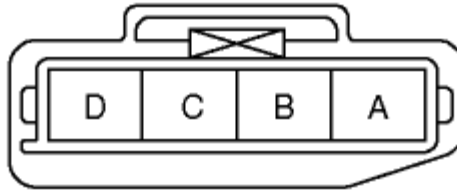
1. Connect the M-MDS to the DLC 2.



2. Turn the ignition switch to the ON position (Engine off).
3. Select MAP PID on the M-MDS.
4. Verify that the MAP PID (pressure) and barometric pressure are practically equal.
  - If not as verified, perform the "Circuit Open/Short Inspection".
    - If there is no open or short circuit, replace the MAP sensor. (See [MANIFOLD ABSOLUTE PRESSURE \(MAP\) SENSOR REMOVAL/INSTALLATION \[LF\]](#).)
  - If as verified, go to next step.
5. Apply vacuum of **-25.0 kPa {-187 mmHg, -7.38 inHg}** to the MAP sensor, and verify that the MAP variation from that of Step 4 is **approx. 25.0 kPa {187 mmHg, 7.38 inHg}**.
  - If not as verified, perform the "Circuit Open/Short inspection".
    - If there is no open or short circuit, replace the MAP sensor. (See [MANIFOLD ABSOLUTE PRESSURE \(MAP\) SENSOR REMOVAL/INSTALLATION \[LF\]](#).)

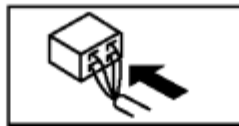
#### Circuit Open/Short Inspection

## MAP SENSOR WIRING HARNESS-SIDE CONNECTOR



## PCM WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



1. Disconnect the PCM connector. (See [PCM REMOVAL/INSTALLATION \[LF\]](#).)
2. Inspect the following wiring harnesses for an open or short circuit. (Continuity Inspection)

### Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - MAP/boost air temperature sensor terminal A and PCM terminal 2AV
  - MAP/boost air temperature sensor terminal C and PCM terminal 2AU
  - MAP/boost air temperature sensor terminal D and PCM terminal 2AG

### Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - MAP/boost air temperature sensor terminal A and power supply.
  - MAP/boost air temperature sensor terminal C and body ground.
  - MAP/boost air temperature sensor terminal D and power supply.
  - MAP/boost air temperature sensor terminal D and body ground.

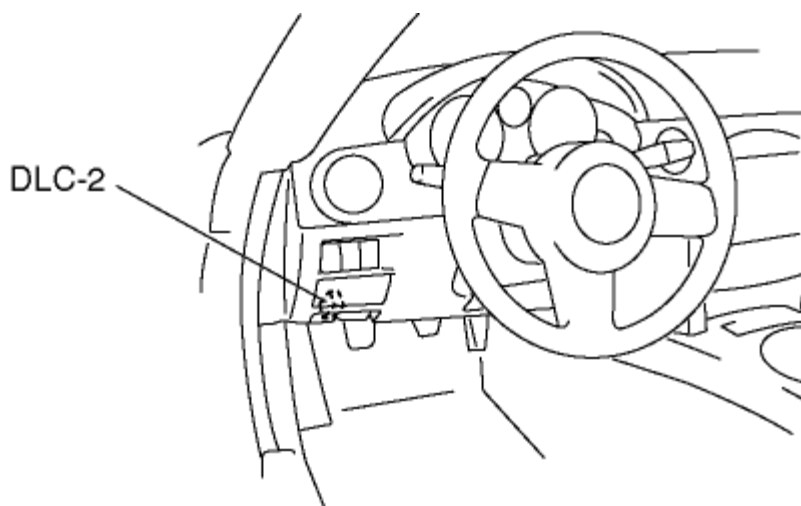


## 2008 - MX-5 - Engine

### BAROMETRIC PRESSURE (BARO) SENSOR INSPECTION [LF]

#### NOTE:

- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See [HOW TO USE THIS MANUAL.](#))
1. Connect the M-MDS to the DLC 2.



2. Turn the ignition switch to the ON position.
3. Select BARO PID on the M-MDS.
4. Verify that the BARO PID (pressure) and barometric pressure are practically equal.
  - If not as verified, replace the PCM. (See [PCM REMOVAL/INSTALLATION \[LF\].](#))

## 2008 - MX-5 - Engine

### CAMSHAFT POSITION (CMP) SENSOR INSPECTION [LF]

#### NOTE:

- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See [HOW TO USE THIS MANUAL](#).)

#### Visual Inspection

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the CMP sensor. (See [CAMSHAFT POSITION \(CMP\) SENSOR REMOVAL/INSTALLATION \[LF\]](#).)
4. Verify that there are no metal shavings on the sensor.
  - If the monitor item condition/specification (reference) is not within the specification even though there is no malfunction, carry out the "Circuit Open/Short Inspection".

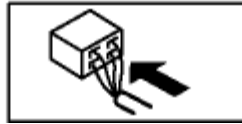
#### Voltage inspection

1. Install all removed parts.
2. Idle the engine.

#### CAUTION:

- Water penetrating the connector will cause sensor malfunction. To prevent this, be careful not to damage the wiring harnesses or the waterproof connector so as to cause water penetration.
3. Measure the output voltage using an oscilloscope.

## CMP SENSOR WIRING HARNESS-SIDE CONNECTOR



- If not within the specification, replace the CMP sensor. (See **CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION [LF]**.)
- If the monitor item condition/specification (reference) is not within the specification, even though the voltage is within the specification, carry out the "Circuit Open/Short Inspection".

### Voltage

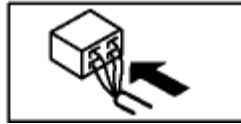
Terminal	Voltage (V)	Condition
C	B+	Under any condition
B	4.8 or more	High output*
	0.8 or less	Low output*
A	0	Under any condition

\*

**Output voltage varies with camshaft rotation.**

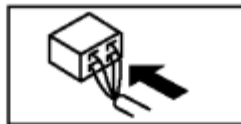
### Circuit Open/Short Inspection

## CMP SENSOR WIRING HARNESS-SIDE CONNECTOR



## PCM WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



1. Disconnect the PCM connector. (See [PCM REMOVAL/INSTALLATION \[LF\]](#).)
2. Inspect the following wiring harnesses for an open or short circuit. (Continuity Inspection)

### Open circuit

- If there is no continuity, the circuit is open. Repair or replace the wiring harness.
  - CMP sensor terminal A and PCM terminal 2P
  - CMP sensor terminal B and PCM terminal 2S
  - CMP sensor terminal C and PCM terminal 2AM

### Short circuit

- If there is continuity, the circuit is shorted. Repair or replace the wiring harness.
  - CMP sensor terminal A and power supply
  - CMP sensor terminal B and power supply
  - CMP sensor terminal B and body ground



- CMP sensor terminal C and body ground

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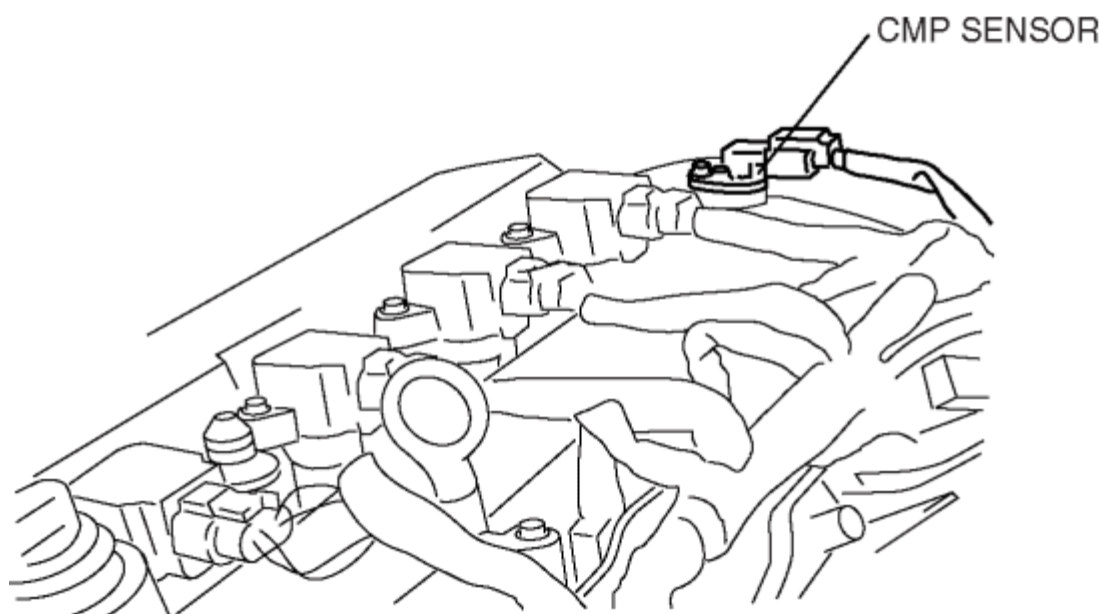
## 2008 - MX-5 - Engine

### CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION [LF]

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)

#### CAUTION:

- When replacing the camshaft position sensor, make sure there are no metal shavings adhering as they can cause the sensor output signal to malfunction from fluctuation in magnetic flux resulting in a deterioration in engine control. Cover a removed CMP sensor in plastic to protect it from foreign material adhering to it.
3. Disconnect the CMP sensor connector.



4. Remove the CMP sensor installation bolt.
5. Remove the CMP sensor from the cylinder head cover.
6. Install in the reverse order of removal.

#### CMP sensor tightening torque

- 5.5—7.5 N·m {56—76 kgf·cm, 49—66 in·lbf}

2008 - MX-5 - Engine

CLUTCH PEDAL POSITION (CPP) SWITCH INSPECTION [LF]

NOTE:

- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See [HOW TO USE THIS MANUAL](#).)

Continuity Inspection

1. Remove the CPP switch. (See [CLUTCH PEDAL REMOVAL/INSTALLATION](#).)
2. Verify that the continuity between CPP switch terminals D and B is as indicated in the table.
  - If not as indicated in the table, replace the CPP switch. (See [CLUTCH PEDAL REMOVAL/INSTALLATION](#).)
  - If the monitor item condition/specification (reference) is not within the specification, even though there is no malfunction, perform the "Circuit Open/Short Inspection".

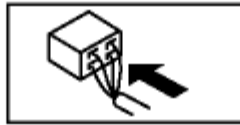
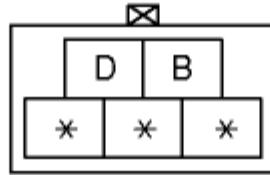
○ — ○ : Continuity

Condition	Terminal	
	D	B
Normal condition	○ —	— ○
Rod pushed		

Circuit Open/Short Inspection

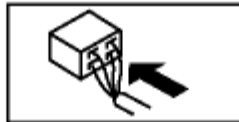
1. Disconnect the PCM connector. (See [PCM REMOVAL/INSTALLATION \[LF\]](#).)
2. Inspect the following wiring harness for open or short circuit (continuity Inspection).

## CPP SWITCH WIRING HARNESS-SIDE CONNECTOR



## PCM WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



### Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - CPP switch terminal B and PCM terminal 1D
  - CPP switch terminal D and body ground

### Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - CPP switch terminal B and body ground

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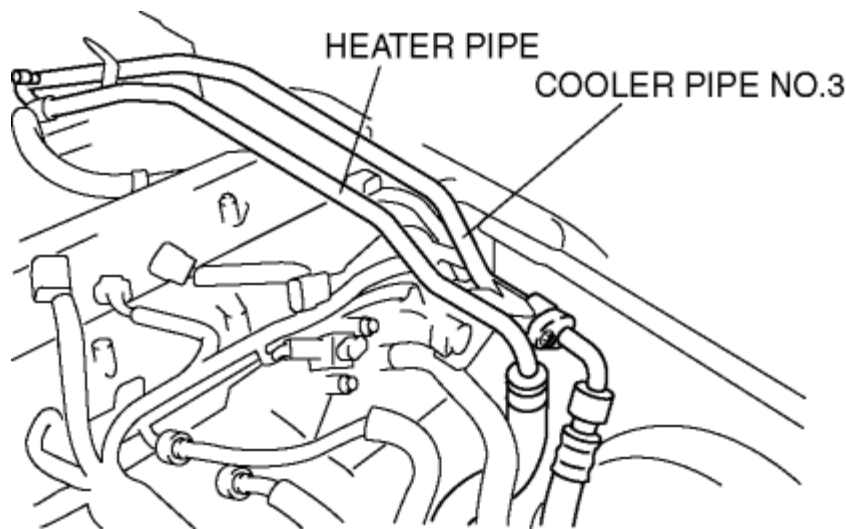
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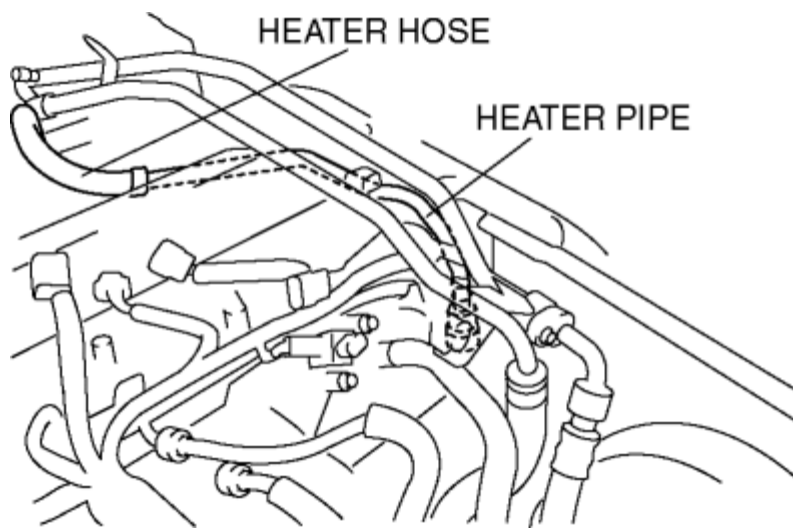
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### ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [LF]

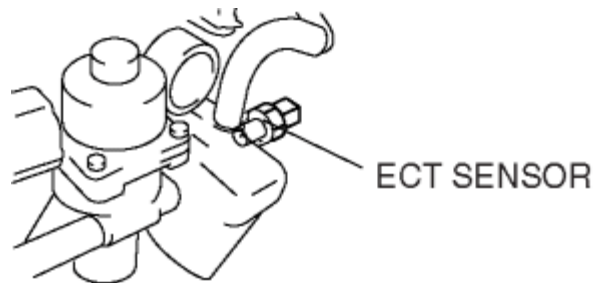
1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Drain the engine coolant from the radiator. (See [ENGINE COOLANT REPLACEMENT \[LF\]](#).)
4. Remove the service hole cover.
  - a. Remove the suspension tower bar (joint), (right side) and (left side). (See [FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION](#).)
  - b. Remove the wiper arm. (See [WIPER ARM AND BLADE REMOVAL/INSTALLATION](#).)
  - c. Remove the cowl grille. (See [COWL GRILLE REMOVAL/INSTALLATION](#).)
  - d. Remove the side cowl grille. (See [SIDE COWL GRILLE REMOVAL/INSTALLATION](#).)
  - e. Move the cooler pipe No.3 and heater pipe slightly out of the way.



- f. Remove the service hole cover. (See [EGR VALVE REMOVAL/INSTALLATION \[LF\]](#).)
5. Disconnect the heater hose and move the heater pipe slightly out of the way.

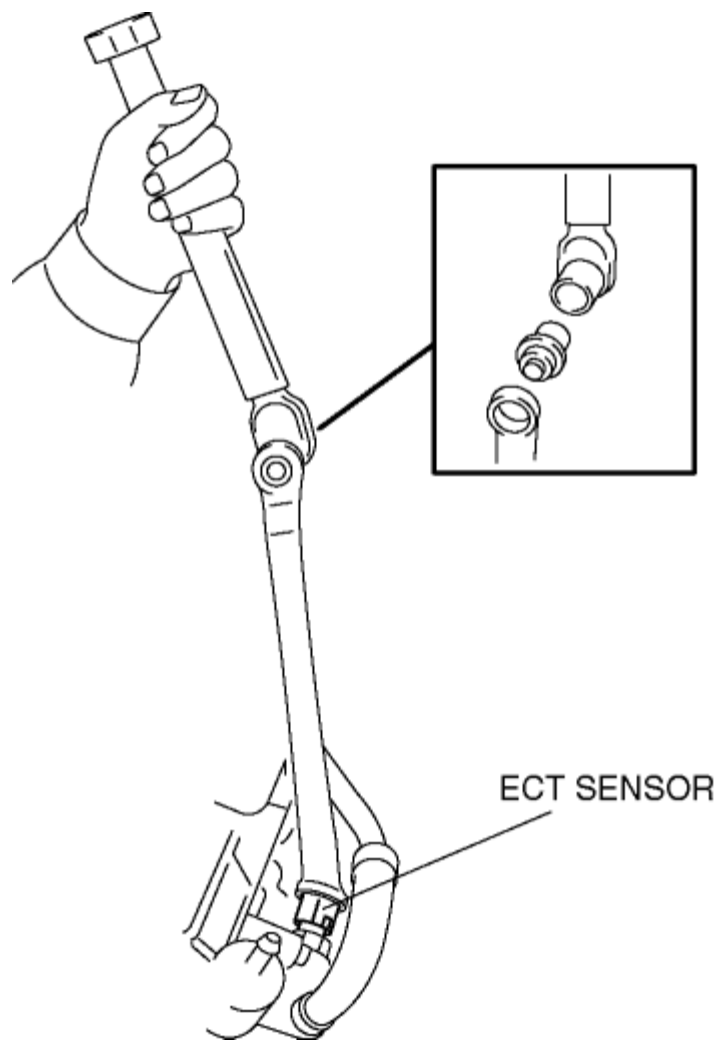


6. Disconnect the ECT sensor connector.
7. Remove the ECT sensor.



**NOTE:**

- Put the double nut together and install the torque wrench. (See **SERVICE CAUTIONS.**)
8. Install in the reverse order of removal.



- ECT sensor tightening torque
- 10—14 N·m { 1.1—1.4 kgf·m, 7.4—10.3 ft·lbf }

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## 2008 - MX-5 - Engine

### ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [LF]

**NOTE:**

- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See [HOW TO USE THIS MANUAL](#).)

#### Resistance Inspection

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Disconnect the ECT sensor connector.
4. Remove the ECT sensor. (See [ENGINE COOLANT TEMPERATURE \(ECT\) SENSOR REMOVAL/INSTALLATION \[LF\]](#).)
5. Place the ECT sensor in the water and while increasing the water temperature, measure the resistance between ECT sensor terminals A and B.
  - If the monitor item status/specification (reference) is not within the specification, even though the ECT sensor resistance is within the specification, perform the "Circuit Open/Short Inspection".
  - If not within the specification, replace the ECT sensor. (See [ENGINE COOLANT TEMPERATURE \(ECT\) SENSOR REMOVAL/INSTALLATION \[LF\]](#))

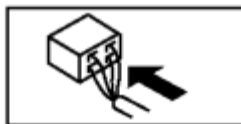
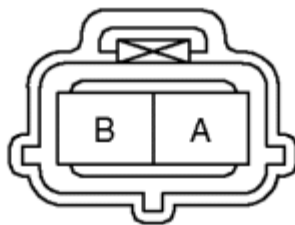
**Standard**

Water temperature (°C {°F})	Resistance (kilohm)
20 {68}	35.48—39.20
80 {176}	3.65—4.02

#### Circuit Open/Short Inspection

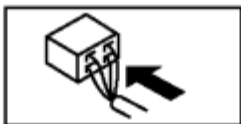


## ECT SENSOR HARNESS-SIDE CONNECTOR



## PCM WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



1. Disconnect the PCM connector. (See [PCM REMOVAL/INSTALLATION \[LF\]](#).)
2. Inspect the following wiring harnesses for an open or short circuit. (Continuity inspection)

### Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - ECT sensor terminal A and PCM terminal 2AH
  - ECT sensor terminal B and PCM terminal 2AY

### Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - ECT sensor terminal A and power supply
  - ECT sensor terminal A and body ground
  - ECT sensor terminal B and power supply



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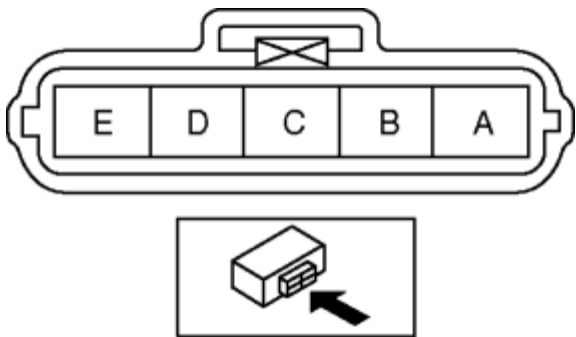
INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION [LF]

NOTE:

- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See [HOW TO USE THIS MANUAL](#).)

Resistance Inspection

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Disconnect the MAF/IAT sensor connector.
4. Verify that the resistance between MAF/IAT sensor terminals D and E is within the specification.

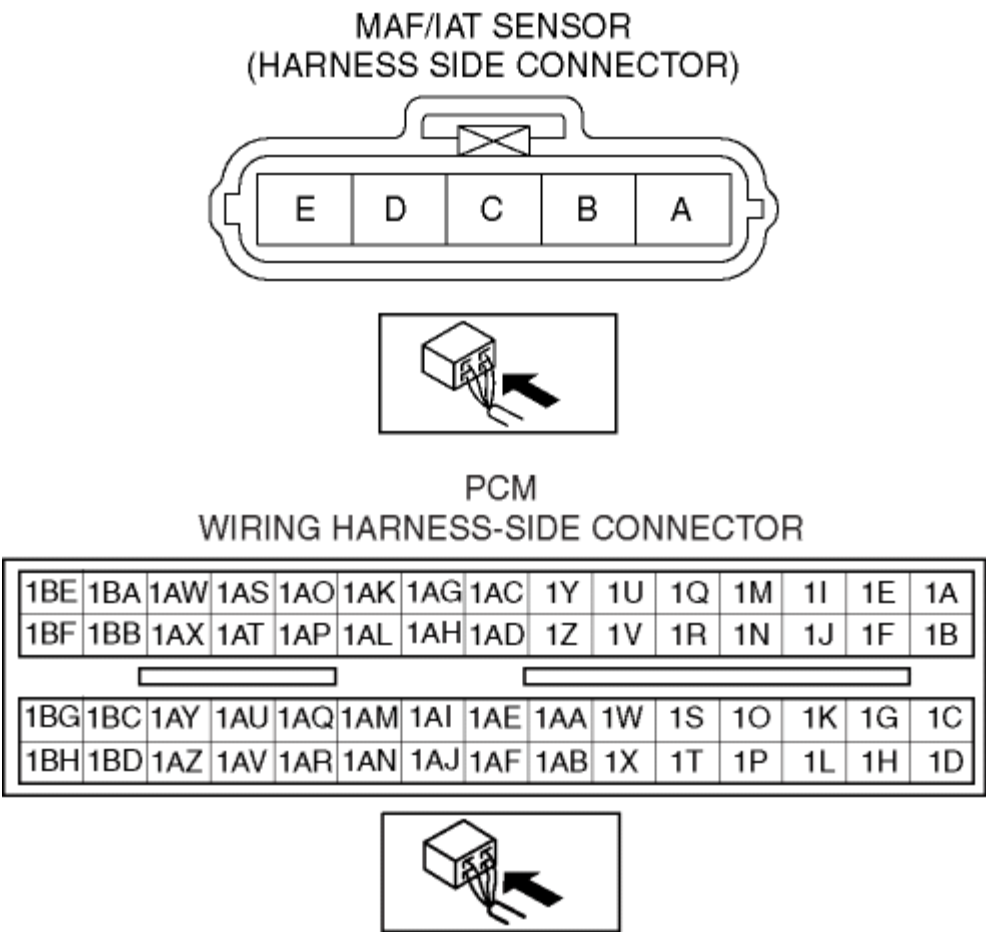


- If the monitor item status/specification (reference) is not within the specification, even though the IAT sensor resistance is within the specification, perform the “Circuit Open/Short Inspection”.
- If not within the specification, replace the MAF/IAT sensor. (See [MASS AIR FLOW \(MAF\)/INTAKE AIR TEMPERATURE \(IAT\) SENSOR REMOVAL/INSTALLATION \[LF\]](#).)

Standard

Ambient temperature (°C {°F})	Resistance (kilohm)
20 {68}	2.21—2.69
60 {140}	0.493—0.667

Circuit Open/Short Inspection



- 1. Disconnect the PCM connector. (See [PCM REMOVAL/INSTALLATION \[LF\]](#).)
- 2. Inspect the following wiring harnesses for an open or short circuit. (Continuity inspection)

Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - MAF/IAT sensor terminal D and PCM terminal 1AT
  - MAF/IAT sensor terminal E and PCM terminal 1AR

Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - MAF/IAT sensor terminal E and power supply
  - MAF/IAT sensor terminal D and power supply
  - MAF/IAT sensor terminal D and body ground

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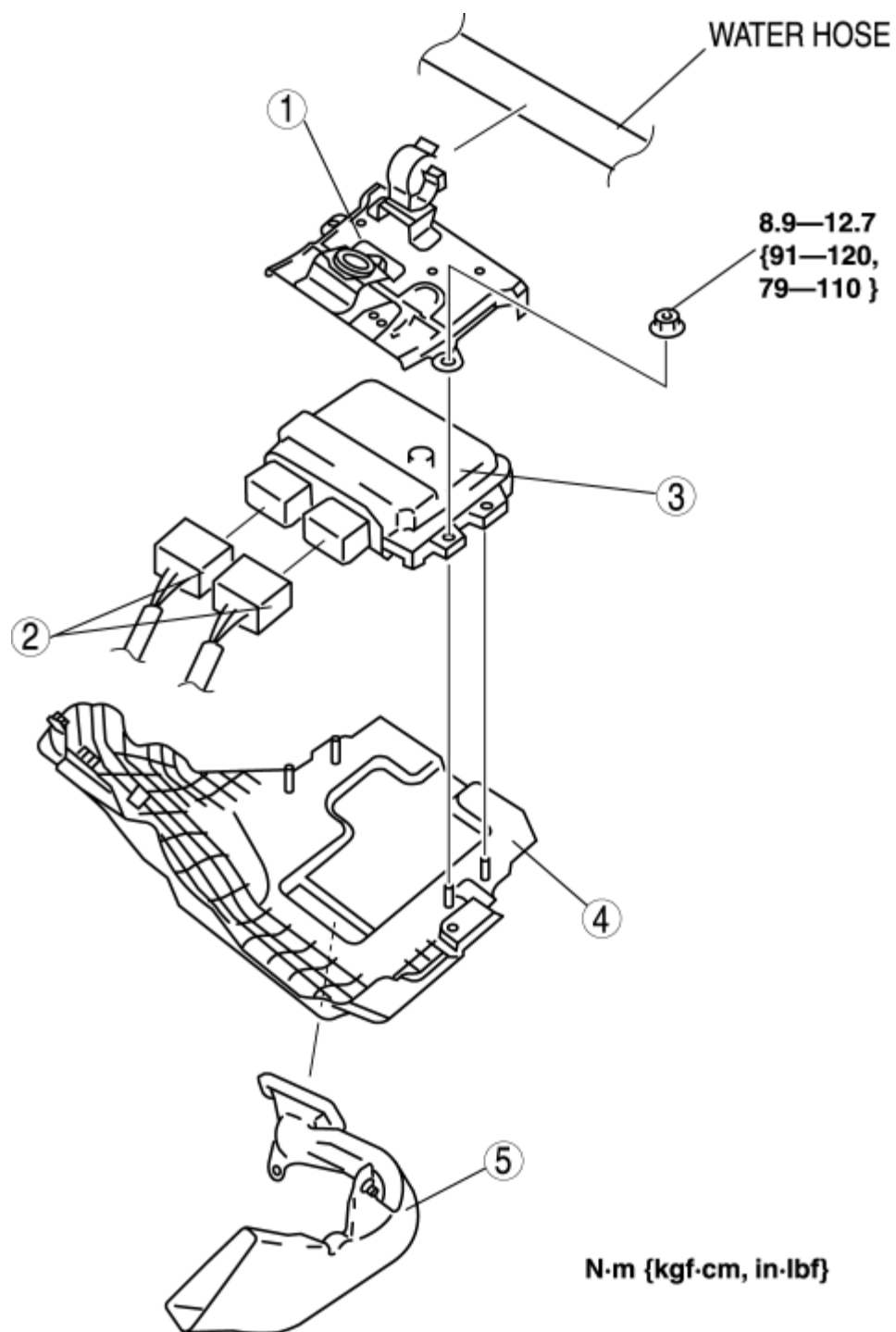
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### PCM REMOVAL/INSTALLATION [LF]

1. When replacing the PCM, perform the following:
  - PCM configuration (See [PCM CONFIGURATION \[LF\]](#).)
2. Remove the battery cover.
3. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
4. Remove the air cleaner case. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
5. Move the water hose from the PCM cover slightly out of the way.
6. Remove in the order indicated in the table.



1 PCM cover

2 PCM connector

(See [PCM REMOVAL/INSTALLATION \[LF\]](#).)

3 PCM

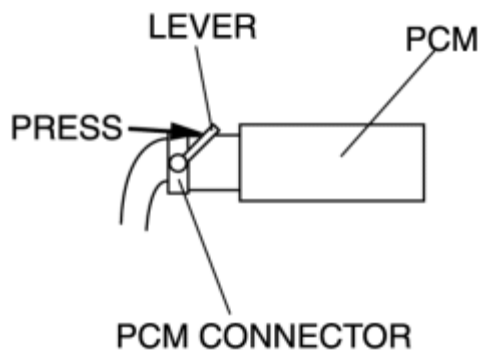
4 Air cleaner insulator

5PCM duct

7. Install in the reverse order of removal.
8. When replacing the PCM on the vehicles, perform the following:
  - PCM parameter reset (See **IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]**.) (See **IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]**.)

### PCM Connector Connected Note

1. Connect the PCM connector fully into the PCM and push the lever until a click is heard.



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PCM INSPECTION [LF]

Not Using the M-MDS

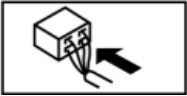
NOTE:

- The PCM terminal voltage can vary with the conditions when measuring and changes due to aged deterioration on the vehicle, causing false diagnosis. Therefore determine comprehensively where the malfunction occurs among the input systems, output systems, and the PCM.

PCM  
WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



Terminal	Signal	Connected to	Test condition	Voltage (V)	Inspection item
1A	—	—	—	—	—
1B	Starter relay control	Starter relay	Under any condition	Below 1.0	<ul style="list-style-type: none"><li>• Starter relay</li><li>• Related wiring harness</li></ul>
1C	—	—	—	—	—
1D*2	Clutch operation	CPP switch	Clutch pedal depressed	Below 1.0	<ul style="list-style-type: none"><li>• CPP switch</li><li>• Related wiring harness</li></ul>
			Clutch pedal released	B+	
1E	—	—	—	—	—
1F	—	—	—	—	—
1G	—	—	—	—	—
1H	Fuel pump control	Fuel pump relay	Ignition switch is turned to the ON position (Engine off) and a certain period has elapsed	B+	<ul style="list-style-type: none"><li>• Fuel pump relay</li><li>• Related wiring</li></ul>
			Cranking	Below 1.0	

			Idle		Below 1.0	harness
1I	A/C	A/C relay	Engine running	A/C operating	Below 1.0	<ul style="list-style-type: none"> <li>A/C relay</li> <li>Related wiring harness</li> </ul>
				A/C not operating	B+	
1J	Refrigerant pressure switch (middle)	Refrigerant pressure switch (middle)	Refrigerant pressure is more than the specification. (Refrigerant pressure switch (middle) is on.)		Below 1.0	<ul style="list-style-type: none"> <li>Refrigerant pressure switch (middle)</li> <li>Related wiring harness</li> </ul>
			Refrigerant pressure is less than the specification. (Refrigerant pressure switch (middle) is off.)		B+	
1K	—	—	—	—	—	—
1L	—	—	—	—	—	—
1M	Cooling fan control	Cooling fan relay No.1	During test mode*3	Accelerator pedal released	B+	<ul style="list-style-type: none"> <li>Cooling fan relay No.1</li> <li>Related wiring harness</li> </ul>
				Accelerator pedal depressed	Below 1.0	
1N	Cooling fan control	Cooling fan relay No.2	During test mode*3	Accelerator pedal released	B+	<ul style="list-style-type: none"> <li>Cooling fan relay No.2</li> <li>Related wiring harness</li> </ul>
				Accelerator pedal depressed	Below 1.0	
1O	—	—	—	—	—	—
1P	MAF sensor ground	MAF sensor	Under any condition		Below 1.0	<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
1Q	Main relay control	Main relay	Ignition switch is turned to the ON position		Below 1.0	<ul style="list-style-type: none"> <li>Main relay</li> <li>Related wiring harness</li> </ul>
			Ignition switch off and a certain period has elapsed		B+	
1R	Cooling fan control	Cooling fan relay No.3	During test mode*3	Accelerator pedal released	B+	<ul style="list-style-type: none"> <li>Cooling fan relay No.3</li> <li>Related wiring harness</li> </ul>
				Accelerator pedal depressed	Below 1.0	
1S	—	—	—	—	—	—
1T	—	—	—	—	—	—
1U	EVAP system leak detection	EVAP system leak detection	Ignition switch is turned to the ON position		B+	<ul style="list-style-type: none"> <li>EVAP system leak detection pump</li> </ul>

	pump (pump)	pump	Idle		B+	<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
1V	EVAP system leak detection pump (solenoid)	EVAP system leak detection pump	Ignition switch is turned to the ON position		B+	<ul style="list-style-type: none"> <li>EVAP system leak detection pump</li> <li>Related wiring harness</li> </ul>
			Idle		B+	
1W	—	—	—		—	—
1X	*2Neutral position	Neutral switch	Shift lever is at neutral position		Below 1.0	<ul style="list-style-type: none"> <li>Neutral switch</li> <li>Related wiring harness</li> </ul>
			Shift lever is not at neutral position		B+	
	*1Selector lever position	TR switch	Ignition switch is turned to the ON position	P, N position	Below 1.0	<ul style="list-style-type: none"> <li>TR switch</li> <li>Related wiring harness</li> </ul>
				Except above	B+	
1Y	—	—	—		—	—
1Z	—	—	—		—	—
1AA	—	—	—		—	—
1AB	Brake switch No.1	Brake switch	Brake pedal depressed		B+	<ul style="list-style-type: none"> <li>Brake switch</li> <li>Related wiring harness</li> </ul>
			Brake pedal released		Below 1.0	
1AC	—	—	—		—	—
1AD	—	—	—		—	—
1AE	—	—	—		—	—
1AF	Brake switch No.2	Brake switch	Brake pedal depressed		B+	<ul style="list-style-type: none"> <li>Brake switch</li> <li>Related wiring harness</li> </ul>
			Brake pedal released		Below 1.0	
1AG	—	—	—		—	—
1AH	—	—	—		—	—
1AI	CAN_L	CAN related module	Because this terminal is for CAN, no valid determination of terminal voltage is possible			<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
	APP sensor No.2					<ul style="list-style-type: none"> <li>Related</li> </ul>

1AJ	power supply	APP sensor	Ignition switch is turned to the ON position		Approx. 5.0	wiring harness
1AK	MAF	MAF sensor	Ignition switch is turned to the ON position		Approx. 0.7	<ul style="list-style-type: none"> <li>MAF sensor</li> <li>Related wiring harness</li> </ul>
			Idle		Approx. 1.4	
1AL	APP sensor No.1 power supply	APP sensor	Ignition switch is turned to the ON position.		Approx. 5.0	<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
1AM	CAN_H	CAN related module	Because this terminal is for CAN, no valid determination of terminal voltage is possible			<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
1AN	—	—	—		—	—
1AO	APP sensor No.1	APP sensor	Ignition switch is turned to the ON position	Accelerator pedal depressed	Approx. 3.9	<ul style="list-style-type: none"> <li>APP sensor</li> <li>Related wiring harness</li> </ul>
				Accelerator pedal released	Approx. 1.6	
1AP	APP sensor No.2	APP sensor	Ignition switch is turned to the ON position	Accelerator pedal depressed	Approx. 3.4	<ul style="list-style-type: none"> <li>APP sensor</li> <li>Related wiring harness</li> </ul>
				Accelerator pedal released	Approx. 1.0	
1AQ	Cruise control switch	Cruise control switch	Ignition switch is turned to the ON position	ON OFF switch pressed in	Approx. 0	<ul style="list-style-type: none"> <li>Cruise control switch</li> <li>Related wiring harness</li> </ul>
				CANCEL switch pressed in	Approx. 1.1	
				SET/– switch pressed in	Approx. 3.1	
				RES/+ switch pressed in	Approx. 4.2	
				Except above	Approx. 5.0	
1AR	Sensor ground	MAF/IAT sensor	Under any condition		Below 1.0	<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
1AS	APP sensor No.1 ground	APP sensor	Under any condition		Below 1.0	<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
1AT	IAT	MAF/IAT sensor	Ignition switch is turned to the ON position	IAT is 20 °C {68 °F}	Approx. 2.4	<ul style="list-style-type: none"> <li>IAT sensor</li> <li>Related wiring harness</li> </ul>
				IAT is 60°C {140 °F}	Approx. 0.9	
1AU	Refrigerant pressure switch (high, low)	Refrigerant pressure switch (high, low)	Ignition switch is turned to the ON position	A/C operating	Below 1.0	<ul style="list-style-type: none"> <li>Refrigerant pressure switch (high, low)</li> <li>Related wiring harness</li> </ul>
				A/C not operating	B+	

1AV	APP sensor No.2 ground	APP sensor	Under any condition		Below 1.0	<ul style="list-style-type: none"><li>• Related wiring harness</li></ul>
1AW	B+	Main relay	Ignition switch off		Below 1.0	<ul style="list-style-type: none"><li>• Main relay</li><li>• Battery</li><li>• Related wiring harness</li></ul>
			Ignition switch is turned to the ON position		B+	
1AX	Drive-by-wire relay control	Drive-by-wire relay	Under any condition		Below 1.0	<ul style="list-style-type: none"><li>• Drive-by-wire relay</li><li>• Related wiring harness</li></ul>
1AY	Ignition switch on	Ignition switch	Ignition switch off		Below 1.0	<ul style="list-style-type: none"><li>• Ignition switch</li><li>• Related wiring harness</li></ul>
			Ignition switch is turned to the ON position		B+	
1AZ	Ground	Ground	Under any condition		Below 1.0	<ul style="list-style-type: none"><li>• Related wiring harness</li></ul>
1BA	Back-up power supply	Battery (positive terminal)	Under any condition		B+	<ul style="list-style-type: none"><li>• Battery</li><li>• Related wiring harness</li></ul>
1BB	Ground	Ground	Under any condition		Below 1.0	<ul style="list-style-type: none"><li>• Related wiring harness</li></ul>
1BC	—	—	—		—	—
1BD	Ground	Ground	Under any condition		Below 1.0	<ul style="list-style-type: none"><li>• Related wiring harness</li></ul>
1BE	B+	Main relay	Ignition switch off		Below 1.0	<ul style="list-style-type: none"><li>• Main relay</li><li>• Related wiring harness</li></ul>
			Ignition switch is turned to the ON position		B+	
1BF	Drive-by-wire relay control	Drive-by-wire relay	Ignition switch is turned to the ON position	Drive-by-wire system is malfunction	Below 1.0	<ul style="list-style-type: none"><li>• Drive-by-wire relay</li><li>• Related wiring harness</li></ul>
				Drive-by-wire system is normal	B+	
1BG	—	—	—		—	—
1BH	Ground	Ground	Under any condition		Below 1.0	<ul style="list-style-type: none"><li>• Related wiring harness</li></ul>
						<ul style="list-style-type: none"><li>• Throttle valve</li></ul>

2A	Throttle control (+)	Throttle body (Throttle valve actuator)	Inspect using the wave profile. (See <a href="#">PCM INSPECTION [LF].</a> )		actuator  • Related wiring harness
2B	Throttle control (-)	Throttle body (Throttle valve actuator)	• Inspect using the wave profile. (See <a href="#">PCM INSPECTION [LF].</a> )		• Throttle valve actuator • Related wiring harness
2C	Purge control	Purge solenoid valve	• Inspect using the wave profile. (See <a href="#">PCM INSPECTION [LF].</a> )		• Purge solenoid valve • Related wiring harness
2D	—	—	—	—	—
2E	OCV control	OCV	• Inspect using the wave profile. (See <a href="#">PCM INSPECTION [LF].</a> )		• OCV • Related wiring harness
2F	—	—	—	—	—
2G	EGR valve #2 coil control	EGR valve (terminal A)	Idle (EGR control not operating)	B+	• EGR valve • Related wiring harness
2H	EGR valve #4 coil control	EGR valve (terminal F)	Idle (EGR control not operating)	B+	• EGR valve • Related wiring harness
2I <sup>1</sup>	Variable tumble control	Variable tumble solenoid valve	ECT 63 °C { 145 °F } or more or engine speed 3,750 rpm or more	B+	• Variable tumble solenoid valve • Related wiring harness
			ECT less than 63 °C { 145 °F } and engine speed less than 3,750 rpm	Below 1.0	
2J	Variable intake air control	Variable intake air solenoid valve	Ignition switch is turned to the ON position	Below 1.0	• Variable intake air solenoid valve • Related wiring harness
			Engine speed: less than 4,750 rpm	Below 1.0	
			Engine speed: 4,750 rpm or more	B+	
2K	EGR valve #1 coil control	EGR valve (terminal E)	Idle (EGR control not operating)	Below 1.0	• EGR valve • Related wiring harness
					• EGR valve

2L	EGR valve #3 coil control	EGR valve (terminal B)	Idle (EGR control not operating)		B+	<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
2M	—	—	—		—	—
2N	—	—	—		—	—
2O*4	Vehicle speed	VSS	<ul style="list-style-type: none"> <li>Inspect using the wave profile. (See <b>PCM INSPECTION [LF].</b>)</li> </ul>			<ul style="list-style-type: none"> <li>VSS</li> <li>Related wiring harness</li> </ul>
2P	CMP sensor ground	CMP sensor	Under any condition		Below 1.0	<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
2Q	Rear HO2S	Rear HO2S	Idle after warm-up		Alternates between 0 and 1.0	<ul style="list-style-type: none"> <li>Rear HO2S</li> <li>Related wiring harness</li> </ul>
2R	—	—	—		—	—
2S	CMP	CMP sensor	<ul style="list-style-type: none"> <li>Inspect using the wave profile. (See <b>PCM INSPECTION [LF].</b>)</li> </ul>			<ul style="list-style-type: none"> <li>CMP sensor</li> <li>Related wiring harness</li> </ul>
2T	Power steering pressure	PSP switch	Idle	Steering wheel at straight ahead position	B+	<ul style="list-style-type: none"> <li>PSP switch</li> <li>Related wiring harness</li> </ul>
				While turning steering wheel	Below 1.0	
2U	Knocking (+)	KS	Ignition switch ON (Use digital type voltmeter, because measurement voltage will be detected less than true voltage when using analog type voltmeter)		Approx. 4.3	<ul style="list-style-type: none"> <li>KS</li> <li>Related wiring harness</li> </ul>
2V	Knocking (–)	KS	Ignition switch ON (Use digital type voltmeter, because measurement voltage will be detected less than true voltage when using analog type voltmeter)		Below 1.0	<ul style="list-style-type: none"> <li>KS</li> <li>Related wiring harness</li> </ul>
2W	CKP	CKP sensor	<ul style="list-style-type: none"> <li>Inspect using the wave profile. (See <b>PCM INSPECTION [LF].</b>)</li> </ul>			<ul style="list-style-type: none"> <li>CKP sensor</li> <li>Related wiring harness</li> </ul>
2X	Ground	Shield wire	Under any condition		Below 1.0	<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
2Y	—	—	—		—	—
						<ul style="list-style-type: none"> <li>Front HO2S</li> </ul>

2Z	Front HO2S	Front HO2S	Idle after warm-up		Approx. 2.4	<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
2AA	—	—	—		—	—
2AB	CKP sensor ground	CKP sensor	Under any condition		Below 1.0	<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
2AC	—	—	—		—	—
2AD	Front HO2S	Front HO2S	Idle after warm-up		Approx. 2.8	<ul style="list-style-type: none"> <li>Front HO2S</li> <li>Related wiring harness</li> </ul>
2AE*1	Variable tumble shutter valve monitor	Variable tumble shutter valve switch	variable tumble shutter valve close		Below 1.0	<ul style="list-style-type: none"> <li>Variable tumble shutter valve switch</li> <li>Related wiring harness</li> </ul>
			variable tumble shutter valve open		B+	
2AF	—	—	—		—	—
2AG	Manifold absolute pressure	MAP sensor	Ignition switch is turned to the ON position (at sea level)		Approx. 4.1	<ul style="list-style-type: none"> <li>MAP sensor</li> <li>Related wiring harness</li> </ul>
			Idle		Approx. 1.2	
2AH	ECT	ECT sensor	Ignition switch is turned to the ON position	ECT is 20 °C {68 °F}	Approx. 3.0	<ul style="list-style-type: none"> <li>ECT sensor</li> <li>Related wiring harness</li> </ul>
				ECT is 80 °C {176 °F}	Approx. 0.9	
2AI	Generator field coil control	Generator (terminal D)	<ul style="list-style-type: none"> <li>Inspect using the wave profile.</li> </ul> (See <a href="#">PCM INSPECTION [LF].</a> )			<ul style="list-style-type: none"> <li>Generator</li> <li>Related wiring harness</li> </ul>
2AJ	Generator output voltage	Generator (terminal P)	<ul style="list-style-type: none"> <li>Inspect using the wave profile.</li> </ul> (See <a href="#">PCM INSPECTION [LF].</a> )			<ul style="list-style-type: none"> <li>Generator</li> <li>Related wiring harness</li> </ul>
2AK	Throttle valve opening angle No. 1	Throttle body (TP sensor)	Ignition switch is turned to the ON position	Accelerator pedal depressed	Approx. 4.5	<ul style="list-style-type: none"> <li>TP sensor</li> <li>Related wiring harness</li> </ul>
				Accelerator pedal released	Approx. 0.5	
2AL	Throttle valve opening angle No. 2	Throttle body (TP sensor)	Ignition switch is turned to the ON position	Accelerator pedal depressed	Approx. 0.5	<ul style="list-style-type: none"> <li>TP sensor</li> <li>Related wiring harness</li> </ul>
				Accelerator pedal released	Approx. 4.5	



2AM	Constant voltage	CMP sensor	Ignition switch is turned to the ON position	B+	<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
2AN	—	—	—	—	—
2AO	Constant voltage (Vref)	Throttle body (TP sensor)	Ignition switch is turned to the ON position	Approx. 5.0	<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
2AP	Sensor ground	Throttle body (TP sensor)	Under any condition	Below 1.0	<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
2AQ	Constant voltage	CKP sensor	Ignition switch is turned to the ON position	B+	<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
2AR	—	—	—	—	—
2AS	—	—	—	—	—
2AT	IGT4	Ignition coil (No.4 cylinders)	<ul style="list-style-type: none"> <li>Inspect using the wave profile. (See <a href="#">PCM INSPECTION [LF]</a>.)</li> </ul>		<ul style="list-style-type: none"> <li>Ignition coil No.4</li> <li>Related wiring harness</li> </ul>
2AU	Constant voltage (Vref)	MAP sensor	Ignition switch is turned to the ON position	Approx. 5.0	<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
2AV	MAP sensor ground	MAP sensor	Under any condition	Below 1.0	<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
2AW	IGT2	Ignition coil (No.2 cylinders)	<ul style="list-style-type: none"> <li>Inspect using the wave profile. (See <a href="#">PCM INSPECTION [LF]</a>.)</li> </ul>		<ul style="list-style-type: none"> <li>Ignition coil No.2</li> <li>Related wiring harness</li> </ul>
2AX	IGT3	Ignition coil (No.3 cylinders)	<ul style="list-style-type: none"> <li>Inspect using the wave profile. (See <a href="#">PCM INSPECTION [LF]</a>.)</li> </ul>		<ul style="list-style-type: none"> <li>Ignition coil No.3</li> <li>Related wiring harness</li> </ul>
2AY	ECT sensor ground	ECT sensor	Under any condition	Below 1.0	<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
2AZ	Fuel injection (#4)	Fuel injector No.4	<ul style="list-style-type: none"> <li>Inspect using the wave profile. (See <a href="#">PCM INSPECTION [LF]</a>.)</li> </ul>		<ul style="list-style-type: none"> <li>Fuel injector No.4</li> <li>Related wiring harness</li> </ul>
					<ul style="list-style-type: none"> <li>Ignition coil No.1</li> </ul>

2BA	IGT1	Ignition coil (No.1 cylinders)	<ul style="list-style-type: none"> <li>Inspect using the wave profile. (See <a href="#">PCM INSPECTION [LF].</a>)</li> </ul>		<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
2BB	Fuel injection (#1)	Fuel injector No.1	<ul style="list-style-type: none"> <li>Inspect using the wave profile. (See <a href="#">PCM INSPECTION [LF].</a>)</li> </ul>		<ul style="list-style-type: none"> <li>Fuel injector No.1</li> <li>Related wiring harness</li> </ul>
2BC	Fuel injection (#2)	Fuel injector No.2	<ul style="list-style-type: none"> <li>Inspect using the wave profile. (See <a href="#">PCM INSPECTION [LF].</a>)</li> </ul>		<ul style="list-style-type: none"> <li>Fuel injector No.2</li> <li>Related wiring harness</li> </ul>
2BD	Fuel injection (#3)	Fuel injector No.3	<ul style="list-style-type: none"> <li>Inspect using the wave profile. (See <a href="#">PCM INSPECTION [LF].</a>)</li> </ul>		<ul style="list-style-type: none"> <li>Fuel injector No.3</li> <li>Related wiring harness</li> </ul>
2BE	Rear HO2S heater control	Rear HO2S heater	Heavy load (Heater control not operating)	B+	<ul style="list-style-type: none"> <li>Rear HO2S heater</li> <li>Related wiring harness</li> </ul>
2BF	—	—	—	—	—
2BG	Front HO2S heater control	Front HO2S heater	<ul style="list-style-type: none"> <li>Inspect using the wave profile. (See <a href="#">PCM INSPECTION [LF].</a>)</li> </ul>		<ul style="list-style-type: none"> <li>Front HO2S heater</li> <li>Related wiring harness</li> </ul>
2BH	Rear HO2S ground	Rear HO2S	Under any condition	Below 1.0	<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>

\*1

AT

\*2

MT

\*3

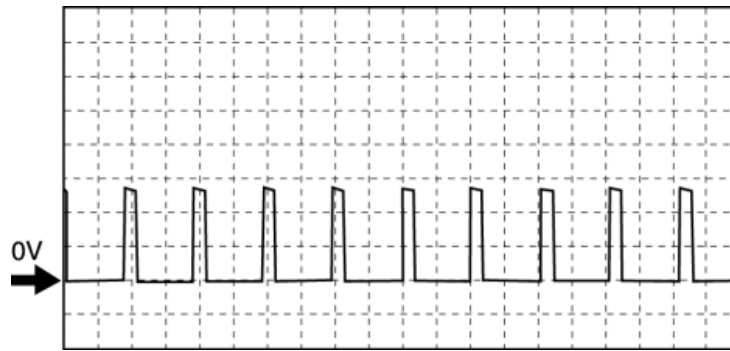
Turn the test mode on using the M-MDS simulation function.

\*4

MT without ABS/DSC

### Inspection Using An Oscilloscope (Reference)

Throttle control (+) signal



#### PCM terminals

- 2A (+)—Negative battery terminal (–)

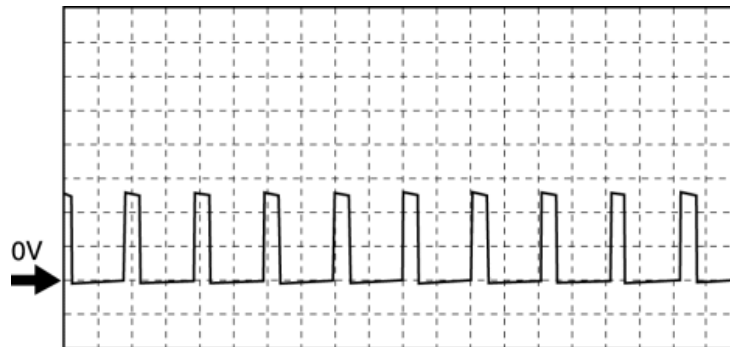
#### Oscilloscope setting

- 5 V/DIV (Y), 1 ms/DIV (X), DC range

#### Vehicle condition

- Idle (Accelerator pedal released)

#### Throttle control (–) signal



#### PCM terminals

- 2B (+)—Negative battery terminal (–)

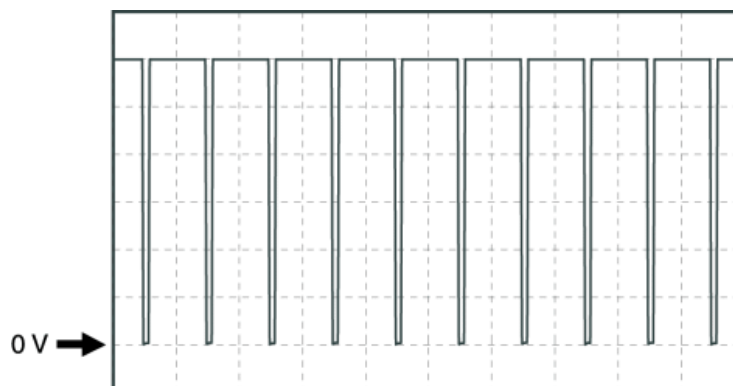
#### Oscilloscope setting

- 5 V/DIV (Y), 1 ms/DIV (X), DC range

#### Vehicle condition

- Idle (Accelerator pedal released)

#### Purge control signal



#### PCM terminals

- 2C (+)—Negative battery terminal (–)

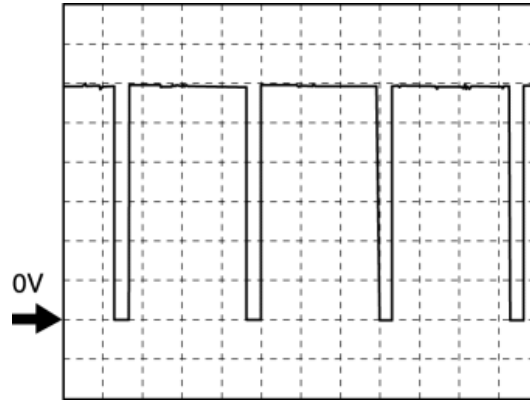
#### Oscilloscope setting

- 2 V/DIV (Y), 0.1 s/DIV (X), DC range

#### Vehicle condition

- Idle after warm-up

#### OCV control signal



#### PCM terminals

- 2E (+)—Negative battery terminal (–)

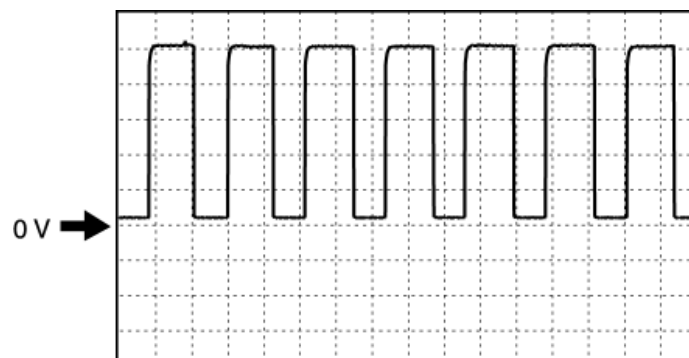
#### Oscilloscope setting

- 2.5 V/DIV (Y), 1 ms/DIV (X), DC range

#### Vehicle condition

- Idle after warm-up

#### Vehicle speed signal



#### PCM terminals

- 2O (+)—Negative battery terminal (–)

#### Oscilloscope setting

- 1 V/DIV (Y), 10 ms/DIV (X), DC range

#### Vehicle condition

- Vehicle speed is 10 km/h {6.2 mph}

#### CMP signal



**PCM terminals**

- 2S (+)—Negative battery terminal (–)

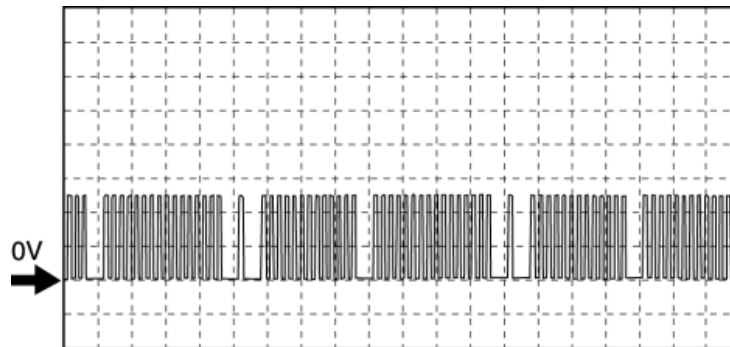
**Oscilloscope setting**

- 2 V/DIV (Y), 50 ms/DIV (X), DC range

**Vehicle condition**

- Idle after warm-up

**CKP signal**



**PCM terminals**

- 2W (+)—Negative battery terminal (–)

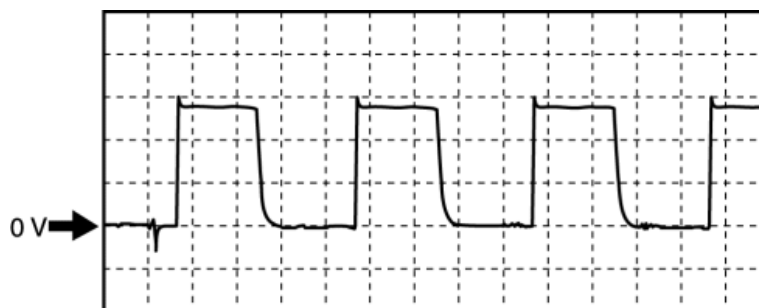
**Oscilloscope setting**

- 2 V/DIV (Y), 10 ms/DIV (X), DC range

**Vehicle condition**

- Idle after warm-up

**Generator field coil control signal**



**PCM terminals**

- 2AI (+)—Negative battery terminal (–)

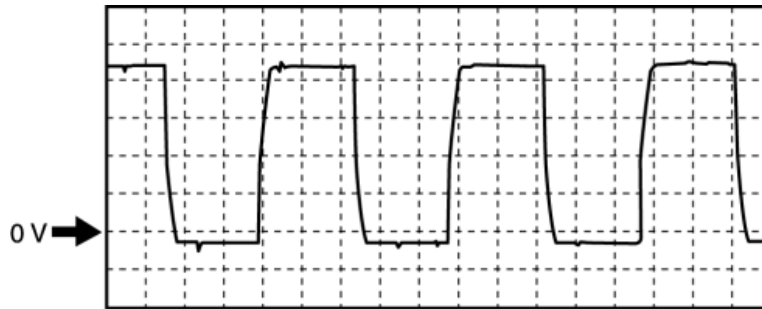
**Oscilloscope setting**

- 0.5 V/DIV (Y), 1 ms/DIV (X), DC range

#### Vehicle condition

- Idle after warm-up

#### Generator output voltage signal



#### PCM terminals

- 2AJ (+)—Negative battery terminal (—)

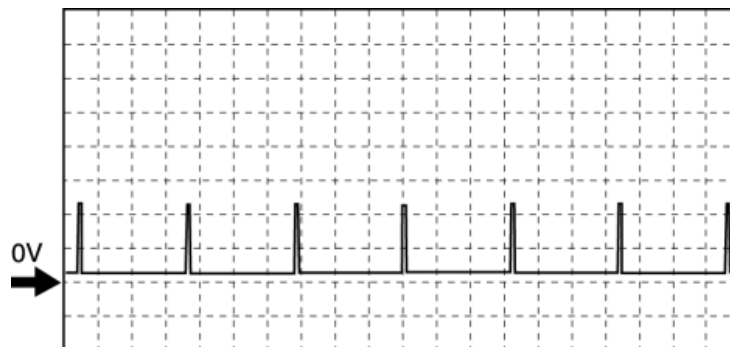
#### Oscilloscope setting

- 2 V/DIV (Y), 1 ms/DIV (X), DC range

#### Vehicle condition

- Idle after warm-up

#### Ignition timing signals



#### PCM terminals

- IGT1 (No.1): 2BA (+)—Negative battery terminal (—)
- IGT2 (No.2): 2AW (+)—Negative battery terminal (—)
- IGT3 (No.3): 2AX (+)—Negative battery terminal (—)
- IGT4 (No.4): 2AT (+)—Negative battery terminal (—)

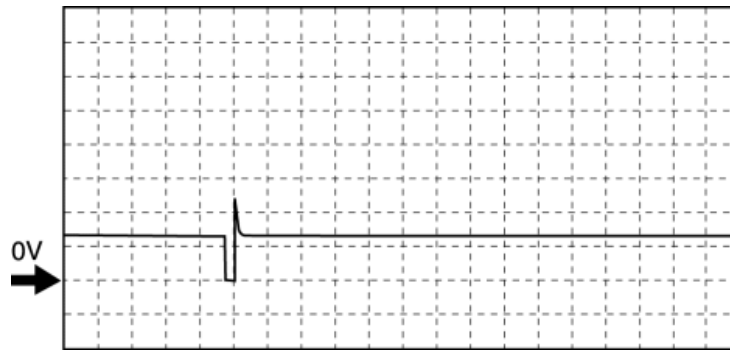
#### Oscilloscope setting

- 2 V/DIV (Y), 50 ms/DIV (X), DC range

#### Vehicle condition

- Idle after warm-up

#### Fuel injection signals



#### PCM terminals

- Fuel Injection No.1: 2BB (+)—Negative battery terminal (–)
- Fuel Injection No.2: 2BC (+)—Negative battery terminal (–)
- Fuel Injection No.3: 2BD (+)—Negative battery terminal (–)
- Fuel Injection No.4: 2AZ (+)—Negative battery terminal (–)

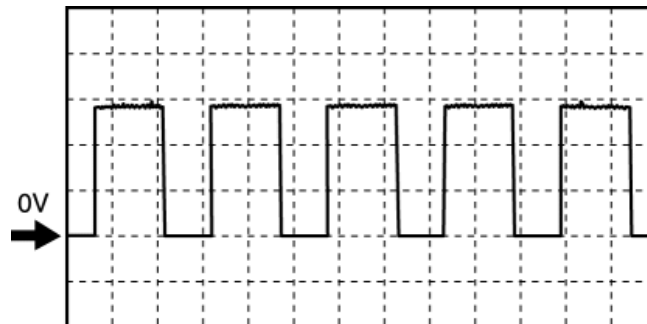
#### Oscilloscope setting

- 10 V/DIV (Y), 10 ms/DIV (X), DC range

#### Vehicle condition

- Idle after warm-up

#### Front HO2S heater control signal



#### PCM terminals

- 2BG (+)—Negative battery terminal (–)

#### Oscilloscope setting

- 5 V/DIV (Y), 50 ms/DIV (X), DC range

#### Vehicle condition

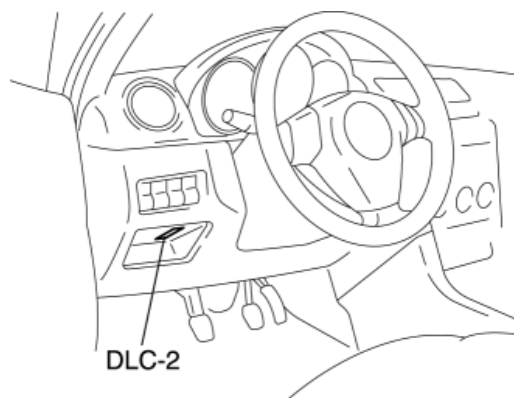
- Idle after warm-up (no load)

#### Using the M-MDS

##### NOTE:

- PIDs for the following parts are not available on this model. Go to the appropriate part inspection page.
  - CMP sensor
  - Main relay

1. Connect the **SST** (M-MDS) to the DLC-2.



2. Turn the ignition switch to ON position.

3. Measure the PID value.

- If PID value is not within the specification, follow the instructions in "Inspection item (s)" column.

**NOTE:**

- The PID/DATA MONITOR function monitors the calculated value of the input/output signals in the PCM. Therefore, an output device malfunction is not directly indicated as a malfunction of the monitored value for the output device. If a monitored value of an output device is out of specification, inspect the monitored value of the input device related to the output control.
- For input/output signals except those of the monitoring items, use a voltmeter to measure the PCM terminal voltage.
- The simulation items that are used in the ENGINE CONTROL SYSTEM OPERATION INSPECTION are as follows.
  - ACCS, ALTF, ARPMDES, EVAPCP, FAN1, FAN2, FAN3, FP, FUELWP1, GENVDSD, HTR11, HTR12, IMTV, INJ\_1, INJ\_2, INJ\_3, INJ\_4, SEGRP, test, VT DUTY1 Wt

**PID/DATA monitor table (reference)**

Item (definition)	Unit/Condition		Condition/Specification (Reference)	Inspection item(s)	PCM terminal
AAT (Ambient air temperature)	°C	°F	<ul style="list-style-type: none"> <li>• Ignition switch is turned to the ON position: Indicates the ambient air temperature</li> </ul>	<ul style="list-style-type: none"> <li>• The following PIDs               <ul style="list-style-type: none"> <li>▪ IAT</li> </ul> </li> </ul>	—
AC_REQ (Refrigerant pressure switch (high, low))	On/Off		<ul style="list-style-type: none"> <li>• Refrigerant pressure is more than the specification or less than the specification. (Refrigerant pressure switch (high, low) is off.): Off</li> <li>• Except above: On</li> </ul>	<ul style="list-style-type: none"> <li>• Refrigerant pressure switch (high, low)</li> <li>• A/C amplifier</li> </ul>	1AU
ACCS (A/C relay)	On/Off		<ul style="list-style-type: none"> <li>• A/C relay is ON: On</li> <li>• A/C relay is OFF: Off</li> </ul>	<ul style="list-style-type: none"> <li>• The following PIDs               <ul style="list-style-type: none"> <li>▪ CPP*<sup>1</sup>, CPP/PNP*<sup>1</sup>, ECT, RPM, TP, TR*<sup>2</sup>, AC_REQ, COLP</li> </ul> </li> </ul>	11
AFR (Air/fuel ratio)	—		<ul style="list-style-type: none"> <li>• Idle after warm-up: Approx. 1</li> </ul>	<ul style="list-style-type: none"> <li>• Front HO2S</li> </ul>	2AD
AFR_ACT (Actual air/fuel ratio)	—		<ul style="list-style-type: none"> <li>• Idle after warm-up: Approx. 1</li> </ul>	<ul style="list-style-type: none"> <li>• Front HO2S</li> <li>• Rear HO2S</li> </ul>	—



ALTF (Generator field coil control duty value)	%			<ul style="list-style-type: none"> <li>Ignition switch is turned to the ON position: 0%</li> <li>Idle, E/L is operating: Duty value increases.</li> </ul>	<ul style="list-style-type: none"> <li>Generator</li> </ul>	2AI
ALTT V (Generator output voltage)	V			<ul style="list-style-type: none"> <li>Idle (no E/L): Approx. 14 V (This is an internal calculation value and differs from the terminal voltage.)</li> </ul>	<ul style="list-style-type: none"> <li>Generator</li> </ul>	2AJ
APP (Accelerator pedal position)	%			<ul style="list-style-type: none"> <li>Accelerator pedal released: 0%</li> <li>Accelerator pedal depressed: 100%</li> </ul>	<ul style="list-style-type: none"> <li>The following PIDs <ul style="list-style-type: none"> <li>APP1, APP2</li> </ul> </li> </ul>	1AO, 1AP
APP1 (APP sensor No.1)	%			<ul style="list-style-type: none"> <li>Accelerator pedal released: Approx. 32%</li> <li>Accelerator pedal depressed: Approx. 78%</li> </ul>	<ul style="list-style-type: none"> <li>APP sensor</li> </ul>	1AO
	V			<ul style="list-style-type: none"> <li>Accelerator pedal released: Approx. 1.6 V</li> <li>Accelerator pedal depressed: Approx. 3.9 V</li> </ul>		
APP2 (APP sensor No.2)	%			<ul style="list-style-type: none"> <li>Accelerator pedal released: Approx. 21%</li> <li>Accelerator pedal depressed: Approx. 67%</li> </ul>	<ul style="list-style-type: none"> <li>APP sensor</li> </ul>	1AP
	V			<ul style="list-style-type: none"> <li>Accelerator pedal released: Approx. 1.0 V</li> <li>Accelerator pedal depressed: Approx. 3.4 V</li> </ul>		
ARPMDES (Target engine speed)	RPM			<ul style="list-style-type: none"> <li>Indicates the target engine speed.</li> </ul>	<ul style="list-style-type: none"> <li>The following PIDs <ul style="list-style-type: none"> <li>CPP*<sup>1</sup>, CPP/PNP*<sup>1</sup>, ECT, IAT, RPM, TP, MAF, MAP, VSS, AC_REQ, COLP</li> </ul> </li> </ul>	—
BARO (Barometric pressure)	Pa	Bar	psi	<ul style="list-style-type: none"> <li>Ignition switch is turned to the ON position: Indicates the barometric pressure</li> </ul>	—	—
	V			<ul style="list-style-type: none"> <li>Ignition switch is turned to the ON position (at sea level): 4.1 V</li> </ul>		
BOO (Brake switch)	On/Off			<ul style="list-style-type: none"> <li>Brake pedal depressed: On</li> <li>Brake pedal released: Off</li> </ul>	<ul style="list-style-type: none"> <li>Brake switch</li> </ul>	1AB, 1AF
BPA (Brake pressure applied switch)	On/Off			<ul style="list-style-type: none"> <li>Brake pedal depressed: On</li> <li>Brake pedal released: Off</li> </ul>	<ul style="list-style-type: none"> <li>Brake switch</li> </ul>	—
CATT11_DSD				<ul style="list-style-type: none"> <li>Ignition switch is turned to the</li> </ul>		

(Catalyst temperature)	°C	°F	ON position: Indicates the catalyst temperature	—	—
CHRGLP (Generator warning light)	On/Off		<ul style="list-style-type: none"> <li>Idle, Generator warning light illuminate: On</li> <li>Idle, Generator warning light not illuminate: Off</li> </ul>	<ul style="list-style-type: none"> <li>Generator warning light</li> </ul>	—
COLP (Refrigerant pressure switch (middle))	ON/OFF		<ul style="list-style-type: none"> <li>Refrigerant pressure is more than the specification. (Refrigerant pressure switch (middle) is on.): On</li> <li>Refrigerant pressure is less than the specification. (Refrigerant pressure switch (middle) is off.): Off</li> </ul>	<ul style="list-style-type: none"> <li>Refrigerant pressure switch (middle)</li> </ul>	1J
CPP*1 (Clutch pedal position)	On/Off		<ul style="list-style-type: none"> <li>Clutch pedal depressed: On</li> <li>Clutch pedal released: Off</li> </ul>	<ul style="list-style-type: none"> <li>CPP switch</li> </ul>	1D
CPP/PNP*1 (Shift lever position)	Drive/Neutral		<ul style="list-style-type: none"> <li>Neutral: Neutral</li> <li>Other than neutral: Drive</li> </ul>	<ul style="list-style-type: none"> <li>Neutral switch</li> </ul>	1X
DTCCNT (Number of DTC detected)	—		<ul style="list-style-type: none"> <li>Number of DTCs stored</li> </ul>	—	—
ECT (Engine coolant temperature)	°C	°F	<ul style="list-style-type: none"> <li>Ignition switch is turned to the ON position: Indicates the ECT</li> </ul>	<ul style="list-style-type: none"> <li>ECT sensor</li> </ul>	2AH
	V		<ul style="list-style-type: none"> <li>ECT is 20 °C {68 °F}: Approx. 3.0 V</li> <li>ECT is 80 °C {176 °F}: Approx. 0.9 V</li> </ul>		
EQ_RAT11 (Actual lambda signal)	—		<ul style="list-style-type: none"> <li>Idle after warm-up: Approx. 1</li> </ul>	<ul style="list-style-type: none"> <li>Front HO2S</li> </ul>	—
EQ_RAT11_DSD (Target lambda)	—		<ul style="list-style-type: none"> <li>Target lambda (Excess air factor = supplied air amount / theoretical air/fuel ratio)</li> </ul>	<ul style="list-style-type: none"> <li>Front HO2S</li> </ul>	—
ETC_ACT (Throttle control)	°		<ul style="list-style-type: none"> <li>Accelerator pedal released: Approx. 0 °</li> <li>Accelerator pedal depressed: Approx. 94.5 °</li> </ul>	<ul style="list-style-type: none"> <li>TP sensor</li> </ul>	—
ETC_DSD (Throttle control desired)	%		<ul style="list-style-type: none"> <li>Indicates the target throttle valve opening ratio</li> </ul>	<ul style="list-style-type: none"> <li>The following PIDs <ul style="list-style-type: none"> <li>APP, RPM</li> </ul> </li> </ul>	—
	°		<ul style="list-style-type: none"> <li>Indicates the target throttle valve opening angle</li> </ul>		
EVAPCP			<ul style="list-style-type: none"> <li>Ignition switch is turned to the ON position: 0%</li> </ul>	<ul style="list-style-type: none"> <li>The following PIDs <ul style="list-style-type: none"> <li>ECT, IAT, RPM, TP, MAF,</li> </ul> </li> </ul>	

(Purge solenoid valve duty value)	%	<ul style="list-style-type: none"> <li>Increase the engine speed (after warm-up): Duty value rises</li> </ul>	O2S11, O2S12, BOO, VPWR  <ul style="list-style-type: none"> <li>Purge solenoid valve</li> </ul>	2C
FAN1 (Cooling fan relay No.1 control signal)	On/Off	<ul style="list-style-type: none"> <li>During test mode CTP: Off WOT: On</li> </ul>	<ul style="list-style-type: none"> <li>The following PIDs               <ul style="list-style-type: none"> <li>ECT, test, TP</li> </ul> </li> </ul>	1M
FAN2 (Cooling fan relay No.2 control signal)	On/Off	<ul style="list-style-type: none"> <li>During test mode CTP: Off WOT: On</li> </ul>	<ul style="list-style-type: none"> <li>The following PIDs               <ul style="list-style-type: none"> <li>ECT, test, TP</li> </ul> </li> </ul>	1N
FAN3 (Cooling fan relay No.3 control signal)	On/Off	<ul style="list-style-type: none"> <li>During test mode CTP: Off WOT: On</li> </ul>	<ul style="list-style-type: none"> <li>The following PIDs               <ul style="list-style-type: none"> <li>ECT, test, TP</li> </ul> </li> </ul>	1R
FLI (Fuel level)	%	<ul style="list-style-type: none"> <li>Indicates the fuel level</li> </ul>	—	—
FP (Fuel pump relay)	On/Off	<ul style="list-style-type: none"> <li>Ignition switch is turned to the ON position and a certain period has elapsed: Off</li> <li>Cranking: On</li> <li>Idle: On</li> </ul>	<ul style="list-style-type: none"> <li>Fuel pump relay</li> </ul>	1H
FUELPW (Fuel injector duration)	sec	<ul style="list-style-type: none"> <li>Idle: Approx. 2.0 ms</li> </ul>	<ul style="list-style-type: none"> <li>The following PIDs               <ul style="list-style-type: none"> <li>CPP<sup>*1</sup>, CPP/PNP<sup>*1</sup>, ECT, IAT, RPM, TP, MAF, O2S11, O2S12, MAP, VSS, TR<sup>*2</sup>, BOO, AC_REQ, COLP, VPWR</li> </ul> </li> </ul>	2BB, 2BC, 2BD, 2AZ
FUELSYS (Fuel system status)	OL/CL/ OL–Drive/ OL–Fault/ CL–Fault	<ul style="list-style-type: none"> <li>Idle after warm-up: CL</li> </ul>	<ul style="list-style-type: none"> <li>The following PIDs               <ul style="list-style-type: none"> <li>CPP<sup>*1</sup>, CPP/PNP<sup>*1</sup>, ECT, IAT, RPM, TP, MAF, O2S11, O2S12, MAP, VSS, TR<sup>*2</sup>, BOO, AC_REQ, COLP, VPWR</li> </ul> </li> </ul>	—
GENVDSD		<ul style="list-style-type: none"> <li>Indicates the target generated</li> </ul>	<ul style="list-style-type: none"> <li>The following PIDs               <ul style="list-style-type: none"> <li>ECT, IAT, RPM, VSS,</li> </ul> </li> </ul>	

(Target generator voltage)	V		voltage	ALTT V, VPWR	—
				<ul style="list-style-type: none"> <li>Generator</li> </ul>	
HTR11 (Front HO2S heater control)	On/Off		<ul style="list-style-type: none"> <li>Ignition switch is turned to the ON position: Off</li> <li>Idle: On</li> </ul>	<ul style="list-style-type: none"> <li>The following PIDs <ul style="list-style-type: none"> <li>ECT, IAT, RPM, TP, MAF, MAP, VPWR</li> </ul> </li> </ul>	2BG
HTR12 (Rear HO2S heater control)	On/Off		<ul style="list-style-type: none"> <li>Ignition switch is turned to the ON position: Off</li> <li>Idle: On</li> </ul>	<ul style="list-style-type: none"> <li>The following PIDs <ul style="list-style-type: none"> <li>ECT, IAT, RPM, TP, MAF, MAP, VPWR</li> </ul> </li> </ul>	2BE
IAT (Intake air temperature)	°C	°F	<ul style="list-style-type: none"> <li>Ignition switch is turned to the ON position: Indicates the IAT</li> </ul>	<ul style="list-style-type: none"> <li>IAT sensor</li> </ul>	1AT
	V		<ul style="list-style-type: none"> <li>IAT is 20 °C {68 °F}: Approx. 2.4 V</li> <li>IAT is 60 °C {140 °F}: Approx. 0.9 V</li> </ul>		
IMRC*6 (Variable tumble solenoid valve)	On/Off		ECT 63 °C {145 °F} or more or engine speed 3,750 rpm or more: On Others: Off	<ul style="list-style-type: none"> <li>Following PIDs: TP, ECT, RPM</li> <li>Variable tumble solenoid valve</li> </ul>	2I
IMTV (Variable intake air control)	On/Off		<ul style="list-style-type: none"> <li>Engine speed is less than 4,750 rpm: On</li> <li>Engine speed is 4,750 rpm or more: Off</li> </ul>	<ul style="list-style-type: none"> <li>The following PIDs <ul style="list-style-type: none"> <li>RPM</li> </ul> </li> </ul>	2J
INGEAR (Gears are engaged)	On/Off		<b>MT</b> <ul style="list-style-type: none"> <li>When the following conditions are satisfied: On <ul style="list-style-type: none"> <li>Other than neutral</li> <li>Clutch pedal released</li> </ul> </li> <li>Except above: Off</li> </ul>	<ul style="list-style-type: none"> <li>CPP switch</li> <li>Neutral switch</li> </ul>	1D,1X
			<b>AT</b> <ul style="list-style-type: none"> <li>Driving range: On</li> <li>Except above: Off</li> </ul>	<ul style="list-style-type: none"> <li>TR switch</li> </ul>	—
IVS (CTP condition)	Idle/Off Idle		<ul style="list-style-type: none"> <li>Idle: Idle</li> <li>Other than idle: Off Idle</li> </ul>	<ul style="list-style-type: none"> <li>The following PIDs <ul style="list-style-type: none"> <li>TP</li> </ul> </li> </ul>	—
KNOCKR (Knocking retard)	°		<ul style="list-style-type: none"> <li>Ignition switch is turned to the ON position: 0 °</li> <li>Idle: 0 °</li> </ul>	<ul style="list-style-type: none"> <li>KS</li> </ul>	2U
LDP_EVAPCP (EVAP system leak detection)			<ul style="list-style-type: none"> <li>Indicates EVAP control system</li> </ul>		

pump detect incorrect purge flow)	A	incorrect purge flow detection value	—	—
LDP_IDL (EVAP system leak detection pump idle current)	A	<ul style="list-style-type: none"> <li>Indicates EVAP system leak detection pump idle current</li> </ul>	—	—
LDP_MON (EVAP system leak detection pump monitoring current)	A	<ul style="list-style-type: none"> <li>Indicates EVAP system leak detection pump monitoring current</li> </ul>	—	—
LDP_REF (EVAP system leak detection pump reference current)	A	<ul style="list-style-type: none"> <li>Indicates EVAP system leak detection pump reference current</li> </ul>	—	—
LDP_SLDV (EVAP system small leak detection value)	A	<ul style="list-style-type: none"> <li>Indicates EVAP system small leak detection value</li> </ul>	—	—
LDP_VSL_FV <sup>*2</sup> (EVAP system very small leak detection fail value)	mA/sec	<ul style="list-style-type: none"> <li>Indicates EVAP system very small leak detection fail value</li> </ul>	—	—
LDP_VSL_SV <sup>*2</sup> (EVAP system very small leak detection safe value)	mA/sec	<ul style="list-style-type: none"> <li>Indicates EVAP system very small leak detection safe value</li> </ul>	—	—
LDP_VSLDV <sup>*2</sup> (EVAP system very small leak detection value)	mA/sec	<ul style="list-style-type: none"> <li>Indicates EVAP system very small leak detection value</li> </ul>	—	—
LOAD (Engine load)	%	<ul style="list-style-type: none"> <li>Idle after warm-up: Approx. 23%</li> </ul>	<ul style="list-style-type: none"> <li>The following PIDs <ul style="list-style-type: none"> <li>MAP, IAT, MAF, RPM</li> </ul> </li> </ul>	—
LONGFT1 (Long term fuel trim)	%	<ul style="list-style-type: none"> <li>Idle after warm-up: Approx. – 15—+15%</li> </ul>	<ul style="list-style-type: none"> <li>The following PIDs <ul style="list-style-type: none"> <li>CPP<sup>*1</sup>, CPP/PNP<sup>*1</sup>, ECT, IAT, RPM, TP, MAF, O2S11, O2S12, MAP, VSS, TR<sup>*2</sup>, BOO, AC_REQ, COLP, VPWR</li> </ul> </li> </ul>	—
MAF (Mass air flow)	g/sec	<ul style="list-style-type: none"> <li>Ignition switch is turned to the ON position: Approx. 0 g/s</li> <li>Idle: Approx. 4.0 g/s</li> </ul>	<ul style="list-style-type: none"> <li>MAF sensor</li> </ul>	1AK
	V	<ul style="list-style-type: none"> <li>Ignition switch is turned to the ON position: Approx. 0.68 V</li> </ul>		

				Idle: Approx. 1.4 V		
MAP  (Manifold absolute pressure)	Pa	psi	Bar	<ul style="list-style-type: none"><li>Ignition switch is turned to the ON position: Indicates the MAP</li></ul>	<ul style="list-style-type: none"><li>MAP sensor</li></ul>	2AG
	V			<ul style="list-style-type: none"><li>Ignition switch is turned to the ON position (at sea level): 4.1 V</li><li>Idle after warm-up: Approx. 1.2 V</li></ul>		
MIL  (Malfunction indicator lamp)	On/Off			<ul style="list-style-type: none"><li>Idle, MIL illuminate: On</li><li>Idle, MIL not illuminate: Off</li></ul>	<ul style="list-style-type: none"><li>MIL</li></ul>	—
MIL_DIS  (Travelled distance since MIL illuminated)	km	mile		Travelled distance since MIL illuminated		—
O2S11  (Front HO2S)	A			<ul style="list-style-type: none"><li>Idle after warm-up: Approx. 0 mA</li></ul>	<ul style="list-style-type: none"><li>Front HO2S</li></ul>	2AD
O2S12  (Rear HO2S)	V			<ul style="list-style-type: none"><li>Idle after warm-up: Alternates between 0 and 1.0 V</li></ul>	<ul style="list-style-type: none"><li>Rear HO2S</li></ul>	2Q
PSP  (PSP switch)	Low/High			<ul style="list-style-type: none"><li>Steering wheel at straight ahead position: Low</li><li>While turning steering wheel: High</li></ul>	<ul style="list-style-type: none"><li>PSP switch</li></ul>	2T
RFCFLAG  (PCM adaptive memory produce verification)	Learnt/ Not Learnt			<ul style="list-style-type: none"><li>Idle (after running PCM adaptive memory procedure drive mode): Learnt</li><li>Right after the negative battery cable is disconnected (before running PCM adaptive memory procedure drive mode): Not Learnt</li></ul>	<ul style="list-style-type: none"><li>Verify after repair procedure</li></ul>	—
RO2FT1  (Rear HO2S fuel trim)	—			<ul style="list-style-type: none"><li>Idle after warm-up: Approx. 0</li></ul>	<ul style="list-style-type: none"><li>The following PIDs<ul style="list-style-type: none"><li>O2S12</li></ul></li></ul>	—
RPM  (Engine speed)	RPM			<ul style="list-style-type: none"><li>When the engine is running: Indicates the engine speed</li></ul>	<ul style="list-style-type: none"><li>CKP sensor</li></ul>	2W
SCCS  (Cruise control switch)	V			<ul style="list-style-type: none"><li>ON OFF switch pressed in: Approx. 0 V</li><li>CANCEL switch pressed in: Approx. 1.1 V</li><li>SET/– switch pressed in: Approx. 3.1 V</li><li>RES/+ switch pressed in: Approx. 4.2 V</li><li>Except above: Approx. 5.0 V</li></ul>	<ul style="list-style-type: none"><li>Cruise control switch</li></ul>	1AQ
				<ul style="list-style-type: none"><li>Ignition switch is turned to the ON position: 0 Step</li></ul>		

SEGRP (EGR control)	—		<ul style="list-style-type: none"> <li>Idle: 0 Step</li> <li>Engine speed is 1,200—4,200 rpm: 0—52 Step</li> </ul>	<ul style="list-style-type: none"> <li>EGR valve</li> </ul>	2K, 2G, 2L, 2H
SEGRP DSD (EGR valve position desired)	%		<ul style="list-style-type: none"> <li>Ignition switch is turned to the ON position: 0%</li> <li>Idle: 0%</li> <li>Engine speed is 1,200—4,200 rpm: 0—100%</li> </ul>	<ul style="list-style-type: none"> <li>The following PIDs <ul style="list-style-type: none"> <li>MAF, TP, ECT, RPM, VSS</li> </ul> </li> </ul>	—
SHRTFT1 (Short term fuel trim (front))	%		<ul style="list-style-type: none"> <li>Idle after warm-up: –25— 25%</li> </ul>	<ul style="list-style-type: none"> <li>The following PIDs <ul style="list-style-type: none"> <li>CPP<sup>*1</sup>, CPP/PNP<sup>*1</sup>, ECT, IAT, RPM, TP, MAF, O2S11, O2S12, MAP, VSS, TR<sup>*2</sup>, BOO, AC_REQ, COLP, VPWR</li> </ul> </li> </ul>	—
SHRTFT12 (Short term fuel trim (rear))	%		<ul style="list-style-type: none"> <li>Idle after warm-up: Approx. 99%</li> </ul>	<ul style="list-style-type: none"> <li>The following PIDs <ul style="list-style-type: none"> <li>CPP<sup>*1</sup>, CPP/PNP<sup>*1</sup>, ECT, IAT, RPM, TP, MAF, O2S11, MAP, VSS, TR<sup>*2</sup>, BOO, AC_REQ, COLP, VPWR</li> </ul> </li> </ul>	—
SPARKADV (Ignition timing)	°		<ul style="list-style-type: none"> <li>Indicates the ignition timing</li> </ul>	<ul style="list-style-type: none"> <li>The following PIDs <ul style="list-style-type: none"> <li>CPP<sup>*1</sup>, CPP/PNP<sup>*1</sup>, ECT, IAT, RPM, TP, MAF, KNOCKR, TR<sup>*2</sup>, BOO, AC_REQ, COLP</li> </ul> </li> </ul>	2S
test (Test mode)	On/Off		<ul style="list-style-type: none"> <li>Test mode On: On</li> <li>Test mode Off: Off</li> </ul>	—	—
TH_M	—		Indicates heat radiation ratio (heat radiation when thermostat is malfunctioning/heat radiation when thermostat is normal) when thermostat monitoring is finished	<ul style="list-style-type: none"> <li>Thermostat</li> </ul>	—
	°C	°F	Indicates engine coolant temperature when thermostat monitoring is finished		
	—		Indicates upper limit of heat radiation ratio (heat radiation when thermostat is malfunctioning/heat		

TH_M_MAX			radiation when thermostat is normal) for thermostat monitoring execution	• Thermostat	—
	°C	°F	Indicates upper limit of engine coolant temperature for thermostat monitoring execution		
TH_M_MIN	—		Indicates lower limit of heat radiation ratio (heat radiation when thermostat is malfunctioning/heat radiation when thermostat is normal) for thermostat monitoring execution	• Thermostat	—
	°C	°F	Indicates lower limit of engine coolant temperature for thermostat monitoring execution		
TIRESIZE (Tire revolution per mile)	rev/mile		• Indicates the tire revolution per a mile		—
TP_REL (Throttle position signal (relative value))	%		<ul style="list-style-type: none"> <li>Accelerator pedal released: Approx. 10%</li> <li>Accelerator pedal depressed: Approx. 81%</li> </ul>	<ul style="list-style-type: none"> <li>The following PIDs <ul style="list-style-type: none"> <li>TP1, TP2</li> </ul> </li> </ul>	—
TP1 (TP sensor No.1)	%		<ul style="list-style-type: none"> <li>Accelerator pedal released: Approx. 10%</li> <li>Accelerator pedal depressed: Approx. 90%</li> </ul>	• TP sensor	2AK
	V		<ul style="list-style-type: none"> <li>Accelerator pedal released: Approx. 0.5 V</li> <li>Accelerator pedal depressed: Approx. 4.5 V</li> </ul>		
TP2 (TP sensor No.2)	%		<ul style="list-style-type: none"> <li>Accelerator pedal released: Approx. 10%</li> <li>Accelerator pedal depressed: Approx. 90%</li> </ul>	• TP sensor	2AL
	V		<ul style="list-style-type: none"> <li>Accelerator pedal released: Approx. 4.5 V</li> <li>Accelerator pedal depressed: 0.5 V</li> </ul>		
TPCT (TP sensor voltage at CTP)	V		• Ignition switch is turned to the ON position: Approx. 0.5 V	<ul style="list-style-type: none"> <li>The following PIDs <ul style="list-style-type: none"> <li>TP1, TP2</li> </ul> </li> </ul>	—
VPWR (Battery positive voltage)	V		• Indicates the battery voltage	• Battery	1BA
VSS (Vehicle speed)	KPH	mph	• Vehicle running: Indicates the vehicle speed	<ul style="list-style-type: none"> <li>ABS, DSC HU/CM<sup>*3</sup></li> <li>VSS<sup>*4</sup></li> <li>TCM<sup>*5</sup></li> </ul>	2O <sup>*4</sup>
					1AM <sup>*3, 5</sup> , 1AI <sup>*3, 5</sup>
				• The following PIDs	



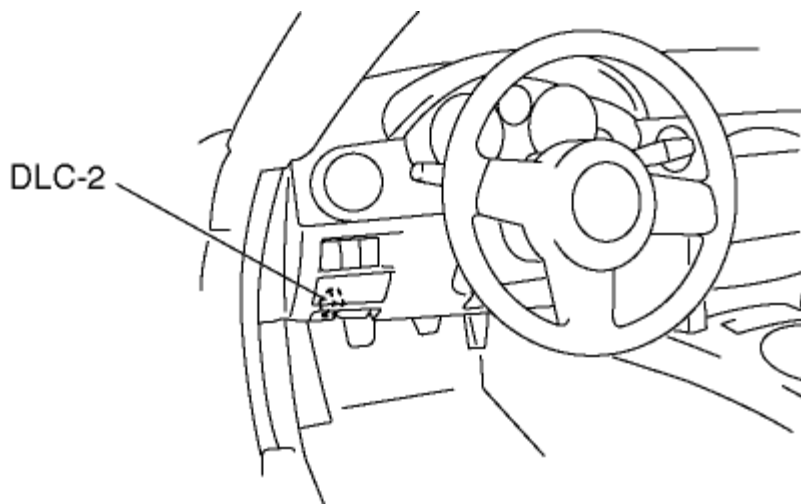
VT ACT1 (Actual valve timing)	°	<ul style="list-style-type: none"><li>• Idle: Approx. 0 °</li><li>• Racing: 0—25 °</li></ul>	<ul style="list-style-type: none"><li>▪ ECT, RPM, TP, MAF</li></ul> <ul style="list-style-type: none"><li>• OCV</li></ul>	2E
VT DIFF1 (Difference between target valve timing and actual valve timing)	°	<ul style="list-style-type: none"><li>• Idle: 0 °</li></ul>	<ul style="list-style-type: none"><li>• The following PIDs<ul style="list-style-type: none"><li>▪ ECT, RPM, TP, MAF</li></ul></li><li>• OCV</li></ul>	—
VT DUTY1 (OCV control)	%	<ul style="list-style-type: none"><li>• Idle: Approx. 10%</li></ul>	<ul style="list-style-type: none"><li>• The following PIDs<ul style="list-style-type: none"><li>▪ ECT, RPM, TP, MAF</li></ul></li></ul>	2E
VTC*6 (Variable tumble shutter valve control)	On/Off	Indicates the condition of the variable tumble shutter valve switch	<ul style="list-style-type: none"><li>• Following PIDs: IMRC</li><li>• Variable tumble shutter valve switch</li></ul>	2AE

- \*1
- MT
- \*2
- California emission regulation applicable model
- \*3
- With ABS, DSC HU/CM
- \*4
- MT without ABS/DSC
- \*5
- AT without ABS/DSC
- \*6
- AT

## 2008 - MX-5 - Engine

### PCM CONFIGURATION [LF]

1. Connect the M-MDS to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  - Select the "Module Programming".
- When using the PDS (Pocket PC)
  - Select the "Programming".
  - Select the "Module Programming".

3. Then, select the "Programmable Module Installation", "PCM" from the screen menu.

4. Retrieve DTCs by the M-MDS, then verify that there is no DTC present.

- If a DTC is present, perform the applicable DTC inspection.

## 2008 - MX-5 - Engine

### THROTTLE POSITION (TP) SENSOR INSPECTION [LF]

#### CAUTION:

- This inspection procedure cannot be completed correctly if the accelerator pedal position sensor has a malfunction. Before performing this procedure, verify that any one of the DTCs related to the accelerator pedal position sensor is not detected.

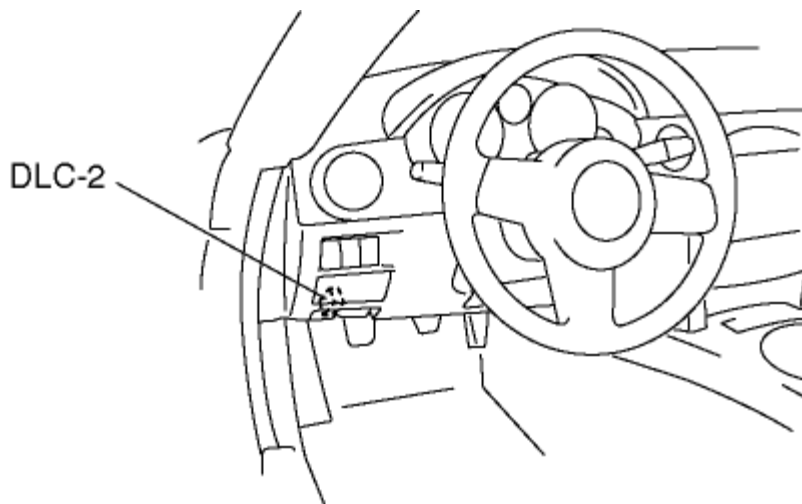
#### NOTE:

- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See [HOW TO USE THIS MANUAL.](#))

1. Verify that no DTC related to APP sensor has been detected.

- If any DTCs related to APP sensor have been detected, perform the DTC inspection. (See [DTC TABLE \[LF\]](#).)

2. Connect the M-MDS to the DLC 2.



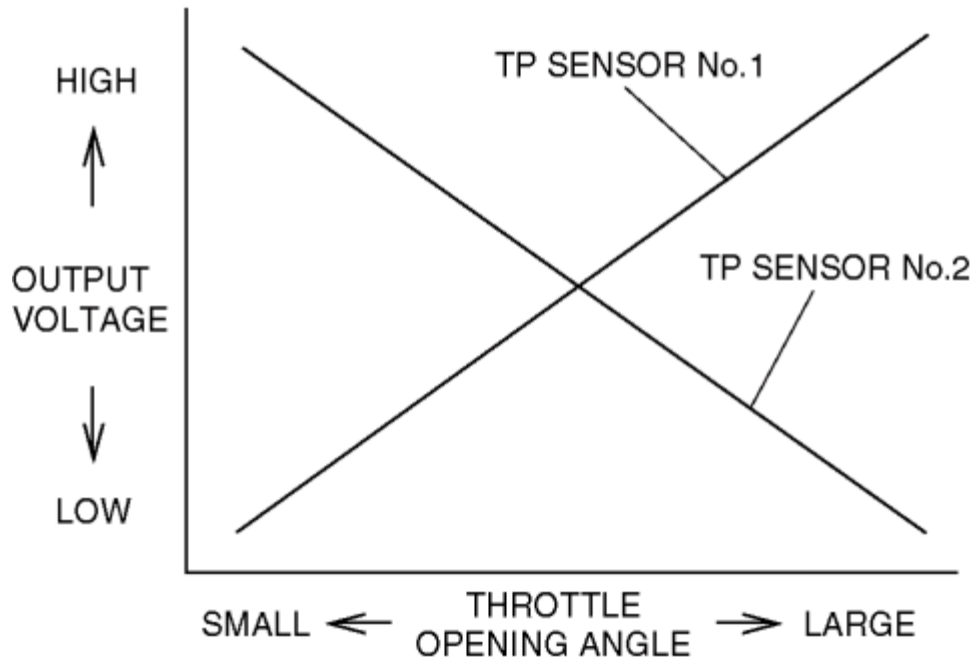
3. Turn the ignition switch to the ON position.

4. Select TP1 or TP2 PID (percentage) on the M-MDS.

5. Verify that the TP1 or TP2 PID is within the specification when the accelerator pedal not depressed. (See [PCM INSPECTION \[LF\]](#).)

6. Operate the accelerator pedal and verify that the TP1 or TP2 PID (percentage) changes as shown in the following graph.

## THE CHARACTERISTICS OF TP SENSOR (REFERENCE)

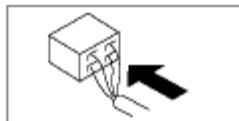
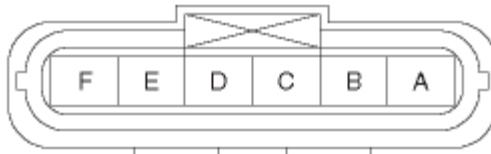


- If not verified, perform the "Circuit Open/Short Inspection".
  - If there is no open or short circuit, replace the throttle body. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)

### Circuit Open/Short Inspection

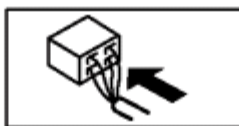
1. Disconnect the PCM connector. (See [PCM REMOVAL/INSTALLATION \[LF\]](#).)
2. Disconnect the throttle body connector.
3. Inspect the following wiring harnesses for an open or short circuit. (Continuity inspection)

#### THROTTLE BODY WIRING HARNESS-SIDE CONNECTOR



## PCM WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



### Open circuit

- If there is no continuity in the following wiring harnesses, there is an open circuit. Repair or replace the wiring harness.
  - Throttle body terminal C and PCM terminal 2AP
  - Throttle body terminal D and PCM terminal 2AL
  - Throttle body terminal E and PCM terminal 2AO
  - Throttle body terminal F and PCM terminal 2AK

### Short circuit

- If there is continuity in the following wiring harnesses, there is a short circuit. Repair or replace the wiring harness.
  - Throttle body terminal C and power supply
  - Throttle body terminal D and body ground
  - Throttle body terminal D and power supply
  - Throttle body terminal E and body ground
  - Throttle body terminal F and body ground
  - Throttle body terminal F and power supply

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## 2008 - MX-5 - Engine

### KNOCK SENSOR (KS) INSPECTION [LF]

#### NOTE:

- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See [HOW TO USE THIS MANUAL.](#))

#### Resistance Inspection

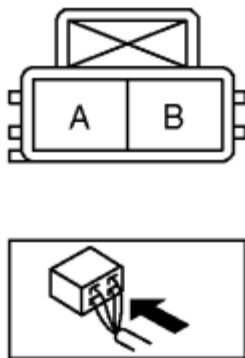
1. Remove the battery cover.
2. Remove the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Disconnect the KS connector.
4. Measure resistance between KS terminals A and B.
  - If not within the specification, replace the KS. (See [KNOCK SENSOR \(KS\) REMOVAL/INSTALLATION \[LF\]](#).)
  - If the monitor item status/specification (reference) is not within the specification, even though the KS resistance is within the specification, perform the "Circuit Open/Short Inspection".

#### KS resistance

- Approx. 4.87 megohms

#### Circuit Open/Short Inspection

KS  
HARNESS SIDE CONNECTOR



1. Disconnect the PCM connector.
2. Inspect the following wiring harnesses for an open or short circuit. (Continuity inspection)

### Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - KS terminal A and PCM terminal 2U
  - KS terminal B and PCM terminal 2V

### Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - KS terminal A and power supply
  - KS terminal A and body ground
  - KS terminal B and power supply
  - KS terminal B and body ground

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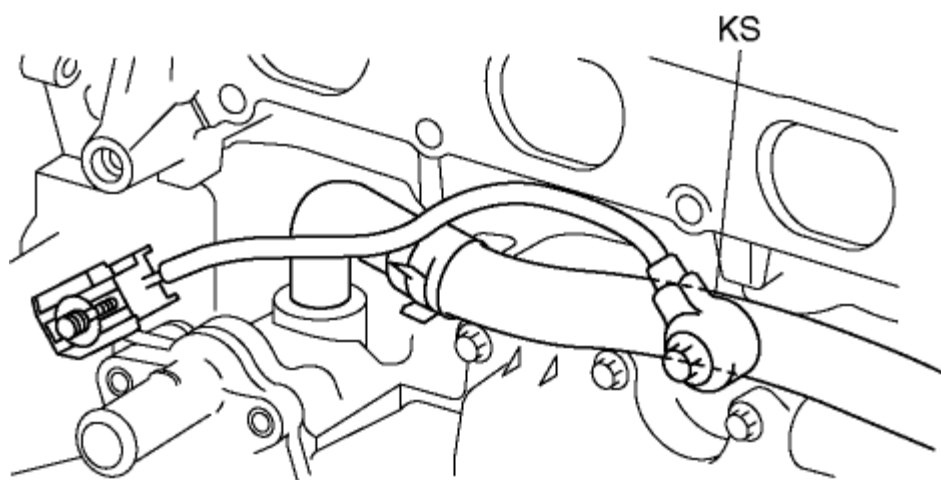
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## 2008 - MX-5 - Engine

### **KNOCK SENSOR (KS) REMOVAL/INSTALLATION [LF]**

1. Remove the battery cover.
2. Remove the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the dynamic chamber. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
4. Disconnect the KS connector.
5. Remove the KS installation bolt, then remove the KS.



6. Install in the reverse order of removal.

#### **KS tightening torque**

- 16—24 N·m { 1.7—2.4 kgf·m, 12—17 ft·lbf }



2008 - MX-5 - Engine

POWER STEERING PRESSURE (PSP) SWITCH INSPECTION [LF]

NOTE:

- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See [HOW TO USE THIS MANUAL.](#))

Continuity Inspection

1. Inspect the following items:
  - Power steering fluid amount (See [POWER STEERING FLUID INSPECTION.](#))
  - Power steering-related inspection (See [STEERING LOCATION INDEX.](#))
2. Disconnect the PSP switch connector.
3. Start the engine.
4. Verify that the continuity between PSP switch terminal A and body ground is as indicated in the table.
  - If not as indicated in the table, replace the CPP switch. (See [POWER STEERING OIL PUMP DISASSEMBLY/ASSEMBLY.](#))
  - If the monitor item condition/specification (reference) is not within the specification, even though there is no malfunction, perform the “Circuit Open/Short Inspection”.

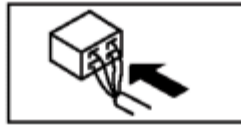
○ — ○ : Continuity

Condition	Terminal A	GND
Steering wheel in straight ahead position		
While turning sttering wheel	○ —	— ○

Circuit Open/Short Inspection

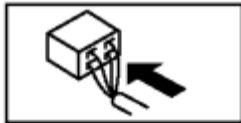
1. Disconnect the PCM connector. (See [PCM REMOVAL/INSTALLATION \[LF\].](#))
2. Inspect the following wiring harness for open or short circuit (continuity Inspection).

## PSP SWITCH WIRING HARNESS-SIDE CONNECTOR



## PCM WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



### Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - PSP switch terminal A and PCM terminal 2T

### Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - PSP switch terminal A and body ground

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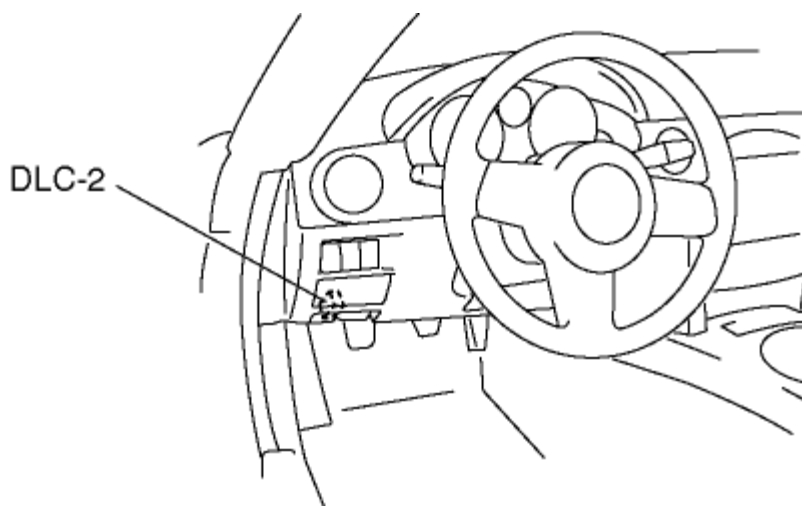
## 2008 - MX-5 - Engine

### ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [LF]

#### NOTE:

- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See [HOW TO USE THIS MANUAL](#).)

1. Connect the M-MDS to the DLC 2.

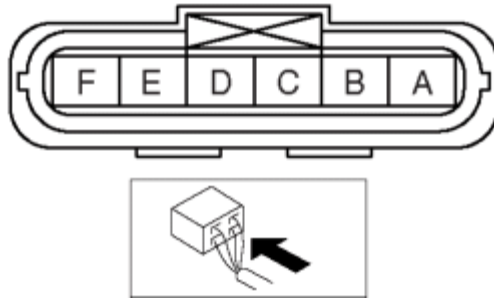


2. Turn the ignition switch to the ON position.
3. Select APP1 and APP2 PID on the M-MDS.
4. Verify that the APP1 and APP2 PID is within the specification when the accelerator pedal not depressed. (See [PCM INSPECTION \[LF\]](#).)

### Circuit Open/Short Inspection

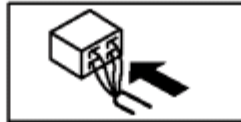
1. Disconnect the PCM connector. (See [PCM REMOVAL/INSTALLATION \[LF\]](#).)
2. Disconnect the APP sensor connector.
3. Inspect the following wiring harnesses for an open or short circuit. (Continuity inspection)

## APP SENSOR WIRING HARNESS-SIDE



## PCM WIRING HARNESS-SIDE CONNECTOR

1BE	1BA	1AW	1AS	1AO	1AK	1AG	1AC	1Y	1U	1Q	1M	1I	1E	1A
1BF	1BB	1AX	1AT	1AP	1AL	1AH	1AD	1Z	1V	1R	1N	1J	1F	1B
1BG	1BC	1AY	1AU	1AQ	1AM	1AI	1AE	1AA	1W	1S	1O	1K	1G	1C
1BH	1BD	1AZ	1AV	1AR	1AN	1AJ	1AF	1AB	1X	1T	1P	1L	1H	1D



### Open circuit

- If there is no continuity in the following wiring harnesses, there is an open circuit. Repair or replace the wiring harness.
  - APP sensor terminal A and PCM terminal 1AJ
  - APP sensor terminal B and PCM terminal 1AV
  - APP sensor terminal C and PCM terminal 1AP
  - APP sensor terminal D and PCM terminal 1AL
  - APP sensor terminal E and PCM terminal 1AS
  - APP sensor terminal F and PCM terminal 1AO

### Short circuit

- If there is continuity in the following wiring harnesses, there is a short circuit. Repair or replace the wiring harness.
  - APP sensor terminal A and body ground
  - APP sensor terminal B and power supply
  - APP sensor terminal C and body ground
  - APP sensor terminal C and power supply

- APP sensor terminal D and body ground
- APP sensor terminal E and power supply
- APP sensor terminal F and body ground
- APP sensor terminal F and power supply

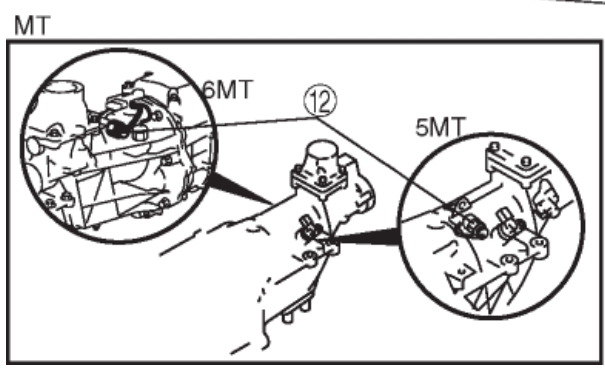
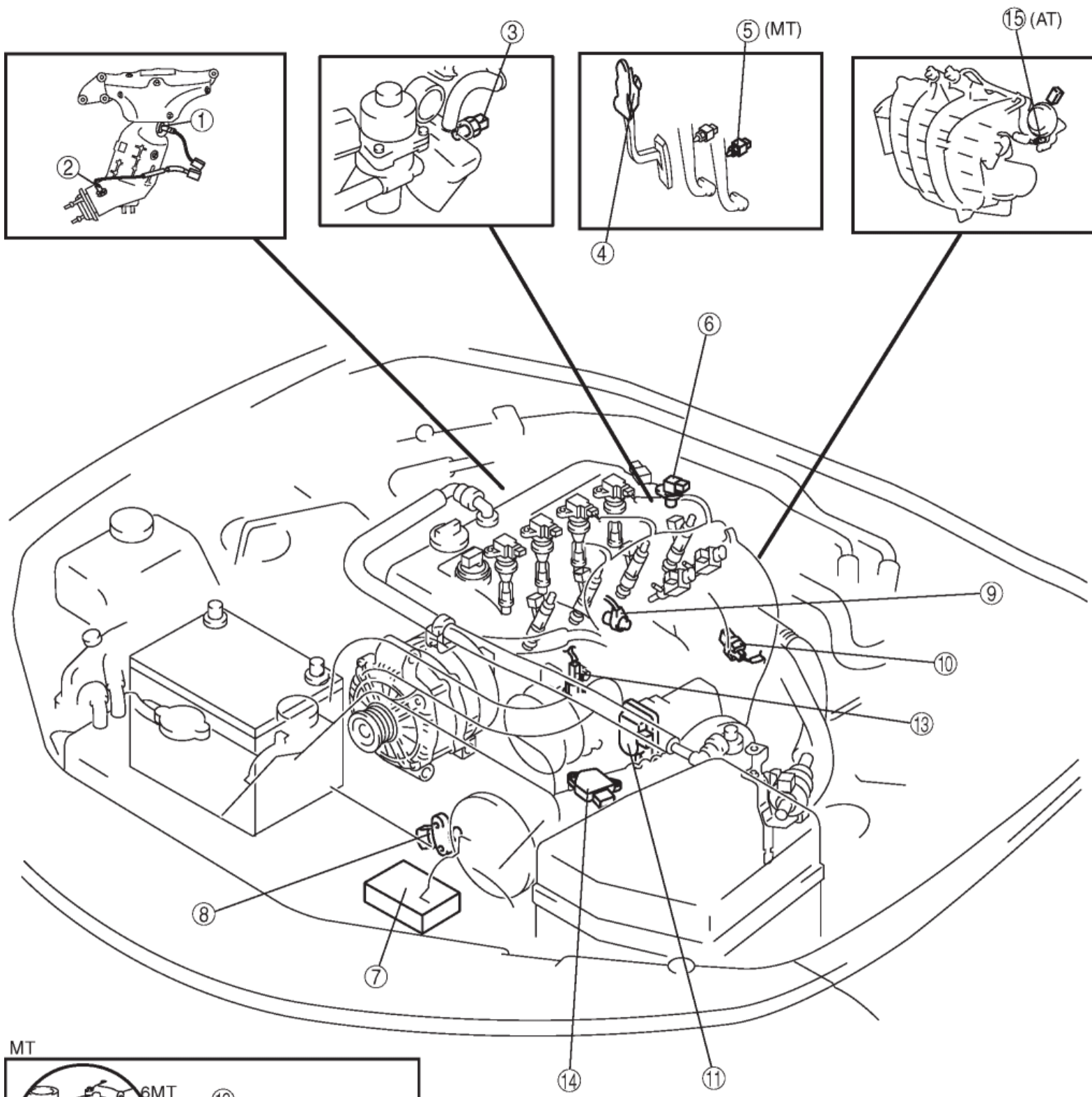
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**CONTROL SYSTEM LOCATION INDEX [LF]**



1	<p>Front HO2S</p> <p>(See <a href="#">FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF].</a>)</p> <p>(See <a href="#">FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF].</a>)</p>
2	<p>Rear HO2S</p> <p>(See <a href="#">REAR HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF].</a>)</p> <p>(See <a href="#">REAR HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF].</a>)</p>
3	<p>ECT sensor</p> <p>(See <a href="#">ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [LF].</a>)</p> <p>(See <a href="#">ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [LF].</a>)</p>
4	<p>APP sensor</p> <p>(See <a href="#">ACCELERATOR PEDAL POSITION (APP) SENSOR INSPECTION [LF].</a>)</p>
5	<p>CPP switch</p> <p>(See <a href="#">CLUTCH PEDAL POSITION (CPP) SWITCH INSPECTION [LF].</a>)</p>
6	<p>CMP sensor</p> <p>(See <a href="#">CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION [LF].</a>)</p> <p>(See <a href="#">CAMSHAFT POSITION (CMP) SENSOR INSPECTION [LF].</a>)</p>
7	<p>PCM (built into BARO sensor)</p> <p>(See <a href="#">PCM REMOVAL/INSTALLATION [LF].</a>)</p> <p>(See <a href="#">PCM INSPECTION [LF].</a>)</p> <p>(See <a href="#">PCM CONFIGURATION [LF].</a>)</p> <p>(See <a href="#">BAROMETRIC PRESSURE (BARO) SENSOR INSPECTION [LF].</a>)</p>
8	<p>CKP sensor</p> <p>(See <a href="#">CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION [LF].</a>)</p> <p>(See <a href="#">CRANKSHAFT POSITION (CKP) SENSOR INSPECTION [LF].</a>)</p>
9	<p>KS</p> <p>(See <a href="#">KNOCK SENSOR (KS) REMOVAL/INSTALLATION [LF].</a>)</p> <p>(See <a href="#">KNOCK SENSOR (KS) INSPECTION [LF].</a>)</p>
10	<p>MAP sensor</p> <p>(See <a href="#">MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR REMOVAL/INSTALLATION [LF].</a>)</p> <p>(See <a href="#">MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR INSPECTION [LF].</a>)</p>
11	<p>TP sensor</p> <p>(See <a href="#">THROTTLE POSITION (TP) SENSOR INSPECTION [LF].</a>)</p>
12	<p>Neutral switch</p> <p>(See <a href="#">NEUTRAL SWITCH INSPECTION [LF].</a>)</p>
13	<p>PSP switch</p> <p>(See <a href="#">POWER STEERING PRESSURE (PSP) SWITCH INSPECTION [LF].</a>)</p>

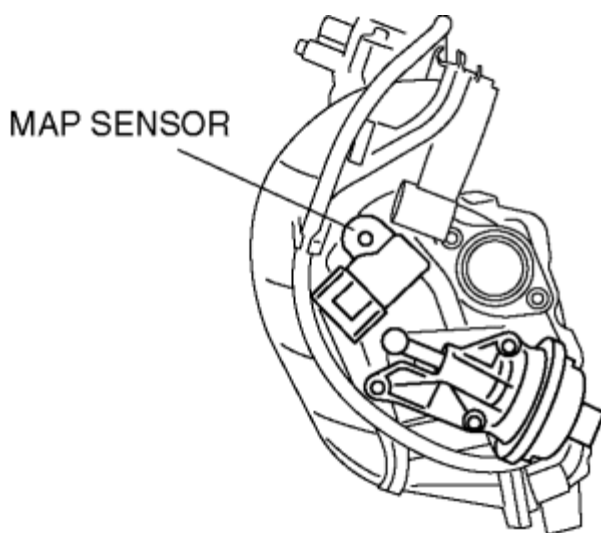


14	MAF/IAT sensor  (See <a href="#">MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION [LF].</a> )  (See <a href="#">MASS AIR FLOW (MAF) SENSOR INSPECTION [LF].</a> )  (See <a href="#">INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION [LF].</a> )
15	Variable tumble shutter valve switch  (See <a href="#">VARIABLE TUMBLE SHUTTER VALVE SWITCH REMOVAL/INSTALLATION [LF].</a> )  (See <a href="#">VARIABLE TUMBLE SHUTTER VALVE SWITCH INSPECTION [LF].</a> )

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### MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR REMOVAL/INSTALLATION [LF]

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#))
3. Remove the dynamic chamber. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
4. Remove the MAP sensor.



5. Install in the reverse order of removal.
  - MAP sensor tightening torque
  - 2.7—3.7 N·m {28—37 kgf·cm, 24—32 in·lbf}

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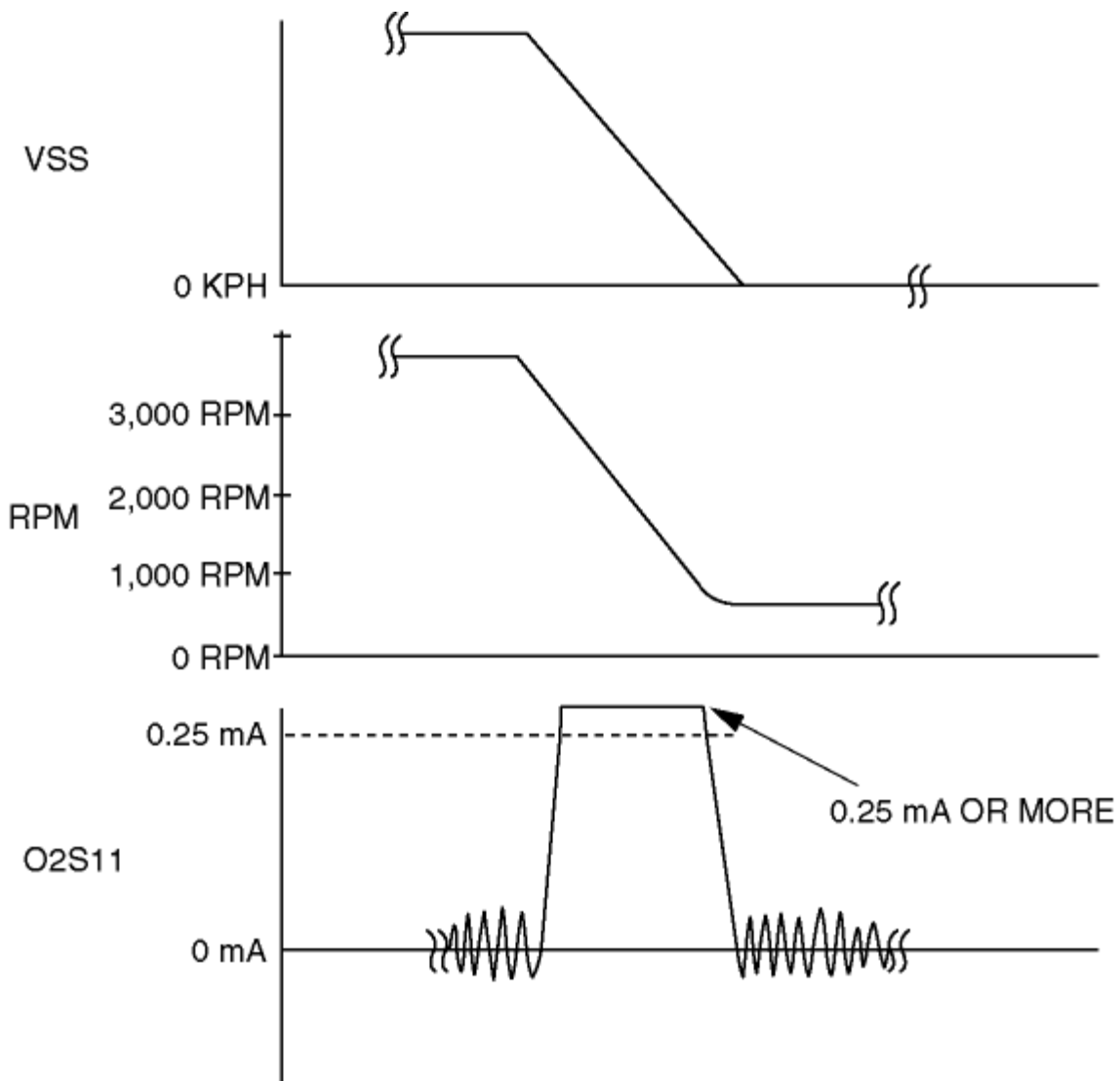
### FRONT HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF]

#### NOTE:

- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See [HOW TO USE THIS MANUAL.](#))

#### Front HO2S Current Inspection

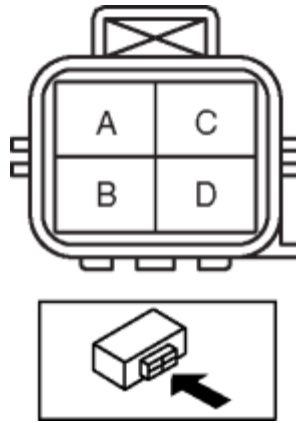
1. Warm up the engine to normal operating temperature.
2. Using the M-MDS, monitor the following:
  - Vehicle speed (PID: VSS)
  - Engine speed (PID: RPM)
  - Front HO2S current (PID: O2S11)
3. Drive the vehicle and decelerate the engine speed by releasing the accelerator pedal fully when the engine speed is **3,000 rpm or more**.
4. Verify that the front HO2S current (PID: O2S11) is **0.25 mA or more** while decelerating as shown in the figure.



- If not within the specification, inspect the front HO2S for an open or short circuit. (See [FRONT HEATED OXYGEN SENSOR \(HO2S\) INSPECTION \[LF\]](#).) Then if there is no malfunction in the wiring harness, replace the front HO2S. (See [FRONT HEATED OXYGEN SENSOR \(HO2S\) REMOVAL/INSTALLATION \[LF\]](#).)

### Front HO2S Heater Resistance Inspection

1. Disconnect the front HO2S connector.
2. Measure the resistance between front HO2S terminals C and D.



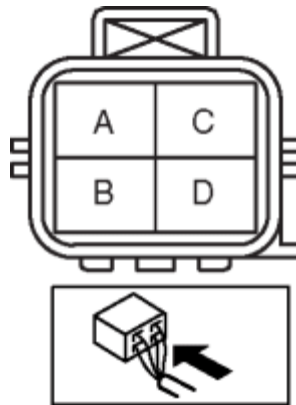
- If not within the specification, replace the front HO2S. (See [FRONT HEATED OXYGEN SENSOR \(HO2S\) REMOVAL/INSTALLATION \[LF\]](#).)

#### Front HO2S heater resistance

- 1—10 ohms

#### Front HO2S Circuit Open/Short Inspection

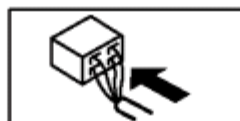
1. Disconnect the PCM connector. (See [PCM REMOVAL/INSTALLATION \[LF\]](#).)
2. Disconnect the front HO2S connector.
3. Inspect the following wiring harnesses for an open or short circuit. (Continuity inspection)



PCM

#### WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



Open circuit

- If there is no continuity in the following wiring harnesses, there is an open circuit. Repair or replace the wiring harness.
  - Front HO2S terminal A and PCM terminal 2AD
  - Front HO2S terminal B and PCM terminal 2Z
  - Front HO2S terminal C ignition relay
  - Front HO2S terminal D and PCM terminal 2BG

### **Short circuit**

- If there is continuity in the following wiring harnesses, there is a short circuit. Repair or replace the wiring harness.
  - Front HO2S terminal A and power supply
  - Front HO2S terminal A and body ground
  - Front HO2S terminal B and power supply
  - Front HO2S terminal B and body ground
  - Front HO2S terminal C and body ground
  - Front HO2S terminal D and power supply
  - Front HO2S terminal D and body ground

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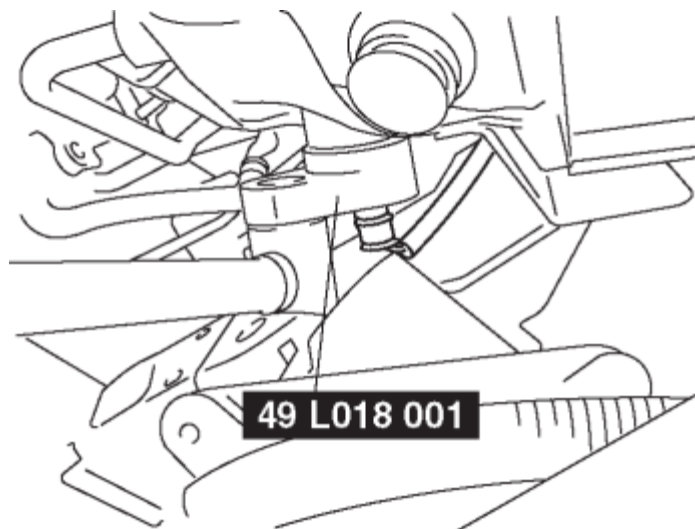
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### FRONT HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Install the **SST** to the front HO2S.



4. Remove the front HO2S.
5. Install in the reverse order of removal.
  - Front HO2S tightening torque
  - 29—49 N·m {3.0—4.9 kgf·m, 22—35 ft·lbf}

## 2008 - MX-5 - Engine

### REAR HEATED OXYGEN SENSOR (HO2S) INSPECTION [LF]

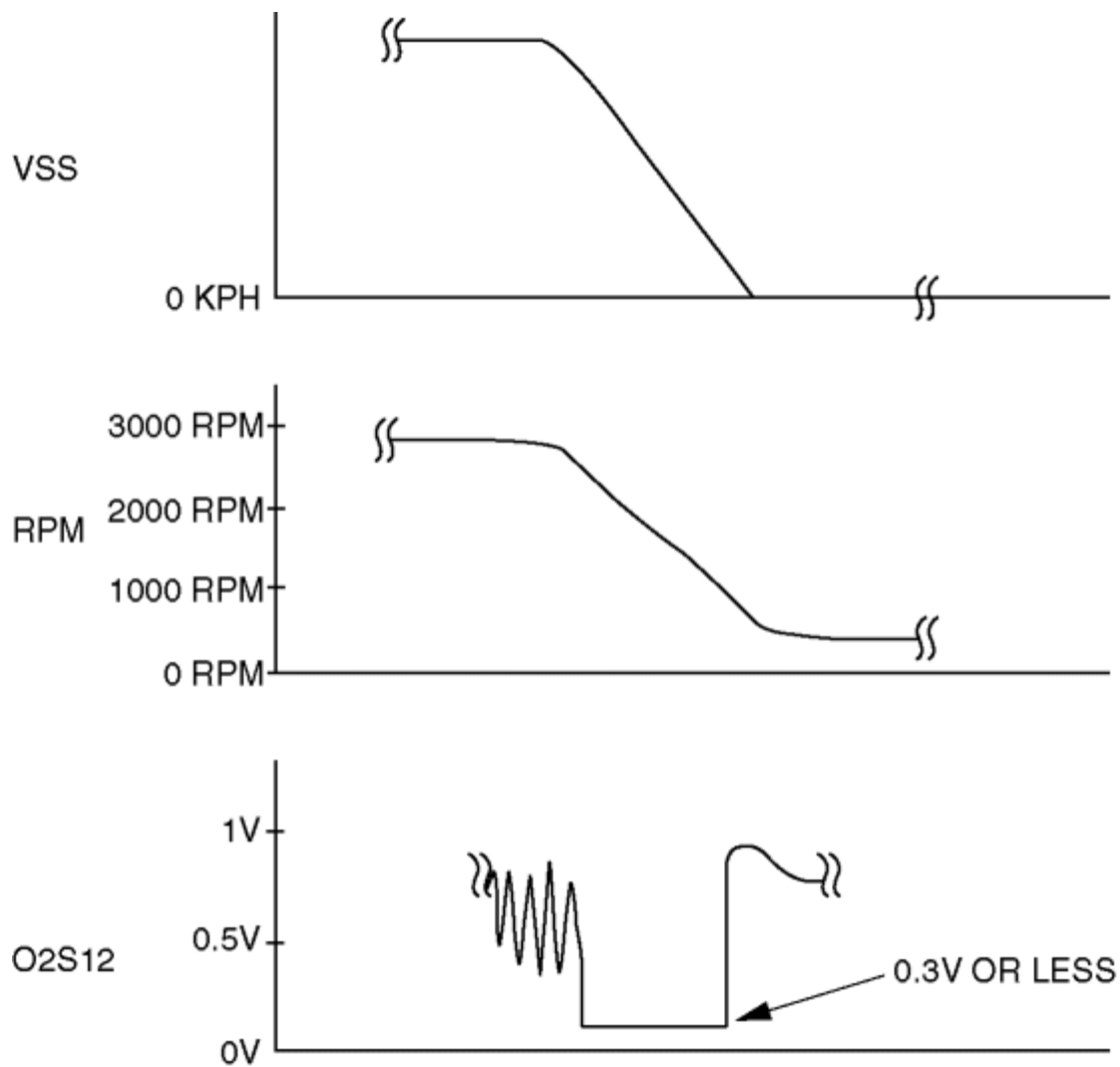
#### NOTE:

- Before performing the following inspection, make sure to follow the procedure as indicated in the troubleshooting flowchart. (See [HOW TO USE THIS MANUAL.](#))

#### Rear HO2S Voltage Inspection

1. Warm up the engine to normal operating temperature.
2. Using the M-MDS, monitor the following:
  - Vehicle speed (PID: VSS)
  - Engine speed (PID: RPM)
  - Rear HO2S voltage (PID: O2S12)
3. Drive the vehicle and decelerate the engine speed by releasing the accelerator pedal fully when the engine speed is **3,000 rpm or more**.
4. Verify that the rear HO2S outputs a voltage of **0.6 V or more**, one time or more, then verify that the rear HO2S voltage (PID: O2S12) is **0.3 V or less** while decelerating as shown in the figure.

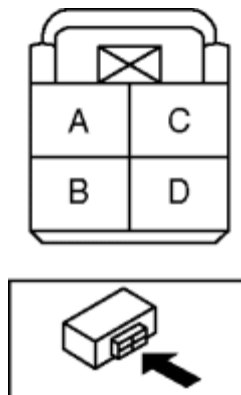




- If not within the specification, inspect the rear HO2S for an open or short circuit. (See [REAR HEATED OXYGEN SENSOR \(HO2S\) INSPECTION \[LF\]](#).) Then if there is no malfunction in the wiring harness, replace the rear HO2S. (See [REAR HEATED OXYGEN SENSOR \(HO2S\) REMOVAL/INSTALLATION \[LF\]](#).)

### Rear HO2S Heater Resistance Inspection

1. Disconnect the rear HO2S connector.
2. Measure the rear HO2S resistance between terminals C and D.



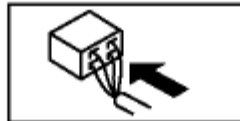
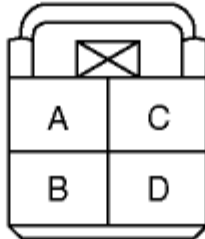
- If not within the specification, replace the rear HO2S. (See **REAR HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]**.)

#### Rear HO2S heater resistance

- 2—50 ohms

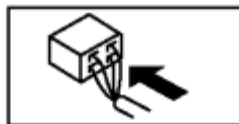
#### Rear HO2S Circuit Open/Short Inspection

##### REAR HO2S WIRING HARNESS-SIDE CONNECTOR



##### PCM WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



1. Disconnect the PCM connector.
2. Disconnect the rear HO2S connector.
3. Inspect the following wiring harnesses for an open or short circuit. (Continuity inspection)

#### Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - Rear HO2S terminal A and PCM terminal 2Q
  - Rear HO2S terminal B and PCM terminal 2BH
  - Rear HO2S terminal C and ignition relay

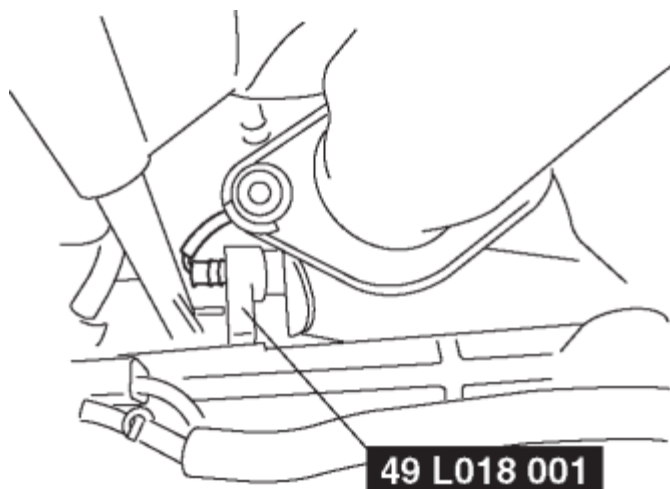
### **Short circuit**

- If there is continuity in the following wiring harnesses, there is a short circuit. Repair or replace the wiring harness.
  - Rear HO2S terminal A and power supply
  - Rear HO2S terminal A and body ground
  - Rear HO2S terminal B and power supply
  - Rear HO2S terminal B and body ground
  - Rear HO2S terminal C and body ground
  - Rear HO2S terminal D and power supply
  - Rear HO2S terminal D and body ground

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### REAR HEATED OXYGEN SENSOR (HO2S) REMOVAL/INSTALLATION [LF]

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Install the **SST** to the rear HO2S.

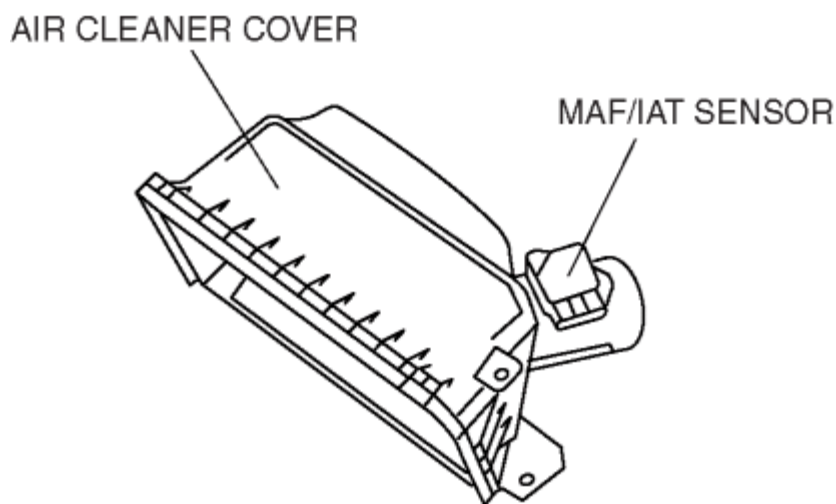


4. Remove the rear HO2S.
5. Install in the reverse order of removal.
  - Rear HO2S tightening torque
  - 29—49 N·m { 3.0—4.9 kgf·m, 22—35 ft·lbf }

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### MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR REMOVAL/INSTALLATION [LF]

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Disconnect MAF/IAT sensor connector.
4. Remove the MAF/IAT sensor.



5. Install in the reverse order of removal.
  - MAF/IAT sensor tightening torque
  - 0.55—0.82 N·m {5.7—8.3 kgf·cm, 4.9—7.2 in·lbf}

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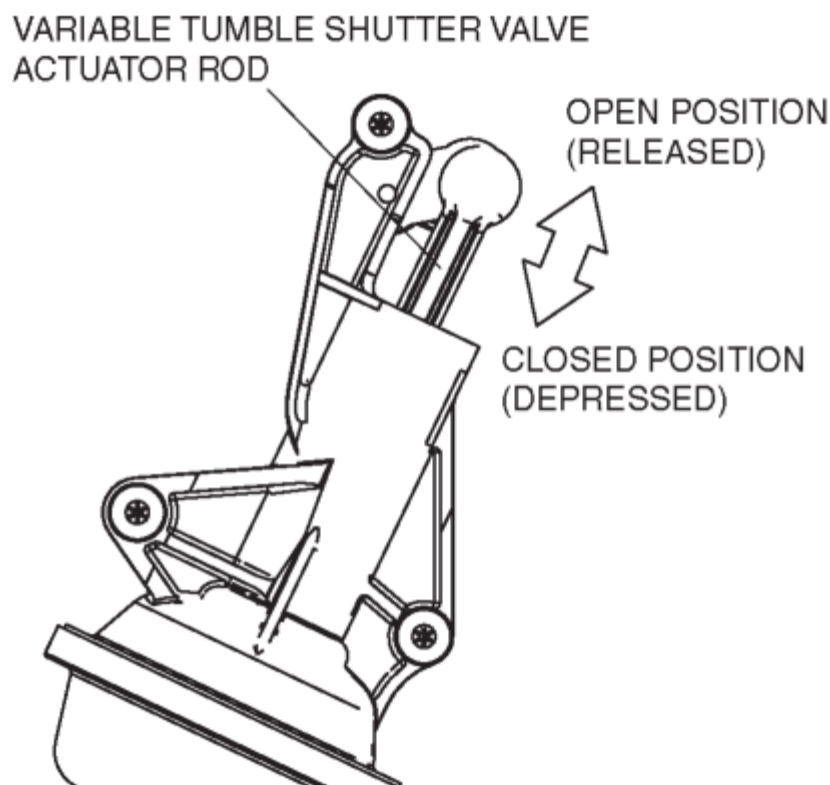
### VARIABLE TUMBLE SHUTTER VALVE SWITCH INSPECTION [LF]

#### NOTE:

- Perform the following inspection only when directed.

#### Voltage Inspection

1. Turn the ignition switch to the ON position (Engine off).
2. Verify that the PCM terminal 2AE voltage is as shown in the following table when the variable tumble shutter valve actuator rod is depressed and released by hand.



## PCM WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



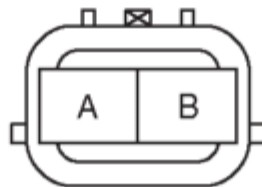
- If not as specified, perform the "Circuit Open/Short Inspection".
  - If there is no open or short circuit, replace the intake manifold.  
(See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)

### Variable tumble shutter valve switch output voltage

Condition	PCM terminal 2AE
Released (Open position)	B+
Depressed (Closed position)	Below 1.0

### Circuit Open/Short Inspection

#### VARIABLE TUMBLE SHUTTER VALVE SWITCH WIRING HARNESS-SIDE CONNECTOR



## PCM WIRING HARNESS-SIDE CONNECTOR

2BE	2BA	2AW	2AS	2AO	2AK	2AG	2AC	2Y	2U	2Q	2M	2I	2E	2A
2BF	2BB	2AX	2AT	2AP	2AL	2AH	2AD	2Z	2V	2R	2N	2J	2F	2B
2BG	2BC	2AY	2AU	2AQ	2AM	2AI	2AE	2AA	2W	2S	2O	2K	2G	2C
2BH	2BD	2AZ	2AV	2AR	2AN	2AJ	2AF	2AB	2X	2T	2P	2L	2H	2D



1. Disconnect the PCM connector.
2. Inspect the following harness for an open or short wiring. (Continuity inspection)

### Open circuit

- If there is no continuity, there is an open circuit. Repair or replace the wiring harness.
  - Variable tumble shutter valve switch terminal A and PCM terminal 2AE
  - Variable tumble shutter valve switch terminal B and body ground

### Short circuit

- If there is continuity, there is a short circuit. Repair or replace the wiring harness.
  - Variable tumble shutter valve switch terminal A and body ground
  - Variable tumble shutter valve switch terminal B and power supply

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### VARIABLE TUMBLE SHUTTER VALVE SWITCH REMOVAL/INSTALLATION [LF]

#### CAUTION:

- The characteristics of the variable tumble shutter valve switch are adjusted before shipment. Therefore, do not remove it from the intake manifold. When replacing the variable tumble shutter valve switch, replace it together with a new intake manifold as a single unit. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)

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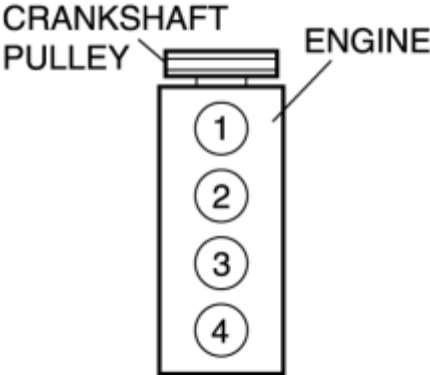
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## 2008 - MX-5 - Engine

### ENGINE TECHNICAL DATA [LF]

Item	Specification
Valve clearance [Engine cold]	IN: 0.22—0.28 mm {0.0087—0.0110 in} EX: 0.27—0.33 mm {0.0107—0.0129 in}
Compression	Standard: 1,720 kPa {17.5391 kgf/cm <sup>2</sup> , 249.465 psi} [300 rpm] Minimum: 1,204 kPa {12.277 kgf/cm <sup>2</sup> , 174.58 psi} [300 rpm] Maximum difference between cylinders: 196.1 kPa {2.0 kgf/cm <sup>2</sup> , 28.5 psi}
Front oil seal press-in amount	0—1.0 mm {0—0.039 in}
Cylinder Head Bolt Length L	145.2—145.8 mm {5.72—5.74 in}
Cylinder Head Bolt Maximum	146.5 mm {5.77 in}
Oil control valve resistance	6.9—7.9 ohms [20°C {68°F}]
Ignition timing	Approx. BTDC 8 °
Idle speed	No load: 670—770 rpm (MT), 700—800 rpm (AT) Electrical loads (38—48 A): 00—800 rpm (AT) Electrical loads (more than 48 A): 800—900 rpm P/S ON: 700—800 rpm (MT), 750—850 rpm (AT) A/C ON: 825—925 rpm (MT), 775—875 rpm (AT)
Idle mixture	HC concentration: Within the regulation CO concentration: Within the regulation
Oil pressure (reference value) [oil	337—591 kPa {3.44—6.03 kgf/cm <sup>2</sup> , 49.0—85.8 psi} min




temperature: 100 °C {212 °F}}	[3,000 rpm]
Engine oil capacity (approx. quantity) (AT, 5MT)	Oil replacement: 4.05 L {4.28 US qt, 3.56 Imp qt} Oil and oil filter replacement: 4.45 L {4.70 US qt, 3.92 Imp qt} Total (dry engine): 4.75 L {5.02 US qt, 4.18 Imp qt}
Engine oil capacity (approx. quantity) (6MT)	Oil replacement: 4.05 L {4.28 US qt, 3.56 Imp qt} Oil and oil filter replacement: 4.55 L {4.81 US qt, 4.00 Imp qt} Total (dry engine): 4.85 L {5.12 US qt, 4.27 Imp qt}
Engine coolant capacity (approx. quantity)	7.5 L {7.9 US qt, 6.6 Imp qt}
Cooling system cap valve opening pressure	93.2—122.6 kPa {0.95—1.25 kgf/cm <sup>2</sup> , 13.5—17.8 psi}
Thermostat initial-opening temperature	80—84 °C {176—183 °F}
Thermostat full-open temperature	97 °C {207 °F}
Thermostat full-open lift	More than 8.0 mm {0.31 in}
Cooling fan motor current	High: 9.0—12.0 A Middle: 6.4—9.4 A Low: 4.8—7.8 A
Fuel line pressure	350—410 kPa {3.57—4.18 kgf/cm <sup>2</sup> , 50.8—59.4 psi}
Fuel hold pressure	250 kPa {2.55 kgf/cm <sup>2</sup> , 36.2 psi} or more
Fuel injector resistance	11.4—12.6 ohms [20 °C {68 °F}]
Fuel injector leakage amount	Less than 1 drop/2 min
Fuel injection volume	204—216 ml {204—216 cc, 12.5—13.1 cu in}/min
Battery electrolyte specific gravity [20 °C {68 °F}]	1.22—1.29
Battery load test current	46B24L (36): 135 A
Battery parasitic draw (When the ignition is	Vehicles with immobilizer system: 25—45 mA

off (key is removed), all doors and the hood are closed.)	Vehicles without immobilizer system: 30 mA or less
Battery slow charge current	46B24L (36): 3.5—4.5 A
Battery quick charge current [30 min.]	46B24L (36): 25 A
Generator standard voltage [IG-ON]	Terminal B: B+ Terminal P: Approx. 1 V or less Terminal D: Approx. 0 V
Generator standard voltage [Idle, 20 °C {68 °F}]	Terminal B: 13—15 V Terminal P: Approx. 3—8 V Terminal D: Turn the electrical loads (headlights, blower motor, rear window defroster) on and verify that the voltage reading increases.
Generator generated current minimum value	70% of the nominal output current (nominal output current: 100 A) [ambient temp. 20 °C {68 °F}, voltage 13.0—15.0 V, both engine and generator are hot]
Generator rotor resistance (between slip rings) [20 °C {68 °F}]	2.0—2.3 ohm
Generator brush length	Standard: 22.5 mm {0.89 in} Minimum: 5.0 mm {0.20 in}
Generator brush spring force	Standard: 4.1—5.3 N {0.42—0.54 kgf, 0.92—1.19 lbf} Minimum: 1.7 N {0.17 kgf, 0.38 lbf}
Firing order	1-3-4-2 (all cylinders independent firing)
	<p>CYLINDER No.</p>  <p>CRANKSHAFT PULLEY ENGINE</p>

Spark plug type	L3G2 18 110, L3Y1 18 110
Spark plug gap	1.25—1.35 mm {0.050—0.053 in}
Spark plug resistance [25 °C {77 °F}]	3.0—7.5 kilohms
Starter no load test voltage	11 V
Starter no load test current	90 A or less
Starter pinion gap	0.5—2.0 mm {0.02—0.07 in}
Starter armature runout	0.1 mm {0.004 in} max.
Starter commutator diameter	Standard: 29.4 mm {1.16 in} Minimum: 28.8 mm {1.13 in}
Segment groove depth of starter commutator	Standard: 0.5 mm {0.02 in} Minimum: 0.2 mm {0.008 in}
Starter brush length	Standard: 12.3 mm {0.48 in} Minimum: 5.5 mm {0.22 in}
Starter brush spring force	Standard: 15.0—20.4 N {1.53—2.08 kgf, 3.38—4.58 lbf} Minimum: 2.75 N {0.28 kgf, 0.62 lbf}

Engine oil specification

Item	U.S.A. and CANADA	Except U.S.A. and CANADA
Engine oil grade		

	 <p>(ILSAC)</p>	  <p>(ILSAC)</p>
		API SM or ILSAC
Engine oil viscosity	5W-20	5W-20 (If SAE 5W-20 engine oil is not available in your market, use SAE 5W-30 engine oil.)


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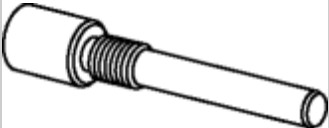
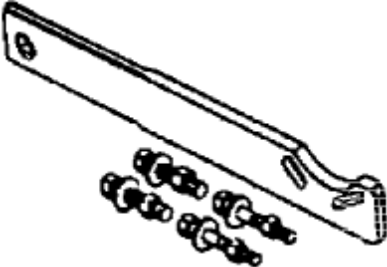
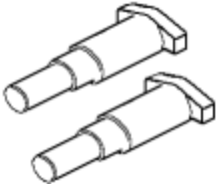
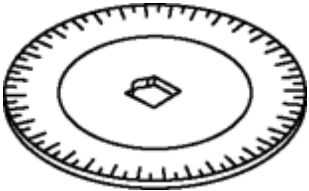

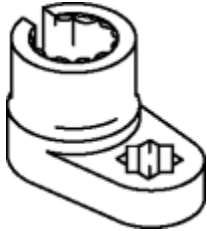
2008 - MX-5 - Engine

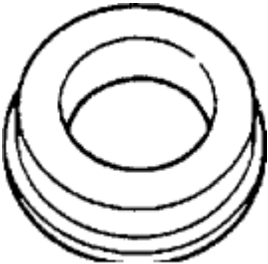




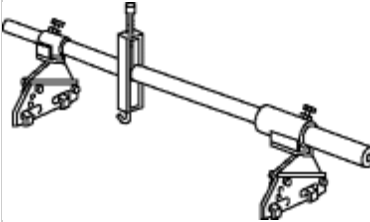
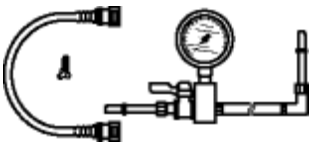
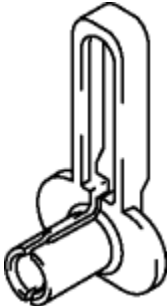
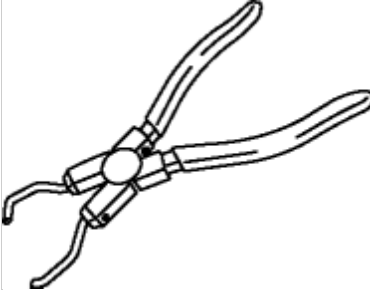
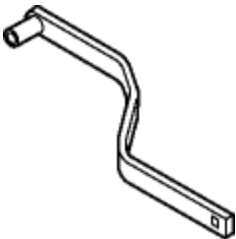
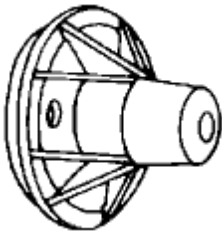

ENGINE SST [LF]

- 1: Mazda **SST** number
- 2: Global **SST** number

Example

1:49 UN30 3465	
2:303-465	
Camshaft Alignment Timing Tool	

1:— 2:303-507 Crankshaft TDC setting peg		1:— 2:205-126 Holding tool		1:49 UN20 507202 2:205-072-02 Crankshaft holding tool pins	
1:49 D032 316 2:— Protractor		1:49 UN30 3465 2:303-465 Camshaft alignment timing tool		1:49 L018 001 2:— O2 sensor wrench	
1:49 G028 205		1:49 0187		1:49 E019 001	

2:— Oil seal installer		280A 2:— Oil pressure gauge		2:— Adapter	
1:— 2: 134–01049 Evaporative emission system tester		1: 49 9200 145 2:— Radiator cap tester adapter set		1: 49 E017 5A0 2:— Engine support	
1: 49 N013 1A0D 2:— Fuel pressure gauge set		1: 49 N013 103A 2:— Remover (Part of 49 N013 1A0D)		1: 49 E042 001 2:— Remover	
1: 49 N013 001 2:— Wrench		1: 49 UN30 3328 2: 303–328 Rear oil seal replacer		1: 49 G040 002 2:— Installer	

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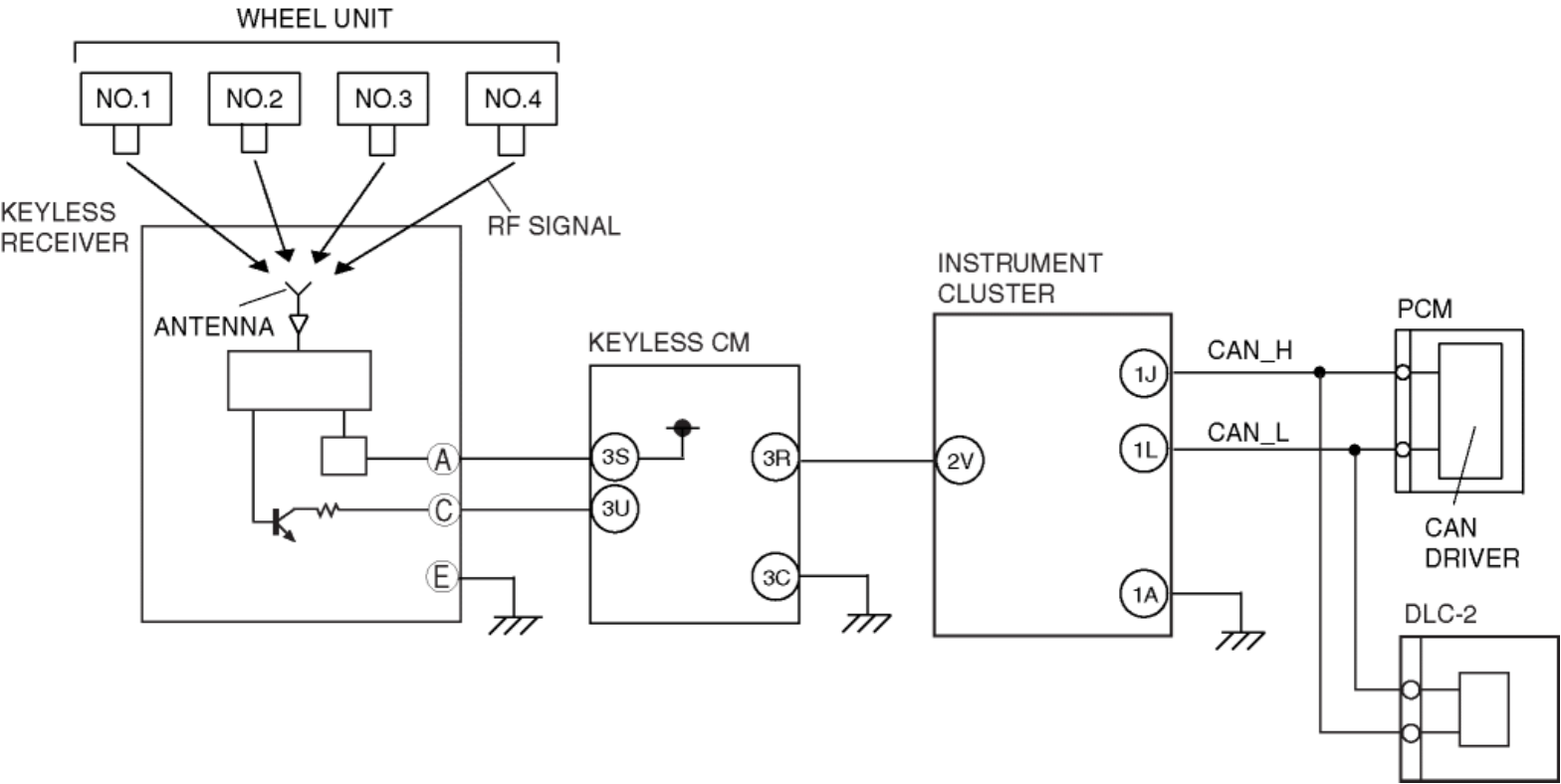
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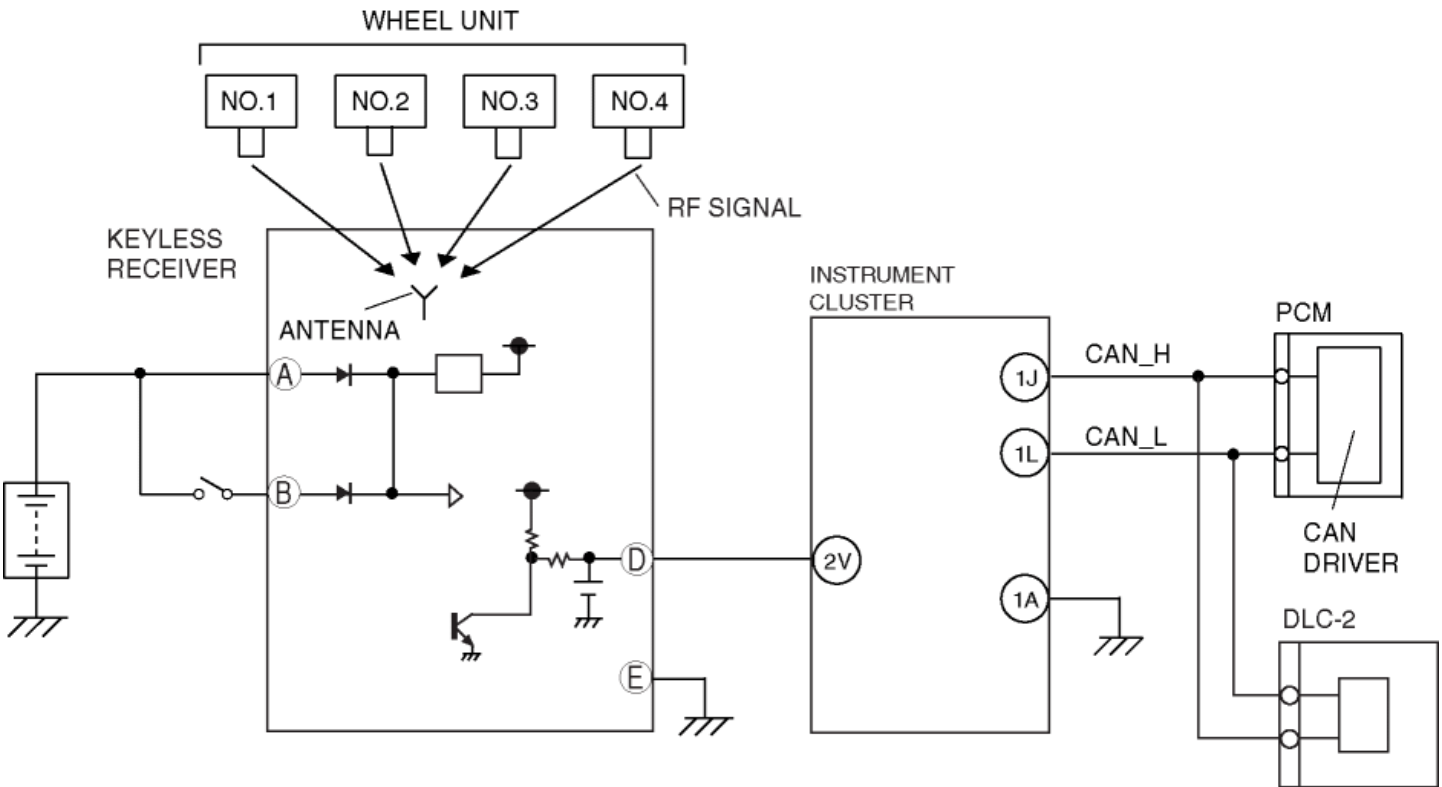
2008 - MX-5 - Suspension

TIRE PRESSURE MONITORING SYSTEM (TPMS) WIRING DIAGRAM

With advanced keyless system or keyless entry system



Without advanced keyless system and keyless entry system





## 2008 - MX-5 - Suspension

### TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS

#### On-Board Diagnostic (OBD) Test Description

- The OBD test inspects the integrity and function of the TPMS and outputs the results when requested by the specific tests.
- On-board diagnostic test also:
  - Provides a quick inspection of the TPMS usually performed at the start of each diagnostic procedure.
  - Provides verification after repairs to ensure that no other faults occurred during service.
- The OBD test is divided into 3 tests:
  - Read/clear diagnostic results, PID monitor and active command mode.

#### Read/clear diagnostic results

- This function allows you to read or clear DTCs in the TPMS control module memory.

#### PID/Data monitor and record

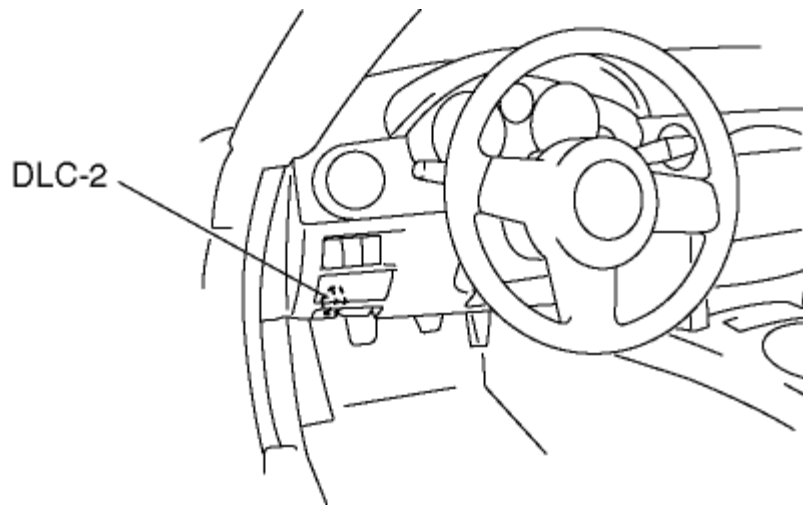
- This function allows you to access certain data values, input signals, calculated values, and system status information.

#### Active command modes

- This function allows you to control devices through the M-MDS.

#### Reading DTCs Procedure

1. Connect the M-MDS to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  1. Select "Self Test".
  2. Select "Modules".
  3. Select "IC".
- When using the PDS (Pocket PC)
  1. Select "Module Tests".
  2. Select "IC".
  3. Select "Self Test".

3. Verify the DTC according to the directions on the screen.

- If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.

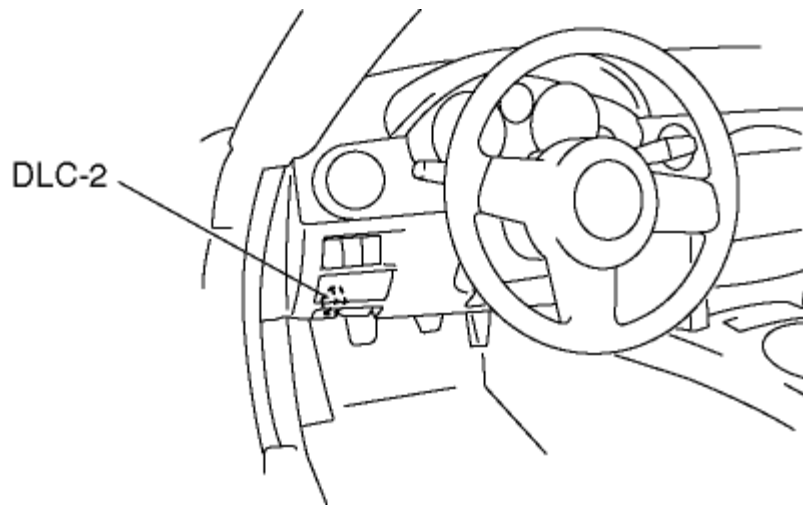
4. After completion of repairs, clear all DTCs stored in the TPMS. (See [Clearing DTCs Procedure](#).)

## Clearing DTCs Procedure

### NOTE:

- If the DTC clearing procedure is implemented, the TPMS warning light and flat tire warning light turn off.

1. Connect the M-MDS to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  1. Select "Self Test".
  2. Select "Modules".
  3. Select "IC".
- When using the PDS (Pocket PC)
  1. Select "Module Tests".
  2. Select "IC".
  3. Select "Self Test".

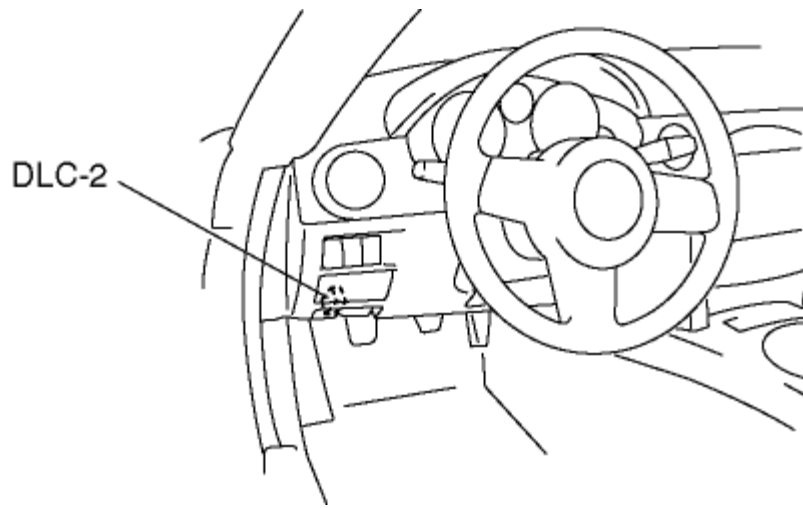
3. Verify the DTC according to the directions on the screen.

4. Press the clear button on the DTC screen to clear the DTC.

5. Verify that no DTCs are displayed.

## **PID/Data Monitor and Record Procedure**

1. Connect the M-MDS to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  1. Select "DataLogger".
  2. Select "Modules".
  3. Select "IC".
- When using the PDS (Pocket PC)
  1. Select "Module Tests".
  2. Select "IC".
  3. Select "DataLogger".

3. Select the applicable PID from the PID table.

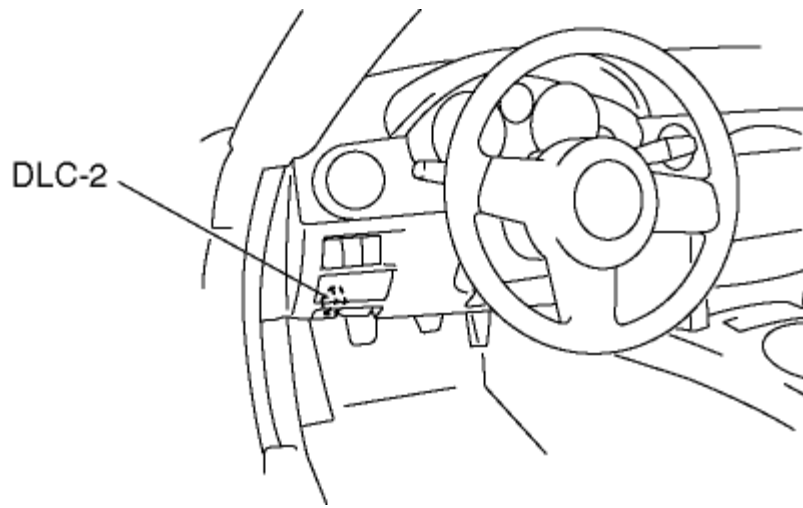
4. Verify the PID data according to the directions on the screen.

#### **NOTE:**

- The PID data screen function is used for monitoring the calculated value of input/output signals in the module. Therefore, if the monitored value of the output parts is not within the specification, it is necessary to inspect the monitored value of input parts corresponding to the applicable output part control. In addition, because the system does not display an output part malfunction as an abnormality in the monitored value, it is necessary to inspect the output parts individually.

#### **Active Command Modes Procedure**

1. Connect the M-MDS to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  1. Select "DataLogger".
  2. Select "Modules".
  3. Select "IC".
- When using the PDS (Pocket PC)
  1. Select "Module Tests".
  2. Select "IC".
  3. Select "DataLogger".

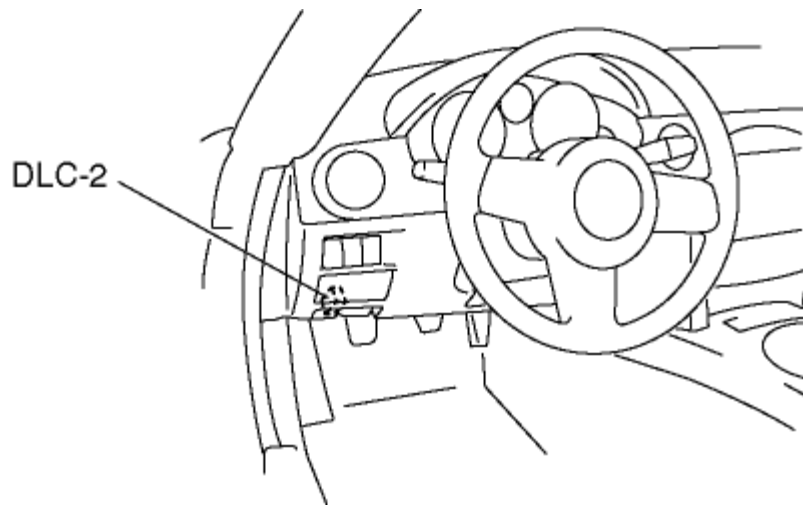
3. Select the active command modes from the PID table.

4. Perform the active command modes, inspect the operations for each parts.

- If the operation of output parts cannot be verified after the active command mode inspection is performed, this could indicate the possibility of an open or short circuit, sticking, or operation malfunction in the output parts.

### **Freeze Frame PID Data Access Procedure**

1. Connect the M-MDS to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- This function is available for only the IDS (laptop PC)
  1. Select "Body".
  2. Select "TPMS Functions".
  3. Select "Freeze Frame Data".

## DTC Table

DTC	Description	Page
M-MDS		
B1342	Instrument cluster internal malfunction	(See <a href="#">DTC B1342 [INSTRUMENT CLUSTER].</a> )
B2143	ID registration failure	(See <a href="#">DTC B2143.</a> )
B2477	Instrument cluster configuration not performed	(See <a href="#">DTC B2477 [INSTRUMENT CLUSTER].</a> )
B2868	Wheel unit No.1 internal malfunction	(See <a href="#">DTC B2868, B2869, B2870, B2871.</a> )
B2869	Wheel unit No.2 internal malfunction	(See <a href="#">DTC B2868, B2869, B2870, B2871.</a> )
B2870	Wheel unit No.3 internal malfunction	(See <a href="#">DTC B2868, B2869, B2870, B2871</a> )



		.)
B2871	Wheel unit No.4 internal malfunction	(See <b>DTC B2868, B2869, B2870, B2871.</b> )
U0127	Communication failure between instrument cluster and keyless receiver	(See <b>DTC U0127.</b> )
U2616	Wheel unit No.1 (No response)	(See <b>DTC U2616, U2617, U2618, U2619.</b> )
U2617	Wheel unit No.2 (No response)	(See <b>DTC U2616, U2617, U2618, U2619.</b> )
U2618	Wheel unit No.3 (No response)	(See <b>DTC U2616, U2617, U2618, U2619.</b> )
U2619	Wheel unit No.4 (No response)	(See <b>DTC U2616, U2617, U2618, U2619.</b> )

## PID/DATA Monitor Table

PID Name (Definition)	Unit/ Condition	Condition/Specification	Action
AI_WU1_ID AI_WU2_ID AI_WU3_ID AI_WU4_ID (Wheel unit ID code (during ID registration))	–	Indicates the wheel unit ID code. (During wheel unit ID registration.)	<ul style="list-style-type: none"> <li>Replace the wheel unit.</li> <li>Perform the wheel unit ID registration.</li> </ul>
AI_WU1_P AI_WU2_P AI_WU3_P AI_WU4_P (Tire pressure value (during ID registration))	Pa, psi	Indicates the tire pressure. (During ID registration.)	<ul style="list-style-type: none"> <li>Adjust tire pressure.</li> <li>Replace the wheel unit.</li> <li>Perform the wheel unit ID registration.</li> </ul>

FFD1_WU1_P FFD1_WU2_P FFD1_WU3_P FFD1_WU4_P (Tire pressure value (freeze frame PID data 1))	Pa, psi	Indicates the tire pressure. (Freeze frame PID data 1)	Adjust tire pressure.
FFD2_WU1_P FFD2_WU2_P FFD2_WU3_P FFD2_WU4_P (Tire pressure value (freeze frame PID data 2))	Pa, psi	Indicates the tire pressure. (Freeze frame PID data 2)	Adjust tire pressure.
FFD1_WU1_T FFD1_WU2_T FFD1_WU3_T FFD1_WU4_T (Internal tire air temperature value (freeze frame PID data 1))	°C, °F	Indicates the internal tire air temperature. (Freeze frame PID data 1)	Adjust tire pressure.
FFD2_WU1_T FFD2_WU2_T FFD2_WU3_T FFD2_WU4_T (Internal tire air temperature value (freeze frame PID data 2))	°C, °F	Indicates the internal tire air temperature. (Freeze frame PID data 2)	Adjust tire pressure.
FFD1_MLG (Wheel unit mileage value (freeze frame PID data 1))	m, mi (ft)	Indicates the mileage. (Freeze frame PID data 1)	Adjust tire pressure.
FFD2_MLG (Wheel unit mileage value (freeze frame PID data 2))	m, mi (ft)	Indicates the mileage. (Freeze frame PID data 2)	Adjust tire pressure.
FFD1_SPD	KPH,	Indicates the speed. (Freeze frame	

(Wheel unit speed value (freeze frame PID data 1))	MPH	PID data 1)	Adjust tire pressure.
FFD2_SPD (Wheel unit speed value (freeze frame PID data 2))	KPH, MPH	Indicates the speed. (Freeze frame PID data 2)	Adjust tire pressure.
IC_DTC_CNT (Number of continuous DTCs)	—	<ul style="list-style-type: none"> <li>DTCs detected: <b>1 —255</b></li> <li>No DTCs detected: <b>0</b></li> </ul>	Perform the DTC inspection.
ID_LAST* (Last received tire transmitter ID code value)	—	Indicates the last ID that is transmitted from the wheel unit.	<ul style="list-style-type: none"> <li>Replace the wheel unit.</li> <li>Perform the configuration.</li> </ul>
ID_WU1* ID_WU2* ID_WU3* ID_WU4* (Registered wheel unit ID code)	—	Indicates the registered ID that is transmitted from the wheel unit.	<ul style="list-style-type: none"> <li>Replace the wheel unit.</li> <li>Perform the wheel unit ID registration.</li> </ul>
WU1_P* WU2_P* WU3_P* WU4_P* (Tire pressure value)	Pa, psi	Indicates the tire pressure. (See <b>SUSPENSION TECHNICAL DATA.</b> )	<ul style="list-style-type: none"> <li>Adjust tire pressure.</li> <li>Replace the wheel unit.</li> </ul>
WU1_T* WU2_T* WU3_T* WU4_T* (Internal tire air temperature value)	°C, °F	Indicates the internal tire air temperature.	Replace the wheel unit.

\*

**Data transmission from the wheel unit occurs when the vehicle speed is 25 km/h { 15.5 mph} or more. Due to this, the current air pressure and temperature data can only be displayed after the vehicle is driven at 25 km/h { 15.5 mph} or more. Also, the ID\_LAST,**

and tire pressure and internal tire air temperature data are erased when the instrument cluster connector and the battery terminal are disconnected. If the instrument cluster is replaced or the battery terminals are disconnected, drive the vehicle at 25 km/h {15.5 mph} or more and display the tire pressure PID after the data transmission.

Active Command Modes Table

Command Name	Definition	Operation	Note
IDR_MODE	Wheel unit ID registration mode	ON/OFF	Ignition switch at ON

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## 2008 - MX-5 - Suspension

### MALFUNCTIONING WHEEL UNIT IDENTIFICATION

#### NOTE:

- The tire pressure monitoring system (TPMS) does not identify the location of the malfunctioning wheel unit on the vehicle (LF, RF, LR, RR). The TPMS identifies each wheel unit as No.1, No.2, No.3 and No.4. In order to identify the location of the wheel unit, perform the following procedure.

1. Adjust the air pressure as follows:

- RF: 220 kPa {2.2 kgf/cm<sup>2</sup>, 32 psi}
- LF: 240 kPa {2.4 kgf/cm<sup>2</sup>, 35 psi}
- LR: 260 kPa {2.6 kgf/cm<sup>2</sup>, 38 psi}
- RR: 280 kPa {2.8 kgf/cm<sup>2</sup>, 40 psi}

2. Turn the ignition switch off.

3. Connect the M-MDS to the DLC-2.

4. Turn the ignition switch to the ON position.

5. Drive the vehicle at a speed of **25 km/h {15.5 mph} or more** for **2 min or more**.





6. Select the following PIDs using the M-MDS, and monitor them.

- WU1\_P
- WU2\_P
- WU3\_P
- WU4\_P

7. Determine which wheel unit identification code matches which wheel and tire by comparing the PID monitor values with the air pressure values set in Step 1.

AIR PRESSURE  
VALUE SET IN STEP.1

PID MONITOR VALUE

RF 220 KPA		WU1_P 240 KPA
LF 240 KPA		WU2_P 220 KPA
LR 260 KPA		WU3_P 280 KPA
RR 280 KPA		WU4_P 260 KPA



FR: WU2\_P  
FL: WU1\_P  
RL: WU4\_P  
RR: WU3\_P

8. Select the ID\_LAST PID using the M-MDS, and take a note of four displayed identification codes.

9. Inspect the DTCs using the M-MDS.

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## 2008 - MX-5 - Suspension

### DTC B2143

DTC B2143	<ul style="list-style-type: none"> <li>ID registration failure</li> </ul>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>Two or more codes are overlapping.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>ID registration procedure has not been performed properly.</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY THE PROGRAMMED ID</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Connect the M-MDS to the DLC-2.</li> <li>Select the following PIDs using the M-MDS: <ul style="list-style-type: none"> <li>ID_WU1</li> <li>ID_WU2</li> <li>ID_WU3</li> <li>ID_WU4</li> </ul> </li> <li>Turn the ignition switch to the ON position.</li> <li>Is the same code in the output ID?</li> </ul>	Yes Register the wheel unit ID, then go to the next step.  (See <a href="#">WHEEL UNIT ID REGISTRATION.</a> )
		No Go to the next step.
2	<b>VERIFY TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"> <li>Clear the DTC from the memory.</li> </ul> <p>(See <a href="#">TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS.</a>)</p> <ul style="list-style-type: none"> <li>Drive the vehicle at a speed of</li> </ul>	Yes <ul style="list-style-type: none"> <li>Repeat the inspection from Step 1.</li> </ul> <p>If the malfunction recurs, replace the instrument cluster and/or wheel unit.</p> <p>(See <a href="#">INSTRUMENT CLUSTER REMOVAL/INSTALLATION.</a>)</p>

	<b>25 km/h { 15.5 mph } or more for 10 min or more.</b> <ul style="list-style-type: none"><li>Is the same DTC present?</li></ul>		(See <b>WHEEL UNIT REMOVAL/INSTALLATION.</b> )
		No	Go to the next step.
3	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>Are there any other DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection. (See <b>TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS.</b> )
		No	DTC troubleshooting completed.



## 2008 - MX-5 - Suspension

### DTC B2868, B2869, B2870, B2871

DTC	B2868	Wheel unit No.1 (internal malfunction)
	B2869	Wheel unit No.2 (internal malfunction)
	B2870	Wheel unit No.3 (internal malfunction)
	B2871	Wheel unit No.4 (internal malfunction)
DETECTION CONDITION		<ul style="list-style-type: none"> <li>The instrument cluster receives error signals from the wheel unit.</li> </ul>
POSSIBLE CAUSE		<ul style="list-style-type: none"> <li>Internal malfunction of wheel unit</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>IDENTIFY MALFUNCTIONING WHEEL UNIT</b> <ul style="list-style-type: none"> <li>(See <a href="#">MALFUNCTIONING WHEEL UNIT IDENTIFICATION</a>.)</li> </ul>	<ul style="list-style-type: none"> <li>Identify the malfunctioning wheel unit.</li> <li>Replace and register the wheel unit. (See <a href="#">WHEEL UNIT ID REGISTRATION</a>.)</li> <li>Go to the next step.</li> </ul>
2	<b>VERIFY TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"> <li>Clear the DTC from the memory.</li> <li>(See <a href="#">TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS</a>.)</li> <li>Drive the vehicle at a speed of <b>25 km/h { 15.5 mph} or more</b> for <b>10 min or more</b>.</li> <li>Is the same DTC present?</li> </ul>	Yes Go to Step 1.
		No Go to the next step.
3	<b>VERIFY AFTER REPAIR PROCEDURE</b>	Yes Go to the applicable DTC inspection. (See <a href="#">TIRE</a>

	Are there any other DTCs present?		<b>PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS.)</b>
			No DTC troubleshooting completed.

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## 2008 - MX-5 - Suspension

### DTC U0127

DTC U0127	<ul style="list-style-type: none"> <li>Communication failure between instrument cluster and keyless receiver</li> </ul>
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>The instrument cannot receive signal from the keyless CM or keyless receiver.</li> </ul>
<b>POSSIBLE CAUSE</b>	<p><b>With advanced keyless system and keyless entry system</b></p> <ul style="list-style-type: none"> <li>Open or short circuit in the wiring harness between the keyless CM terminal 3R and the instrument cluster terminal 2V.</li> <li>Keyless control module malfunction.</li> <li>Instrument cluster malfunction.</li> <li>Poor connection at connectors (female terminal)</li> </ul> <p><b>Without advanced keyless system and keyless entry system</b></p> <ul style="list-style-type: none"> <li>Open or short circuit in the wiring harness between the keyless receiver terminal D and the instrument cluster terminal 2V.</li> <li>Keyless receiver malfunction.</li> <li>Instrument cluster malfunction.</li> <li>Poor connection at connectors (female terminal)</li> </ul>

### With Advanced Keyless System or Keyless Entry System

#### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT WHEEL UNIT SIGNAL FOR OPEN CIRCUIT</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect keyless CM and instrument cluster connectors.</li> <li>Inspect for continuity between</li> </ul>	No Repair or replace the wiring harness for an open circuit between keyless CM terminal 3R and instrument cluster terminal 2V, then go to Step 5.

	<p>keyless CM terminal 3R (harness-side) and instrument cluster terminal 2V (harness-side).</p> <ul style="list-style-type: none"><li>• Is there continuity?</li></ul>		
2	<b>INSPECT WHEEL UNIT SIGNAL FOR SHORT TO POWER</b> <ul style="list-style-type: none"><li>• Turn the ignition switch off.</li><li>• Disconnect keyless CM and instrument cluster connectors.</li><li>• Measure the voltage between keyless CM terminal 3R (harness-side) and ground.</li><li>• Is there B+?</li></ul>	Yes	Repair or replace the wiring harness for a short to power between keyless CM terminal 3R and instrument cluster terminal 2V, then go to Step 5.
		No	Go to the next step.
3	<b>INSPECT WHEEL UNIT SIGNAL FOR SHORT TO GROUND</b> <ul style="list-style-type: none"><li>• Turn the ignition switch off.</li><li>• Disconnect keyless CM and instrument cluster connectors.</li><li>• Inspect for continuity between keyless CM terminal 3R (harness-side) and ground.</li><li>• Is there continuity?</li></ul>	Yes	Repair or replace the wiring harness for a short to ground between keyless CM terminal 3R and instrument cluster terminal 2V, then go to the next step.
		No	With advanced keyless system: go to the next step.  With keyless entry system: go to Step 5.
4	<b>INSPECT FOR KEYLESS CM MALFUNCTION</b> <ul style="list-style-type: none"><li>• Turn the ignition switch off.</li><li>• Using the M-MDS, perform the DTC inspection for the keyless CM.</li><li>• Is any DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [ADVANCED KEYLESS SYSTEM]</a> .)
		No	Go to the next step.
5	<b>VERIFY TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"><li>• Clear the DTC from the memory.  (See <a href="#">TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS</a>.)</li><li>• Turn the ignition switch to the ON position and wait for <b>30 s</b>.</li><li>• Is the same DTC present?</li></ul>	Yes	<ul style="list-style-type: none"><li>• If the malfunction recurs, replace the instrument cluster. (See <a href="#">INSTRUMENT CLUSTER REMOVAL/INSTALLATION</a>.)</li><li>• Configure the instrument cluster. (See <a href="#">INSTRUMENT CLUSTER CONFIGURATION</a>.)</li><li>• Register the wheel unit ID. (See <a href="#">WHEEL UNIT ID REGISTRATION</a>.)</li><li>• Go to the next step.</li></ul>
		No	Go to the next step.

6	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Drive the vehicle at a speed of <b>25 km/h { 15.5 mph} or more</b> for <b>10 min or more</b>.</li> <li>Are there any other DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <b>TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS</b> .)
		No	DTC troubleshooting completed.

## Without Advanced Keyless System and Keyless Entry System

### Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>INSPECT WHEEL UNIT SIGNAL FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect keyless receiver and instrument cluster connectors.</li> <li>Inspect for continuity between keyless receiver terminal D (harness-side) and instrument cluster terminal 2V (harness-side).</li> <li>Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit between keyless receiver terminal D and instrument cluster terminal 2V, then go to Step 4.
2	<b>INSPECT WHEEL UNIT SIGNAL FOR SHORT TO POWER</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect keyless receiver and instrument cluster connectors.</li> <li>Measure the voltage between keyless receiver terminal D (harness-side) and ground.</li> <li>Is there B+?</li> </ul>	Yes	Repair or replace the wiring harness for a short to power between keyless receiver terminal D and instrument cluster terminal 2V, then go to Step 4.
		No	Go to the next step.
3	<b>INSPECT WHEEL UNIT SIGNAL FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Disconnect keyless receiver and instrument cluster connectors.</li> </ul>	Yes	Repair or replace the wiring harness for a short to ground between keyless receiver terminal D and instrument cluster terminal 2V, then go to the next step.
		No	Replace keyless receiver, then go to the next step.

	<ul style="list-style-type: none"><li>• Inspect for continuity between keyless receiver terminal D (harness-side) and ground.</li><li>• Is there continuity?</li></ul>		(See <a href="#">KEYLESS RECEIVER REMOVAL/INSTALLATION[ADVANCED KEYLESS SYSTEM]</a> .)
4	<b>VERIFY TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"><li>• Clear the DTC from the memory.  (See <a href="#">TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS</a>.)</li><li>• Turn the ignition switch to the ON position and wait for <b>30 s</b>.</li><li>• Is the same DTC present?</li></ul>	Yes	<ul style="list-style-type: none"><li>• If the malfunction recurs, replace the instrument cluster. (See <a href="#">INSTRUMENT CLUSTER REMOVAL/INSTALLATION</a>.)</li><li>• Configure the instrument cluster. (See <a href="#">INSTRUMENT CLUSTER CONFIGURATION</a>.)</li><li>• Register the wheel unit ID. (See <a href="#">WHEEL UNIT ID REGISTRATION</a>.)</li><li>• Go to the next step.</li></ul>
		No	Go to the next step.
5	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Drive the vehicle at a speed of <b>25 km/h { 15.5 mph} or more</b> for <b>10 min or more</b>.</li><li>• Are there any other DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS</a> .)
		No	DTC troubleshooting completed.

## 2008 - MX-5 - Suspension

### DTC U2616, U2617, U2618, U2619

DTC	U2616	Wheel unit No.1 (No response)
	U2617	Wheel unit No.2 (No response)
	U2618	Wheel unit No.3 (No response)
	U2619	Wheel unit No.4 (No response)
DETECTION CONDITION		<ul style="list-style-type: none"> <li>The keyless receiver has continuously not received a signal from the wheel unit for a certain period.</li> </ul>
POSSIBLE CAUSE		<ul style="list-style-type: none"> <li>Wheel unit identification code is not registered in the instrument cluster.</li> <li>No signal is received from the wheel unit.</li> <li>Wheel unit is not installed.</li> <li>Poor connection at connectors (female terminal).</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>VERIFY WHEEL UNIT IS INSTALLED TO EACH WHEEL</b> <ul style="list-style-type: none"> <li>Are all four wheels equipped with a wheel unit?</li> </ul>	Yes	Go to the Step 3.
		No	<ul style="list-style-type: none"> <li>Install the wheel unit. (See <b>WHEEL UNIT REMOVAL/INSTALLATION.</b>)</li> <li>Register the wheel unit ID. (See <b>WHEEL UNIT ID REGISTRATION.</b>)</li> <li>Go to the next step.</li> </ul>
2	<b>INSPECT FOR DTCs</b> <ul style="list-style-type: none"> <li>Drive the vehicle at a speed of <b>25 km/h {15.5 mph} or more</b> for <b>10 min or more</b>.</li> <li>Is the same DTC present?</li> </ul>	Yes	Go to the next step.
		No	With advanced keyless system : go to the Step 4.  With keyless entry system, and without advanced keyless system and keyless entry system: go to the Step 5.

3	<b>IDENTIFY MALFUNCTIONING WHEEL UNIT</b> <ul style="list-style-type: none"> <li>(See <b>MALFUNCTIONING WHEEL UNIT IDENTIFICATION.</b>)</li> </ul>		<ul style="list-style-type: none"> <li>Identify the malfunctioning wheel unit.</li> <li>Replace the wheel unit. (See <b>WHEEL UNIT REMOVAL/INSTALLATION.</b>)</li> <li>Register the wheel unit ID. (See <b>WHEEL UNIT ID REGISTRATION.</b>)</li> <li>Go to the Step 5.</li> </ul>
4	<b>INSPECT FOR KEYLESS CM MALFUNCTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch off.</li> <li>Using the M-MDS, perform the DTC inspection for the keyless CM.</li> <li>Is any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [ADVANCED KEYLESS SYSTEM].</b> )
		No	Go to the next step.
5	<b>VERIFY TROUBLESHOOTING COMPLETED</b> <ul style="list-style-type: none"> <li>Clear the DTC from the memory.</li> <li>(See <b>TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS.</b>)</li> <li>Drive the vehicle at a speed of <b>25 km/h { 15.5 mph} or more</b> for <b>10 min or more</b>.</li> <li>Is the same DTC present?</li> </ul>	Yes	<ul style="list-style-type: none"> <li>If the malfunction recurs, replace the instrument cluster. (See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION.</b>)</li> <li>Configure the instrument cluster. (See <b>INSTRUMENT CLUSTER CONFIGURATION.</b>)</li> <li>Register the wheel unit ID. (See <b>WHEEL UNIT ID REGISTRATION.</b>)</li> <li>Go to the next step.</li> </ul>
		No	Go to the next step.
6	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Are there any other DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <b>TIRE PRESSURE MONITORING SYSTEM (TPMS) ON-BOARD DIAGNOSIS.</b> )
		No	DTC troubleshooting completed.

#### NOTE:

- If the installed wheel unit ID number is known, verification of whether the instrument cluster is receiving data from the wheel unit can be easily confirmed using the following procedure:
  - Drive the vehicle at **25 km/h { 15.5 mph} or more**, and send data from the wheel unit.
  - Select [ID\_LAST] from the PID items, and monitor the data.



3. Verification that the instrument cluster is receiving data is possible if the monitored ID number matches the installed wheel unit ID number.
- If the wheel unit has been newly replaced, the TPMS warning light may flashes before the ID registration is complete, and DTC U2616, U2617, U2618 and U2619 may be stored in the memory. In this case, re-implement the wheel unit ID registration, and after confirming that the TPMS warning light is no longer flashing, erase the DTC. If the TPMS warning light does not go out, a malfunction on any one of the wheel units may have occurred and the ID registration will not have been correctly performed. Repeat the diagnostic procedure from Step 1 and perform and inspection.

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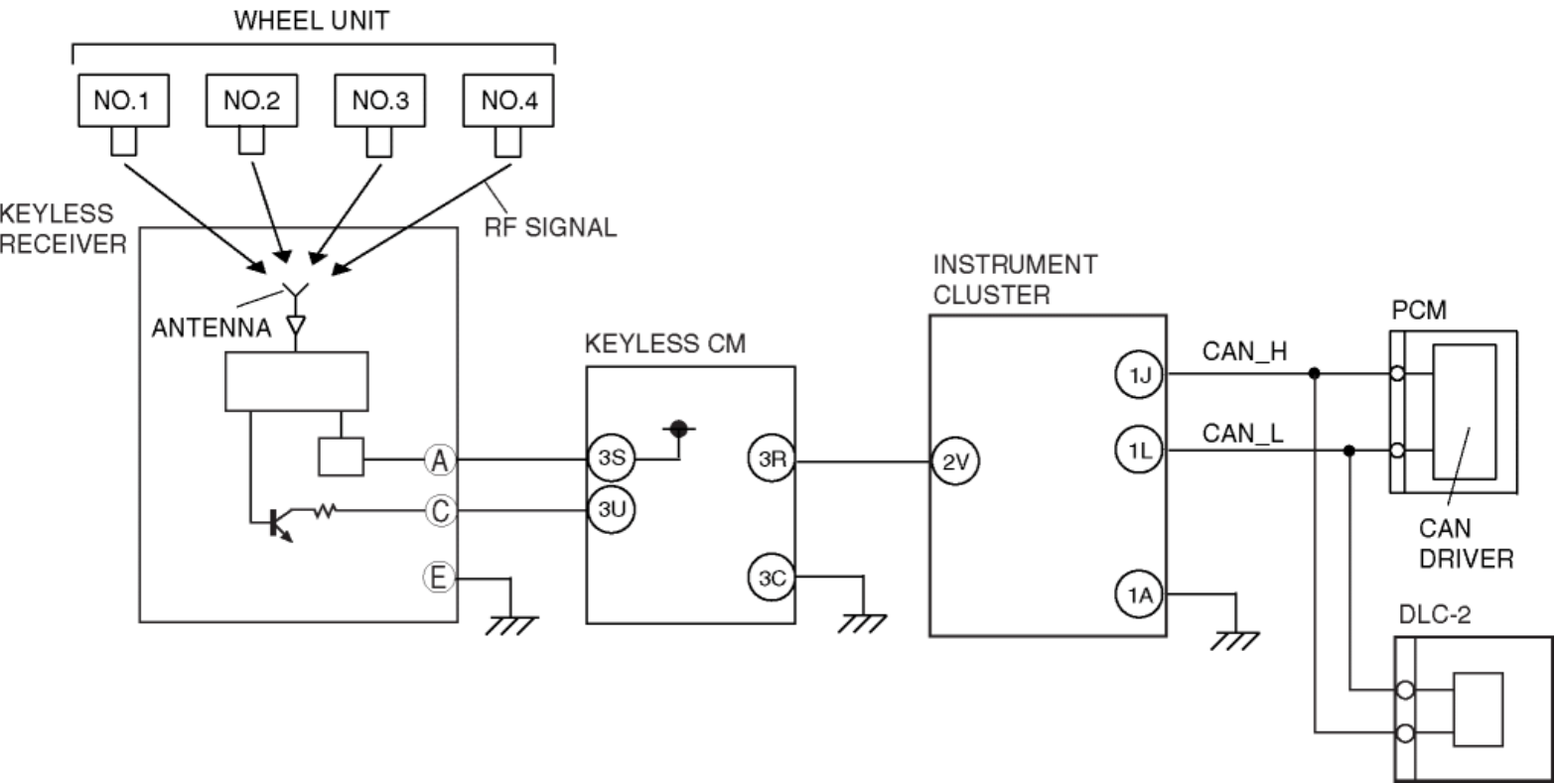
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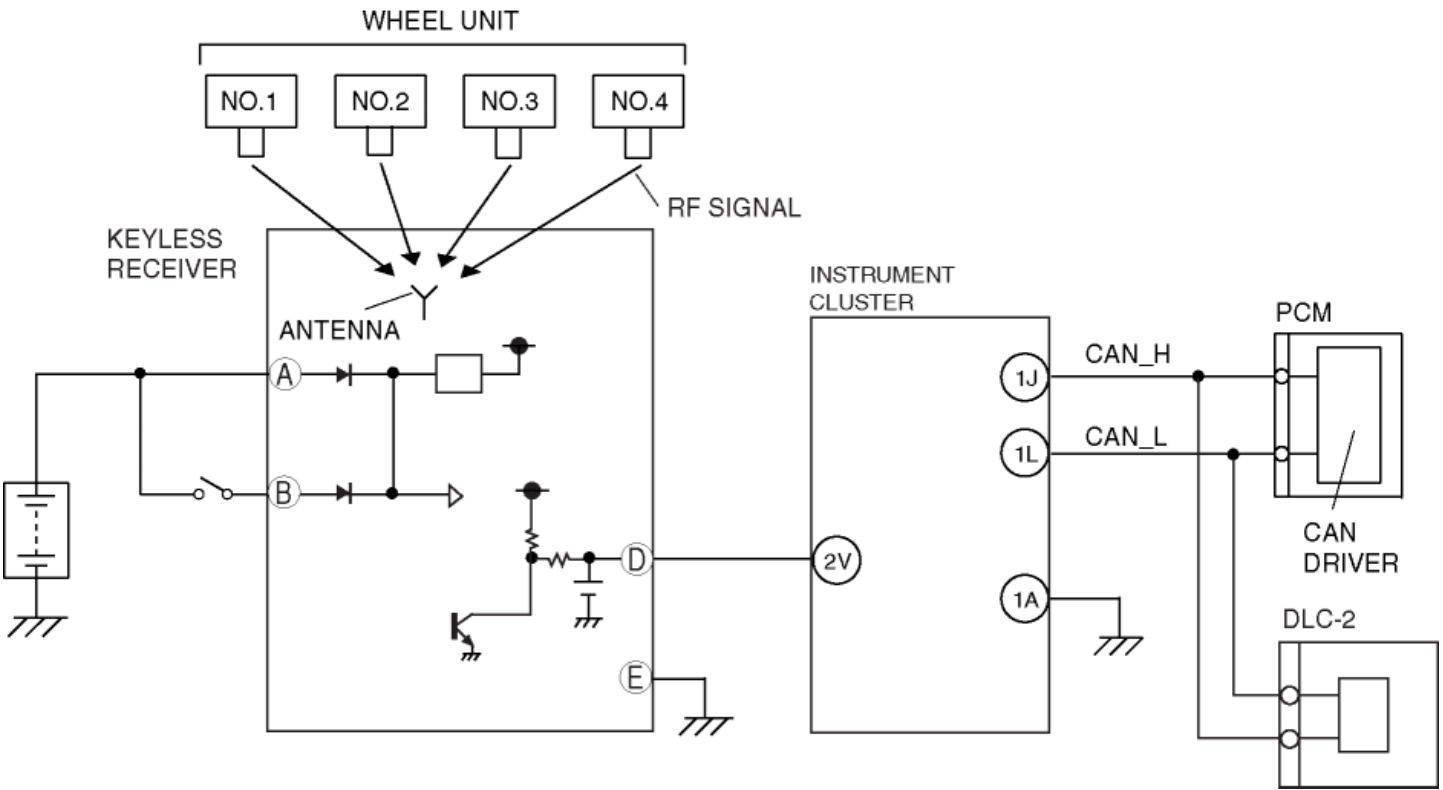
2008 - MX-5 - Suspension

TIRE PRESSURE MONITORING SYSTEM (TPMS) WIRING DIAGRAM

With advanced keyless system or keyless entry system



Without advanced keyless system and keyless entry system





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### FOREWORD

- Before performing the steps in Symptom Troubleshooting, perform the On-board Diagnostic Inspection. To check the DTC, follow the DTC Inspection steps. (See [TIRE PRESSURE MONITORING SYSTEM \(TPMS\) ON-BOARD DIAGNOSIS](#).)

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## 2008 - MX-5 - Suspension

### PRECAUTION

#### Intermittent Concern Troubleshooting

##### Vibration method

- If malfunction occurs or becomes worse while driving on a rough road or when the engine is vibrating, perform the steps below.

##### NOTE:

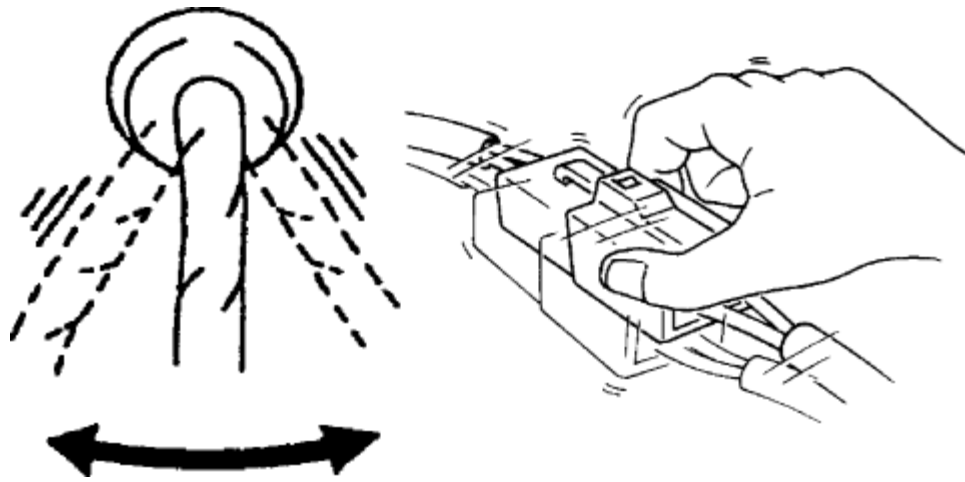
- There are several reasons why vehicle or engine vibration could cause an electrical malfunction. Some of the things to check for are:
  - Connectors not fully seated.
  - Wire harnesses not having full play.
  - Wires laying across brackets or moving parts.
  - Wires routed too close to hot parts.
- An improperly routed, improperly clamped, or loose harness can cause wiring to become pinched between parts.
- The connector joints, points of vibration, and places where wire harnesses pass through the firewall, body panels and other panels are the major areas to be checked.

##### Inspection method for switch and/or sensor connectors or wires

1. Connect M-MDS to DLC-2.
2. Turn the ignition switch to the ON position (engine off).

##### NOTE:

- If engine starts and runs, perform the following steps at idle.
3. Access PIDs for the switch you are inspecting.
  4. Turn switch on manually.
  5. Shake each connector or wire harness a bit vertically and horizontally while monitoring the PID.



- If PID value is unstable, check for poor connection.

#### Inspection method for sensors

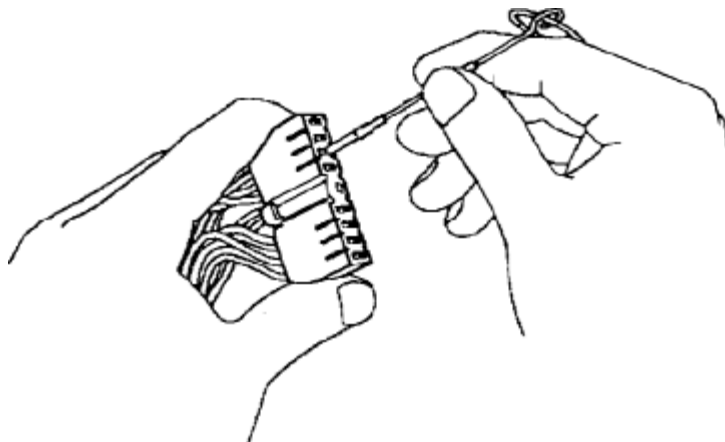
1. Connect M-MDS to DLC-2.
2. Turn the ignition switch to the ON position (engine off).

#### NOTE:

- If engine starts and runs, perform the following steps at idle.
3. Access PIDs for the switch you are inspecting.
  4. Vibrate the sensor slightly with your finger.
- If PID value is unstable or malfunction occurs, check for poor connection and/or poorly mounted sensor.

#### Connector terminal check method

1. Check the connection condition of each female terminal.
2. Insert male terminal; fit the female terminal side to female terminal and check to see whether the malfunction is in the female terminal or not.





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SYMPTOM TROUBLESHOOTING

No.	Symptom
1	TPMS warning light illuminates continuously.
2	TPMS warning light (low pressure warning) illuminates after engine start and turns off after driving for a period of time.
3	Flat tire warning light (flat tire warning) illuminates.
4	Wheel unit ID registration cannot be performed (TPMS warning light flashes).



## 2008 - MX-5 - Suspension

### NO.1 TPMS WARNING LIGHT ILLUMINATES CONTINUOUSLY

#### CAUTION:

- The tire pressure cannot be measured accurately after driving for a long period due to the internal temperature and pressure. Stop the vehicle for approx. 1 hour and then perform the tire pressure measurement and adjustment.
- Use a high accuracy digital gauge for measurement of the tire pressure.

#### NOTE:

- If the DTC clearing procedure is implemented, the TPMS warning light turns off.

1	TPMS warning light illuminates continuously
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"><li>• Tire pressure is lower than the specification. (Such as loss of air pressure due to puncture.)</li><li>• TPMS warning light circuit malfunction in the instrument cluster.</li></ul>

#### Diagnostic Procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT TIRE</b> <ul style="list-style-type: none"><li>• Inspect the tires.</li><li>• Is there any foreign object adhering to the tire?</li></ul>	Yes Remove the any foreign object.  Replace the tire if necessary, then go to the next step.
		No Go to the next step.
2	<b>MEASURE TIRE PRESSURE</b> <ul style="list-style-type: none"><li>• Measure the tire pressure when the tires are cold.</li><li>• Is the tire pressure lower than the specification?</li></ul>	Yes Adjust the tire pressure to the specification when the tires are cold, then go to the next step.  (See <b>TIRE PRESSURE ADJUSTMENT (WITH TPMS)</b> .)
		No Go to the next step.
3	<b>VERIFY TPMS WARNING LIGHT</b> <ul style="list-style-type: none"><li>• Verify the TPMS warning light.</li></ul>	Yes Symptom troubleshooting completed.

	<ul style="list-style-type: none"> <li>Does the TPMS warning light turn off?</li> </ul>	Explain to the customer what has been repaired.
		No Go to the next step.
4	<b>VERIFY TPMS WARNING LIGHT AFTER DRIVING THE VEHICLE</b> <ul style="list-style-type: none"> <li>Drive the vehicle at speed of <b>25 km/h {16 mph} or more for 10 min or more.</b></li> <li>Verify the TPMS warning light.</li> <li>Does the TPMS warning light turn off?</li> </ul>	Yes Symptom troubleshooting completed.  Explain to the customer what has been repaired.
		No Go to the next step.
5	<b>INSPECT FOR DTCS IN INSTRUMENT CLUSTER</b> <ul style="list-style-type: none"> <li>Connect the M-MDS to DLC-2.</li> <li>Retrieve the instrument cluster DTC.</li> <li>Is the DTC displayed?</li> </ul>	Yes Go to applicable DTC troubleshooting procedure.  (See <b>DTC TABLE [INSTRUMENT CLUSTER].</b> )
		No Malfunction is in the TPMS warning light illumination control circuit in the instrument cluster.  Replace the instrument cluster.  (See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION.</b> )

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### NO.2 TPMS WARNING LIGHT (LOW PRESSURE WARNING) ILLUMINATES AFTER ENGINE START AND TURNS OFF AFTER DRIVING FOR PERIOD OF TIME

#### CAUTION:

- The tire pressure cannot be measured accurately after driving for a long period due to increased internal temperature and pressure. Stop the vehicle for approx. 1 hour and then perform the tire pressure measurement and adjustment.
- Use a high accuracy digital gauge for measurement of the tire pressure.

#### NOTE:

- The tire pressure decreases spontaneously by **approx. 7 kPa {0.07 kgf/cm<sup>2</sup>, 1.02 psi}** per month even if the tire is normal.
- The FFD (temperature and pressure) stored when the TPMS warning light is turned on of off can be verified by operating the M-MDS.

2	TPMS warning light (low pressure warning) illuminates after engine start and turns off after driving for a period of time.
---	--

#### [TROUBLESHOOTING HINTS]

- The tire pressure decreases (approaches value to illuminate TPMS warning light) when the internal temperature of the tire is low.

STEP	INSPECTION		ACTION
1	<b>INSPECT THE TIRE</b> <ul style="list-style-type: none"> <li>• Is there any foreign object adhering to the tire?</li> </ul>	Yes	Remove any foreign object. Replace the tire if necessary, and then go to the next step.
		No	Go to the next step.
2	<b>MEASURE THE TIRE PRESSURE WHEN THE TIRES ARE COLD</b> <ul style="list-style-type: none"> <li>• Has the tire pressure decreased (approaches value to illuminate TPMS warning light)?</li> </ul>	Yes	Adjust the tire pressure to the specification while the tires are cold, and then go to the next step.
		No	Go to the next step.

3	IS THE MALFUNCTION CORRECTED?	Yes	Troubleshooting completed.
		No	Verify troubleshooting again and return to Step 1 if the malfunction recurs.

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### NO.3 FLAT TIRE WARNING LIGHT (FLAT TIRE WARNING) ILLUMINATES

#### NOTE:

- When the DTC clear command of the M-MDS is operated, the flat tire warning light can be turned off.
- The FFD (temperature and pressure) stored when the flat tire warning light is turned on or off can be verified by operating the M-MDS.

3	Flat tire warning light (flat tire warning) illuminates.	
<b>[TROUBLESHOOTING HINTS]</b> <ul style="list-style-type: none"><li>• Flat tire</li></ul>		
STEP	INSPECTION	ACTION
1	<b>IDENTIFY THE FLAT TIRE</b> <ul style="list-style-type: none"><li>• Can the flat tire be identified by a visual check or using a digital gauge?</li></ul>	Yes Replace the flat tire, and then go tot the next step.
		No Go to the next step.
2	<b>DOES THE FLAT TIRE WARNING LIGHT TURN OFF?</b> <ul style="list-style-type: none"><li>• Adjust the tire pressure, and then drive the vehicle at <b>25 km/h { 15.5 mph} or more</b> for <b>10 min of more</b>.</li></ul>	Yes Troubleshooting completed.
		No Verify troubleshooting again and return to Step 1 if the malfunction recurs.

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### NO.4 WHEEL UNIT ID REGISTRATION CANNOT BE PERFORMED (TPMS WARNING LIGHT FLASHES)

#### CAUTION:

- Activate the wheel unit ID registration mode using the M-MDS, and perform the following steps if the TPMS warning light does not turn off after driving at 25 km/h {16 mph} or more for 10 min or more.

3	Wheel unit ID registration cannot be performed (TPMS warning light flashes)
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>• New wheel unit malfunction (caused when install to the wheel).</li> <li>• Any malfunction on an old wheel unit which has not been replaced.</li> </ul>

#### Diagnostic Procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY REGISTRATION OF WHEEL UNIT</b> <ul style="list-style-type: none"> <li>• Connect the M-MDS to the DLC-2.</li> <li>• Display the wheel unit ID registration condition (ID and tire pressure table) using the M-MDS. (See <b>WHEEL UNIT ID REGISTRATION.</b>)</li> <li>• Temporarily remove the battery and reinstall it immediately.</li> </ul> <b>NOTE:</b> <ul style="list-style-type: none"> <li>• If the battery is removed, the tire pressure data for WU1_P to WU4_P stored in the instrument cluster is reset.</li> <li>• Tire pressure is <b>0 kPa {0 kgf/cm<sup>2</sup>, 0 psi}</b> when it is displayed again using the M-MDS.</li> <li>• Set the tire pressure for the four wheels</li> </ul>	<div>Yes</div> Symptom troubleshooting completed.  Adjust the tire pressure on four wheels, then return the vehicle to the customer.  (See <b>TIRE PRESSURE ADJUSTMENT (WITH TPMS).</b> )
		<div>No</div> Go to the next step.

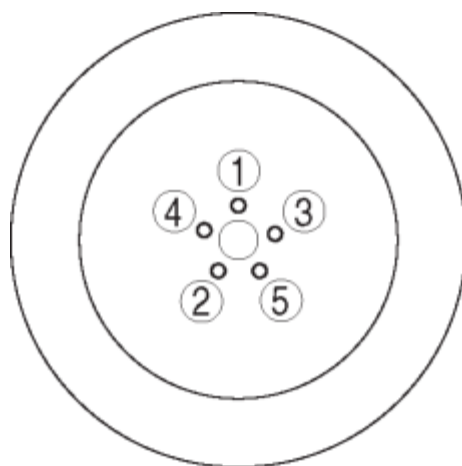
	<p>separately.</p> <ul style="list-style-type: none"> <li>Perform the "WHEEL UNIT ID REGISTRATION" using the M-MDS again.</li> </ul> <p>(See <b>WHEEL UNIT ID REGISTRATION</b>.)</p> <ul style="list-style-type: none"> <li>Can the wheel unit ID be registered?</li> </ul>		
2	<b>IDENTIFY UNREGISTERED WHEEL UNIT</b> <ul style="list-style-type: none"> <li>Identify the malfunctioning wheel unit.</li> </ul> <p>(See <b>MALFUNCTIONING WHEEL UNIT IDENTIFICATION</b>.)</p> <ul style="list-style-type: none"> <li>Is the wheel unit for which the ID could not be registered a new wheel unit?</li> </ul>	Yes	Replace with a new wheel unit, then go to Step 4.
		No	Go to the next step.
3	<p>Replace the old wheel unit, then go to the next step (any malfunction on an old wheel unit which has not been replaced).</p> <p>(See <b>WHEEL UNIT REMOVAL/INSTALLATION</b>.)</p>		
4	<b>VERIFY REGISTRATION OF WHEEL UNIT</b> <ul style="list-style-type: none"> <li>Perform the "WHEEL UNIT ID REGISTRATION" using the M-MDS.</li> </ul> <p>(See <b>WHEEL UNIT ID REGISTRATION</b>.)</p> <ul style="list-style-type: none"> <li>Can the wheel unit ID be registered?</li> </ul>	Yes	Symptom troubleshooting completed.
		No	Verify the symptom troubleshooting again and return to Step 1 if the malfunction recurs.

## 2008 - MX-5 - Suspension

### GENERAL PROCEDURES (SUSPENSION)

#### Wheel And Tire Installation

1. When installing the wheels and tires, tighten the wheel nuts in a criss-cross pattern to the following tightening torque.



#### Tightening torque

- 88—118 N·m { 9.0—12.0 kgf·m, 65.0—87.0 ft·lbf }

#### Suspension Links Removal/Installation

1. For the joint sections with rubber bushings, raise the vehicle using a lift, and then temporarily tighten the installation bolts and nuts. Lower the vehicle to the ground and tighten them completely with the specified torque.

#### Connector Disconnection

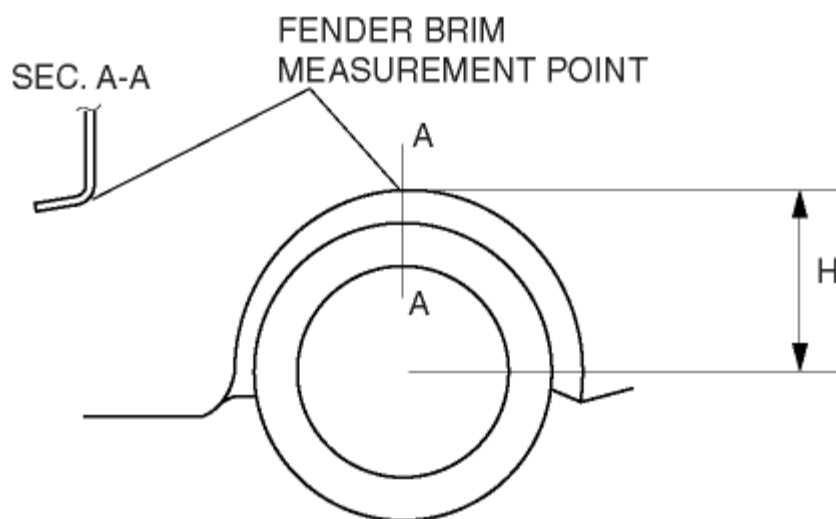
1. Disconnect the negative battery cable before performing any work that requires handling of connectors. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)



## 2008 - MX-5 - Suspension

### WHEEL ALIGNMENT PRE-INSPECTION

1. Park the vehicle on level ground, in an unloaded condition\*, and with the wheels straight forward.
2. Inspect the tire pressure.
  - Adjust to the recommended pressure if necessary. (See **SUSPENSION TECHNICAL DATA**.)
3. Inspect the wheel bearing play.
  - Correct if necessary. (See **WHEEL HUB, STEERING KNUCKLE INSPECTION**.) (See **WHEEL HUB COMPONENT INSPECTION**.)
4. Inspect the wheel runout.
  - Correct if necessary. (See **SUSPENSION TECHNICAL DATA**.)
5. Rock the vehicle, and verify that there is no looseness in the steering wheel joint and suspension ball joint.
6. Rock the vehicle, and verify that the shock absorber operates properly.
7. Measure height H from the center of the wheel to the fender brim.



8. Verify that the difference between the left and right dimension H is within the specification.
  - If it exceeds the specification, repeat the Step 2—7.
  - Standard  
10 mm {0.39 in} or less

\*: Unloaded vehicle.....Fuel tank is full. Engine coolant and engine oil are at specified level. Jack and tools are in designated position.



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FRONT WHEEL ALIGNMENT

Front wheel alignment [16-inch wheel]

Item			Specification
Total toe-in	Tire [Tolerance $\pm 4$ mm {0.15 in}]	(mm {in})	2 {0.08}
	Rim inner	(mm {in})	1.2 $\pm$ 2.4 {0.05 $\pm$ 0.09}
		degree	0°11'±22'
Steering angle [Tolerance $\pm 3^\circ$ ]		Inner	38°42'
		Outer	32°54'
Steering axis inclination (Reference value)			10°39'
Camber [Tolerance $\pm 1^\circ$ ]	Vehicle height: From the end of the front fender to the center of the wheel (mm {in})	356—365 {14.1—14.3}	-0°41'
		366—375 {14.5—14.7}	-0°22'
		376—385 {14.8—15.1}	-0°06'
		386—395 {15.2—15.5}	0°09'
		396—405 {15.6—15.9}	0°21'
Caster		354—363 {14.0—14.2}	6°27'
		364—373 {14.4—14.6}	6°13'

[Tolerance ±1°]	Vehicle height: From the end of the rear fender to the center of the wheel (mm {in})	374—383 { 14.8—15.0 }	5°59′
		384—393 { 15.2—15.4 }	5°45′
		394—403 { 15.6—15.8 }	5°31′

Front wheel alignment [17-inch wheel]

Item			Specification
Total toe-in	Tire [Tolerance ±4 mm {0.15 in}]	(mm {in})	2 {0.08}
	Rim inner	(mm {in})	1.4±2.8 {0.06±0.11}
		degree	0°11′±22′
Steering angle [Tolerance ±3°]		Inner	38°42′
		Outer	32°54′
Steering axis inclination (Reference value)			10°47′
Camber [Tolerance ±1°]	Vehicle height: From the end of the front fender to the center of the wheel (mm {in})	351—360 { 13.8—14.1 }	-0°51′
		361—370 { 14.3—14.5 }	-0°31′
		371—380 { 14.7—14.9 }	-0°14′
		381—390 { 15.0—15.3 }	0°02′
		391—400 { 15.4—15.7 }	0°15′
		349—358 { 13.8—14.0 }	6°34′
		359—368 { 14.2—14.4 }	6°20′

Caster [Tolerance $\pm 1^\circ$ ]	Vehicle height: From the end of the rear fender to the center of the wheel (mm {in})	369—378 { 14.6 —14.8 }	6°06'
		379—388 { 15.0 —15.2 }	5°53'
		389—398 { 15.4 —15.6 }	5°39'

#### NOTE:

- Unloaded vehicle: Fuel tank is full. Engine coolant and engine oil are at specified level. Jack and tools are in designated position.
- Difference between the left and right dimension for camber and caster is within **1°**.

### Steering Angle Adjustment

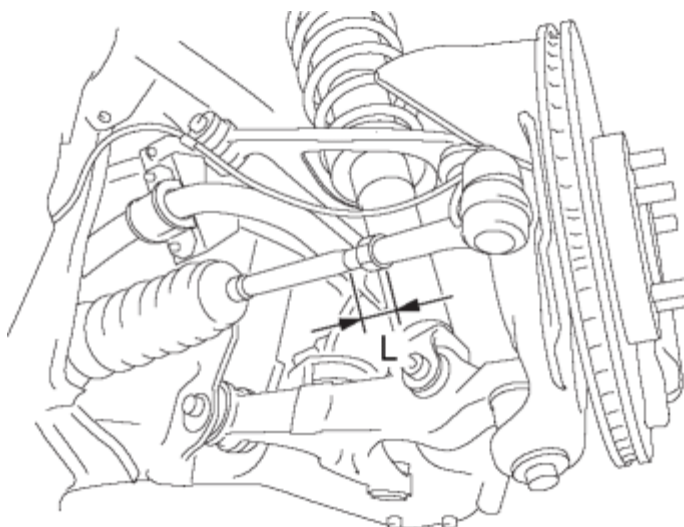
1. Loosen the locknut of the tie-rod end.
2. Remove the rack boot clamp.
3. Rotate the tie rod and adjust the steering angle.

#### Standard steering angle

- Inner: 38°42'±3°
- Outer: 32°54'±3°

#### NOTE:

- Rotate and adjust the tie rod. The difference between the right and left dimension L shown in the figure should be within the specification.



- Standard  
3 mm {0.12 in} or less

4. Tighten the locknut of the tie-rod end.

#### **Tightening torque**

- **68.6—98.0 N·m { 7.00—9.99 kgf·m, 50.6—72.2 ft·lbf }**

5. Correct the rack boot deformation.

6. Install and fix the rack boot clamp.

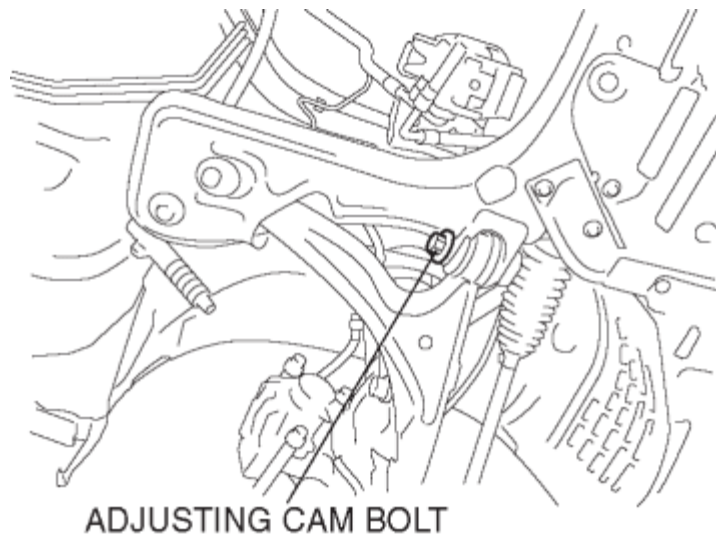
7. After adjusting the steering angle, always inspect and adjust the total toe-in. (See **Total Toe-in Adjustment**.)

### **Camber Adjustment**

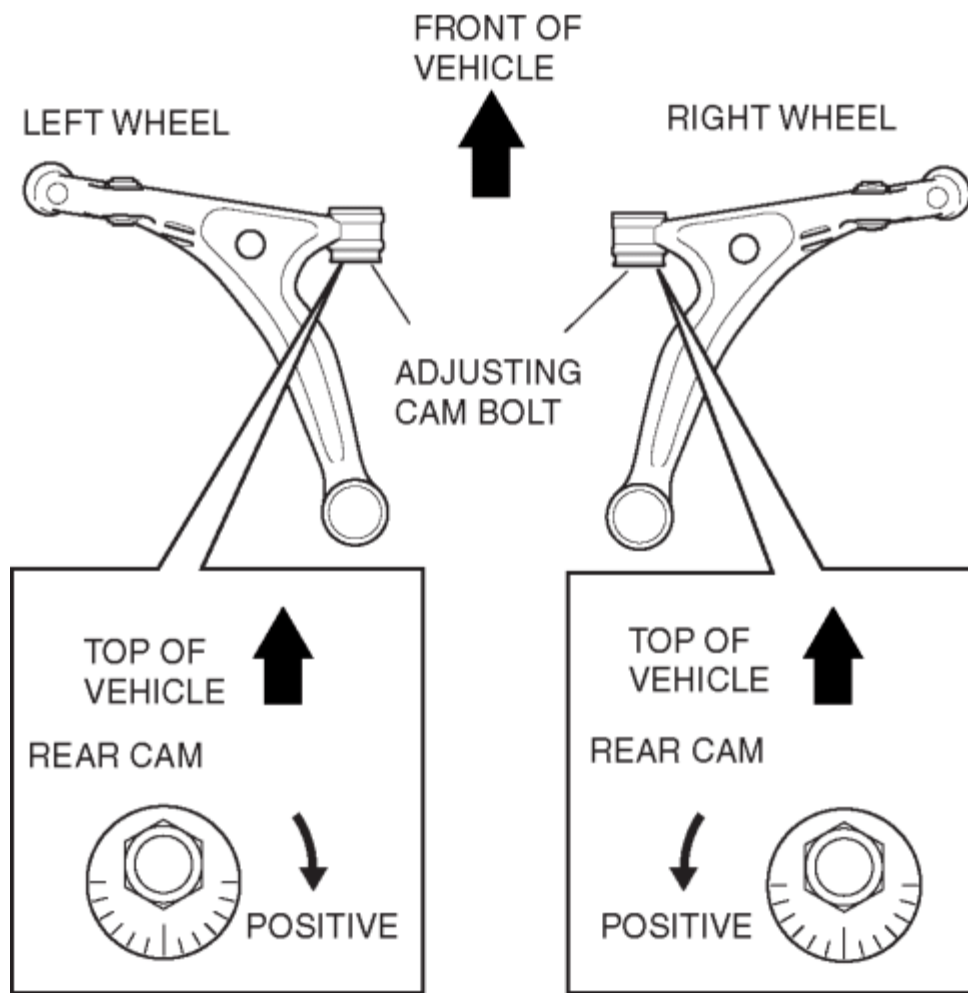
#### **CAUTION:**

- Adjust the camber before adjusting the caster.

1. Loosen the fixing nut of the adjusting cam bolt (front lower arm front side).



2. Rotate the adjusting cam bolt in either direction to adjust the camber.



#### Vehicle equipped with 16-inch wheel

Vehicle height *	Camber
356—365 { 14.1—14.3 }	-0°41'
366—375 { 14.5—14.7 }	-0°22'
376—385 { 14.8—15.1 }	-0°06'
386—395 { 15.2—15.5 }	0°09'
396—405 { 15.6—15.9 }	0°21'

#### Vehicle equipped with 17-inch wheel

Vehicle height *	Camber
351—360 { 13.8—14.1 }	-0°51'

361—370 { 14.3—14.5}	-0°31'
371—380 { 14.7—14.9}	-0°14'
381—390 { 15.0—15.3}	0°02'
391—400 { 15.4—15.7}	0°15'

\*

**From the end of the front fender to the center of the wheel (mm {in})**

	Left wheel	Right wheel
Positive direction	Clockwise	Counterclockwise
Negative direction	Counterclockwise	Clockwise

3. Tighten the nut.

#### **Tightening torque**

- **117.7—137.3 N·m { 12.1—14.0 kgf·m, 86.9—101.2 ft·lbf }**

4. Adjust the total toe-in. (See [Total Toe-in Adjustment](#).)

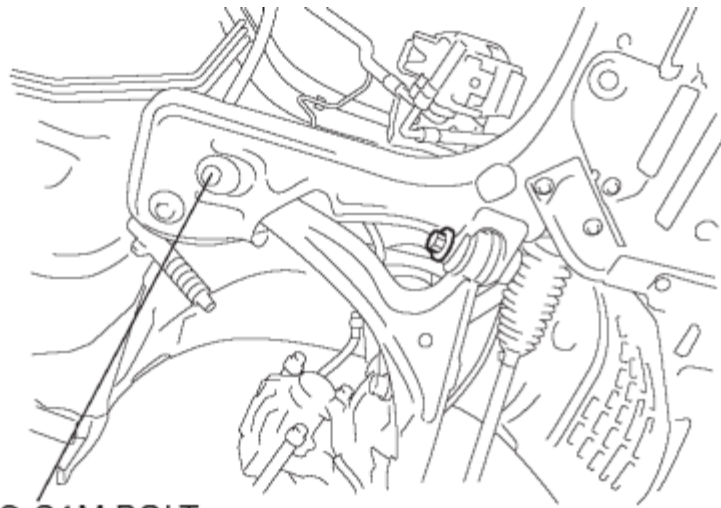
## **Caster Adjustment**

### **CAUTION:**

- Adjust the caster after adjusting the camber.

1. Loosen the installation nut of the adjusting cam bolt (front lower arm rear side).

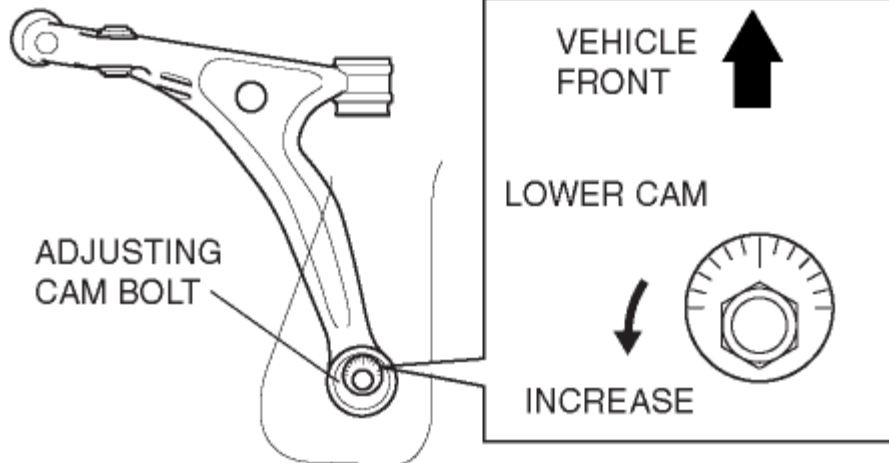




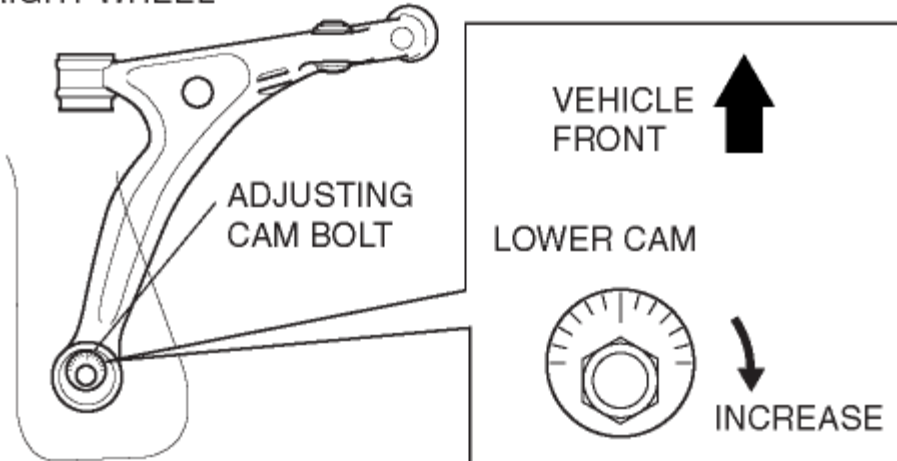
### ADJUSTING CAM BOLT

2. Rotate the adjusting cam bolt in either direction to adjust the caster.

#### LEFT WHEEL



#### RIGHT WHEEL



### Vehicle equipped with 16-inch wheel

Vehicle height *	Caster
354—363 { 14.0—14.2 }	6°27'

364—373 { 14.4—14.6 }	6°13'
374—383 { 14.8—15.0 }	5°59'
384—393 { 15.2—15.4 }	5°45'
394—403 { 15.6—15.8 }	5°31'

### Vehicle equipped with 17-inch wheel

Vehicle height *	Caster
349—358 { 13.8—14.0 }	6°34'
359—368 { 14.2—14.4 }	6°20'
369—378 { 14.6—14.8 }	6°06'
379—388 { 15.0—15.2 }	5°53'
389—398 { 15.4—15.6 }	5°39'

\*

**From the end of the rear fender to the center of the wheel (mm {in})**

	Left wheel	Right wheel
Increase	Counterclockwise	Clockwise
Decrease	Clockwise	Counterclockwise

3. Tighten the nut.

#### **Tightening torque**

- **117.7—137.3 N·m { 12.1—14.0 kgf·m, 86.9—101.2 ft·lbf }**

4. Adjust the camber and total toe-in. (See [Total Toe-in Adjustment](#).)

### **Total Toe-in Adjustment**

1. Loosen the locknut of the tie-rod end.

2. Remove the rack boot clamp.

3. Adjust the total toe-in by rotating each tie rod (left and right) in the opposite directions by the same amount respectively.

#### **Total Toe-in Standard**

- $2 \pm 4 \text{ mm}$  { $0.08 \pm 0.15 \text{ in}$ } ( $0^\circ 11' \pm 21'$ )

#### **NOTE:**

- Toe angle changes by **approx. 3.3 mm {0.13 in}** per one rotation of the tie rod for one wheel.
- Each tie rod has a left-hand thread. When increasing the toe-in angle, rotate the right tie rod toward the rear of the vehicle, and rotate the left tie rod toward the front of the vehicle by the same amount.

4. Tighten the locknut of the tie-rod end.

#### **Tightening torque**

- **68.6—98.0 N·m { 7.00—9.99 kgf·m, 50.6—72.2 ft·lbf }**

5. Verify that the rack boot does not have any twisting, and install the rack boot clamp.

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2008 - MX-5 - Suspension

REAR WHEEL ALIGNMENT

Rear wheel alignment [16-inch wheel]

Item			Specification
Total toe-in	Tire [Tolerance $\pm 4$ mm {0.15 in}]	(mm {in})	3 {0.12}
	Rim inner	(mm {in})	$1.8 \pm 2.4$ {0.071 $\pm$ 0.094}
		degree	0°17'±22'
Camber [Tolerance $\pm 1^\circ$ ]	Vehicle height: From the end of the rear fender to the center of the wheel (mm {in})	354—363 { 14.0—14.2 }	-1°33'
		364—373 { 14.4—14.6 }	-1°18'
		374—383 { 14.8—15.0 }	-1°04'
		384—393 { 15.2—15.4 }	-0°54'
		394—403 { 15.6—15.8 }	-0°45'

Rear wheel alignment [17-inch wheel]

Item			Specification
Total toe-in	Tire [Tolerance $\pm 4$ mm {0.15 in}]	(mm {in})	3 {0.12}
	Rim inner	(mm {in})	$2.2 \pm 2.8$ {0.083 $\pm$ 0.110}
		degree	0°17'±22'

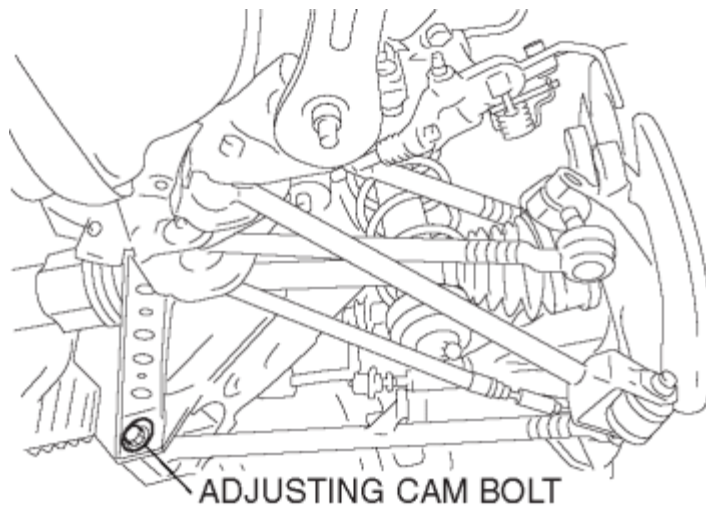
Camber [Tolerance $\pm 1^\circ$ ]	Vehicle height: From the end of the rear fender to the center of the wheel (mm {in})	349—358 { 13.8 —14.0 }	-1°42'
		359—368 { 14.2 —14.4 }	-1°25'
		369—378 { 14.6 —14.8 }	-1°11'
		379—388 { 15.0 —15.2 }	-0°59'
		389—398 { 15.4 —15.6 }	-0°49'

#### NOTE:

- Unloaded vehicle: Fuel tank is full. Engine coolant and engine oil are at specified level. Jack and tools are in designated position.
- Difference between the left and right camber angle is within **1°**.

#### Camber Adjustment

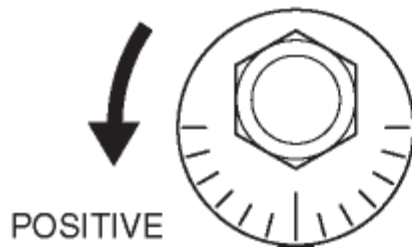
1. Loosen the fixing nut of the adjusting cam bolt (rear lateral link (lower)).



2. Rotate the adjusting cam bolt in either direction to adjust the camber.

## LEFT WHEEL

### FRONT CAM



## RIGHT WHEEL

### FRONT CAM



### Vehicle equipped with 16-inch wheel

Vehicle height *	Camber
354—363 { 14.0—14.2 }	-1°33'
364—373 { 14.4—14.6 }	-1°18'
374—383 { 14.8—15.0 }	-1°04'
384—393 { 15.2—15.4 }	-0°54'
394—403 { 15.6—15.8 }	-0°45'

### Vehicle equipped with 17-inch wheel

Vehicle height *	Camber
349—358 { 13.8—14.0 }	-1°42'
359—368 { 14.2—14.4 }	-1°25'
369—378 { 14.6—14.8 }	-1°11'
379—388 { 15.0—15.2 }	-0°59'
389—398 { 15.4—15.6 }	-0°49'

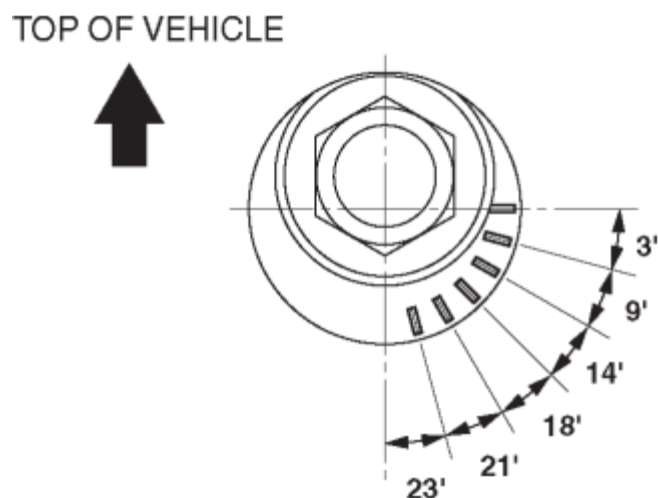
\*: From the end of the rear fender to the center of the wheel (mm {in})

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	Left wheel	Right wheel
Positive direction	Counterclockwise	Clockwise
Negative direction	Clockwise	Counterclockwise

**NOTE:**

- Refer to the figure for the adjusting angle per one graduation.



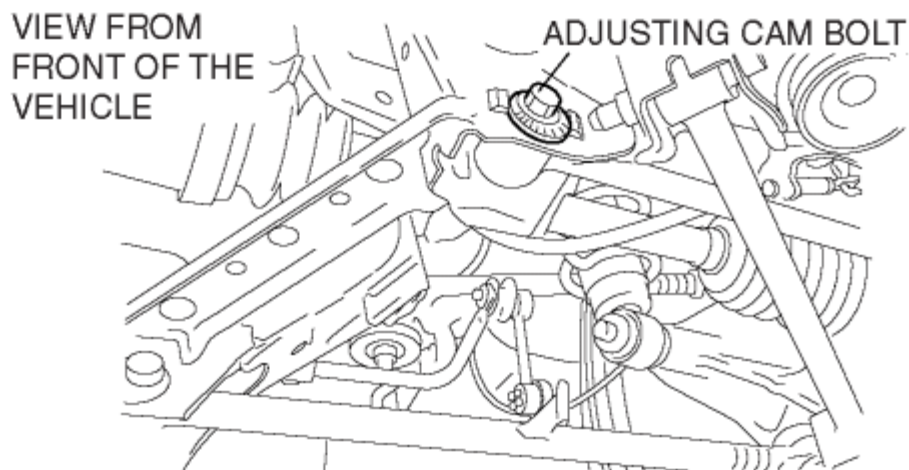
3. Tighten the nut.

**Tightening torque**

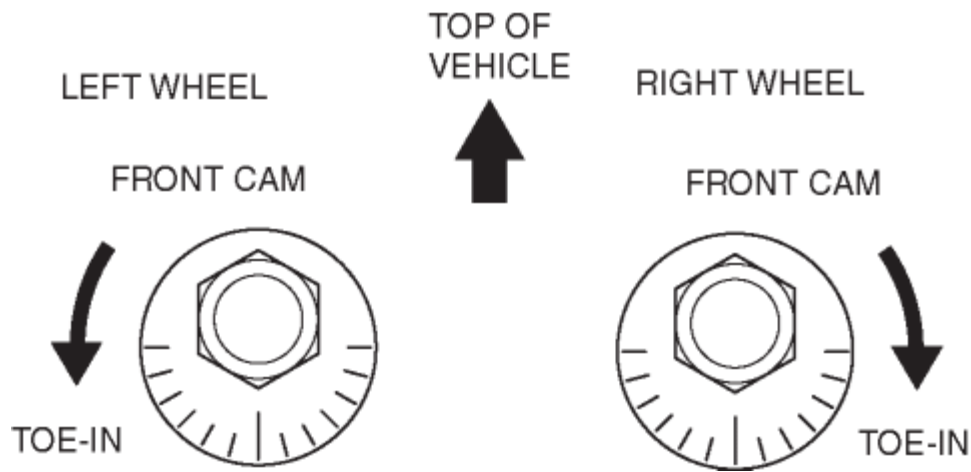
- 117.7—137.3 N·m { 12.1—14.0 kgf·m, 86.9—101.2 ft·lbf }

**Total Toe-in Adjustment**

1. Loosen the installation nut of the adjusting cam bolt.



2. Rotate the adjusting cam bolt in either direction to adjust the toe-in.

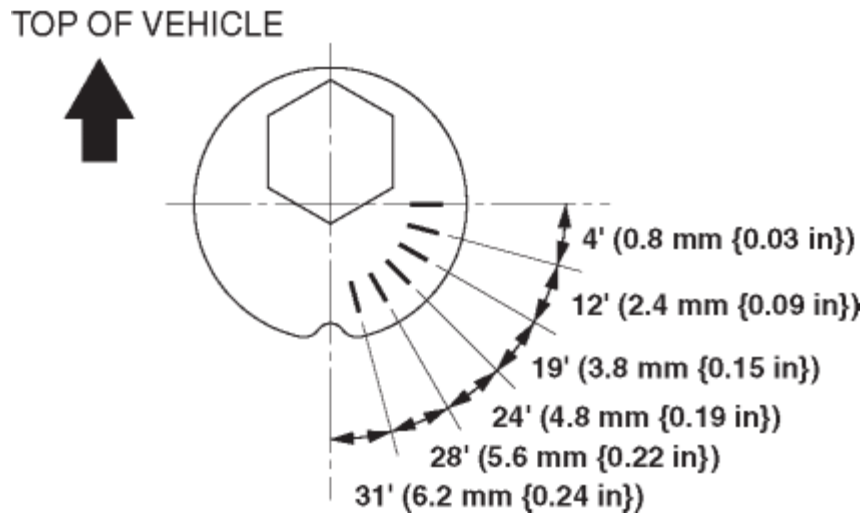


### Standard

- $3 \pm 4$  mm {  $0.08 \pm 0.15$  in } ( $0^\circ 17' \pm 20'$ )

### NOTE:

- Refer to the following figure for the adjusting angle per one graduation of the toe-in gauge.



3. Tighten the nut.

### Tightening torque

- 70—95 N·m { 7.2—9.6 kgf·m, 52—70 ft·lbf }

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2008 - MX-5 - Suspension

WHEEL AND TIRE SPECIFICATION

Wheel and tire

Item			Specification	
Standard tire and wheel				
Wheel	Size		16 × 6 1/2J	17 × 7J
	Offset	(mm {in})	55 {2.17}	
	Pitch circle diameter	(mm {in})	114.3 {4.50}	
	Material		Aluminum alloy	
Tire	Size		205/50R16 87V	205/45R17 84W
	Air pressure (kPa {kgf/cm <sup>2</sup> , psi})	Front	200 {2.0, 29}	
		Rear	200 {2.0, 29}	
	Remaining tread	(mm {in})	1.6 {0.06}	
Wheel and tire	Wheel and tire runout	Radial direction	1.5 {0.06} max.	
	(mm {in})	Lateral direction	2.0 {0.08} max.	
	Wheel imbalance	(g {oz})	Adhesive type*1: 13 {0.46} max. Knock type*2: 8 {0.28} max.	Adhesive type*1: 11 {0.39} max. Knock type*2: 7 {0.25} max.

\*1  
Total weight exceeds 160 g {5.65 oz} .

\*2

One balance weight: 60 g {2.12 oz} max. If the total weight exceeds 100 g {3.53 oz} on one side, rebalance after moving the tire around on the rim. Do not use three or more balance weights.

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## 2008 - MX-5 - Suspension

### WHEEL BALANCE ADJUSTMENT

#### CAUTION:

- Adjust the outer wheel balance first, then the inner wheel balance.
- Be careful not to scratch the wheels.

#### Adhesive-type Balance Weight (Outer)

1. Remove the old balance weight from the wheel.
2. Remove the double-sided adhesive tape remaining on the wheel, then clean and degrease the bonding area.
3. Set the wheel on a wheel balancer, measure the amount of unbalance and the position with the mode set for knock-type balance weight.
4. Multiply the amount of unbalance by **1.6** to obtain the balance weight value.
5. Select a balance weight closest to the weight value and attach the balance weight on the position (outer) indicated by the wheel balancer.

#### Example calculation of balance weight value

- Indicated amount of unbalance: 23 g {0.81 oz}  
 $23 \text{ g } \{0.81 \text{ oz}\} \times 1.6 = 36.8 \text{ g } \{1.30 \text{ oz}\}$
- Selected balance weight value: 35 g {1.24 oz}

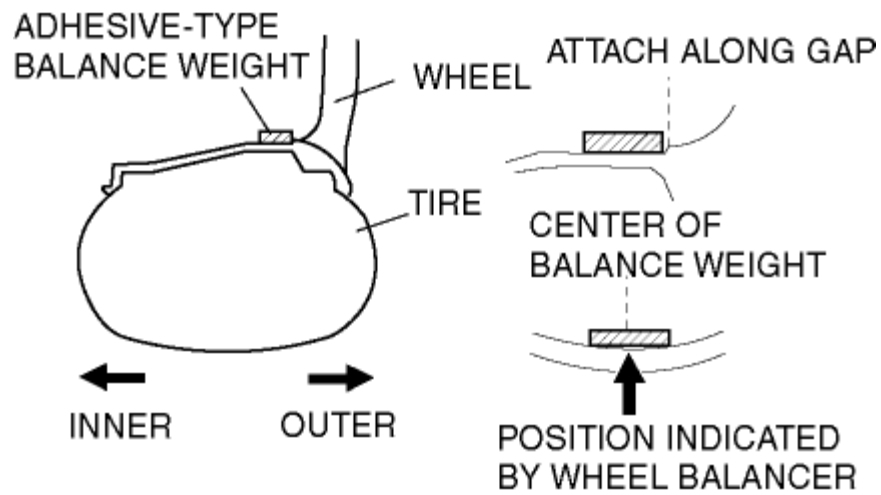
#### NOTE:

- When selecting a balance weight, select one closest to the calculated value.

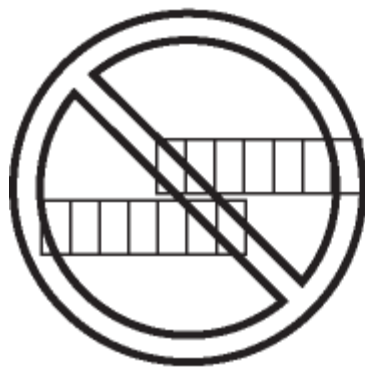
Example: **32.4 g {1.14 oz} = 30 g {1.06 oz}**

#### CAUTION:

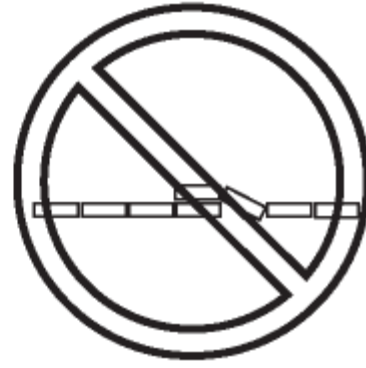
- Use a genuine balance weight or equivalent (steel).
- When attaching the weight, press the weight with a force of 25 N {2.5 kgf, 5.5 lbf} per 5 g for 2 s or more.



6. If attaching tow balance weights, position them so that each is on either side of the position indicated by the wheel balancer.



**NO GOOD**  
(DO NOT ATTACH  
IN A ROW)



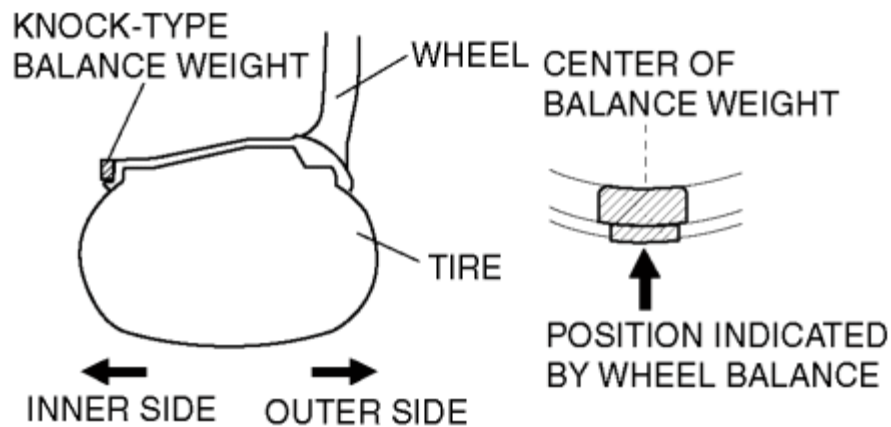
**NO GOOD**  
(DO NOT OVERLAP)

#### CAUTION:

- Do not attach weight balances in a row.
- Do not overlap the balance weights.
- Total weight must not exceed 160 g {5.65 oz}.

#### Knock-type Balance Weight (Inner)

1. Measure the amount of unbalance with a wheel balancer.
2. Attach a weight corresponding to the measured weight value on the position (inner) indicated by the wheel balancer.



#### CAUTION:

- Do not attach three or more balance weights.
- One balance weight must not exceed 60 g {2.12 oz}, and a total of tow balance weights must not exceed 100 g {3.53 oz}.

#### Remaining Amount of Unbalance Confirmation

1. After installing the outer and inner balance weights, operate the wheel balancer again.
2. Confirm that the remaining unbalance does not exceed the following on either side.
  - If the remaining unbalance exceeds the specifications, adjust the wheel balance again.

#### Specifications

	Outer (Adhesive-type)	Inner (Knock-type)
16 inch wheel	13 g {0.46 oz}	8 g {0.28 oz}
17 inch wheel	11 g {0.39 oz}	7 g {0.25 oz}

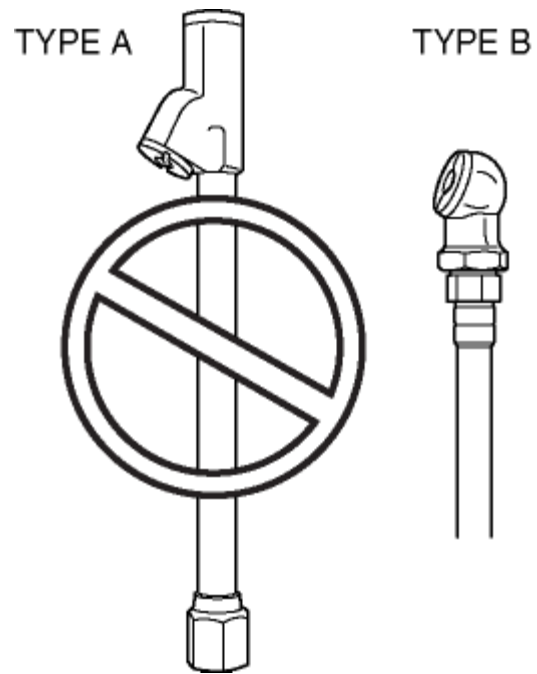
## 2008 - MX-5 - Suspension

### TIRE PRESSURE ADJUSTMENT (WITH TPMS)

1. Use of a digital gauge is recommended for accurate measurement of the air pressure.
2. Tire pressure lowers gradually as time passes. Due to this, monthly air pressure inspection is recommended.
3. Perform tire pressure adjustment before driving. (When tires are cold.)
  - Tire pressure will increase after driving because the internal temperature of the tire is high. If tire pressure is adjusted to specifications when the internal temperature of the tire is high, tire pressure will decrease when the internal temperature of the tire decreases to the same level as ambient temperature. If the tire pressure is lower than the lower-limit pressure, the TPMS warning light may illuminate.
  - Even though the air pressure is adjusted to specifications, the indicated air pressure may be higher than the specified value when the internal temperature of the tire is higher than ambient temperature. (Example: Air pressure changes approx. **10 kPa {0.1 kgf/cm<sup>2</sup>, 1.5 psi}** when the temperature changes **10 °C {50 °F}**)

### CAUTION:

- In an area or a season with varying temperatures, tire pressure will change due to ambient temperature change. If the tire pressure is lower than the lower-limit pressure due to low ambient temperature, the TPMS warning light may illuminate. Adjust the pressure when the TPMS warning light illuminates.
- Do not tilt or use excessive side force when checking air pressure or inflating the tire with air. Which can provide enough leverage to easily bend or break the wheel unit.
- To prevent damage to the valve area of the wheel unit or pressure loss during air pressure adjustment, use a type B tool with a round end as shown in the figure, not a type A tool.



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## 2008 - MX-5 - Suspension

### WHEEL UNIT ID REGISTRATION

**NOTE:**

- After the wheel unit replacement, registration of the wheel unit identification codes must be performed.
- ID registration can be done using the M-MDS, or not using the M-MDS.

**Using M-MDS**

1. After the vehicle is identified, select the following items from the initial screen of the M-MDS.
  - This function is available for only the IDS (laptop PC).
    - Select the "Body" tab.
    - Select the "TPMS Functions".
    - Select the "Wheel Unit ID Registration".
    - Select the "WU\_ID Registration".

**CAUTION:**

- If performing the procedure alone, never drive the vehicle while checking the M-MDS screen. When performing the ID registration, record each data on the screen before driving, and verify that the ID numbers have changed after driving.

**NOTE:**

- When the vehicle is driven, the four ID numbers in the bold cell of the chart change at the same time the ID registration finishes.

	WU 1	WU 2	WU 3	WU 4
ID Number (Stored)	<b>0xAAAAAAAA</b>	<b>0xBBBBBBBB</b>	<b>0xCCCCCCCC</b>	<b>0xDDDDDDDD</b>
ID Number (Candidate)	0x00000000	0x00000000	0x00000000	0x00000000
Tire Pressure (Stored)	aaaKPa	bbbKPa	cccKPa	dddKPa
Tire pressure (Candidate)	0KPa	0KPa	0KPa	0KPa

2. Leave the vehicle with the engine off for **15 min or more**.



3. Verify that the TPMS warning light turns on and off in **0.5 s** cycles repeatedly.
4. Drive the vehicle at a speed of **25 km/h { 15.5 mph} or more** for **10 min** to implement the wheel unit ID registration.

**NOTE:**

- If the ID registration is not completed even after driving the vehicle for **10 min or more** at a speed of **25 km/h { 15.5 mph} or more**, the TPMS warning light flashes.

5. Verify that the TPMS warning light turns off.

**NOTE:**

- If the wheel unit ID registration cannot be performed after driving **10 min or more**, refer to the symptom troubleshooting procedure.

### **Without Using M-MDS**

1. Turn the ignition switch to the ON position, then turn it off.
2. Leave the vehicle with the engine off for **15 min or more**.
3. Drive the vehicle at a speed of **25 km/h { 15.5 mph} or more** for **10 min or more**.
4. After driving for **10 min**, verify that the TPMS warning light does not flash and is not illuminated.

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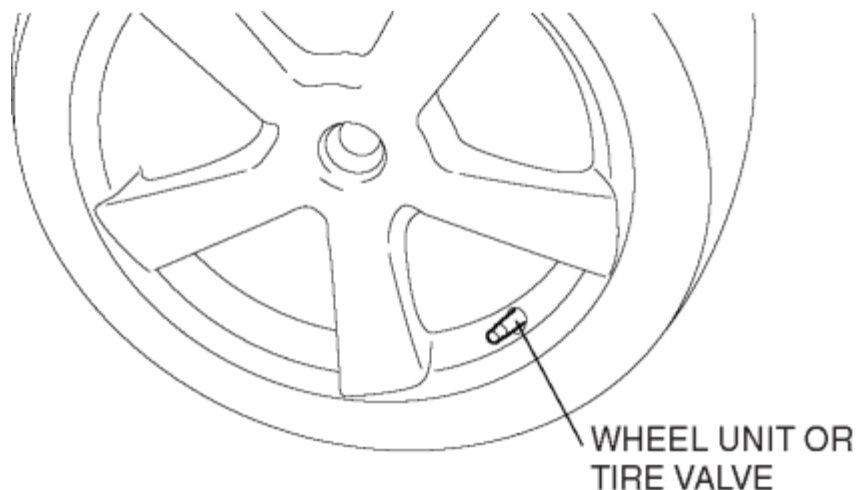
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## 2008 - MX-5 - Suspension

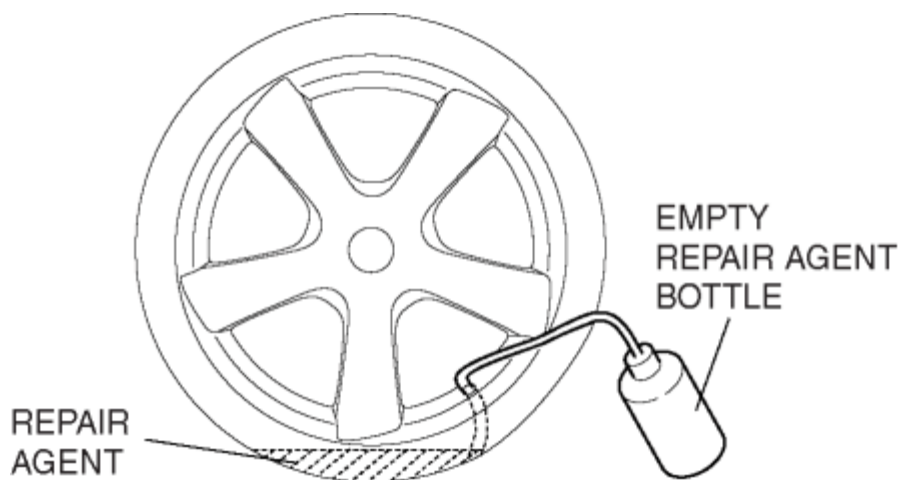
### REPAIR AGENT REMOVAL

#### CAUTION:

- Be careful not to spill the repair agent from inside of the tire.
1. Remove the flat tire from the vehicle, and let the air out of the tire.
  2. Remove the wheel unit nut and push the remaining part of the wheel valve into the tire (with TPMS). Cut the tire valve by the root and push the remaining part of the wheel into the tire (without TPMS).



3. Insert the hose through the valve and into the tire. Stand the tire up so that the hose end sinks into the repair agent.



4. Pump out the repair agent.

#### NOTE:

- Place the tire on a higher stand than the pumping bottle. This will make the operation easier.

5. Repeat the pumping procedure, changing the position of the hose end, until there is no repair agent left in the tire.
6. Remove the tire from the wheel and pick the wheel unit pushed in at Step 2 out.
7. Wipe off the repair agent remaining on the wheel, wheel unit and tire.

**NOTE:**

- Dispose of waste repair agent according to local disposal law.
- The repair agent is composed of the following:
  - Deproteinized natural rubber latex
  - Emulsified adhesive resin
  - Propylene glycol
- The tire must be replaced with a new one and clean all tire repair agent off to the wheel.
- Use compressed air to clean out TPMS style valve.

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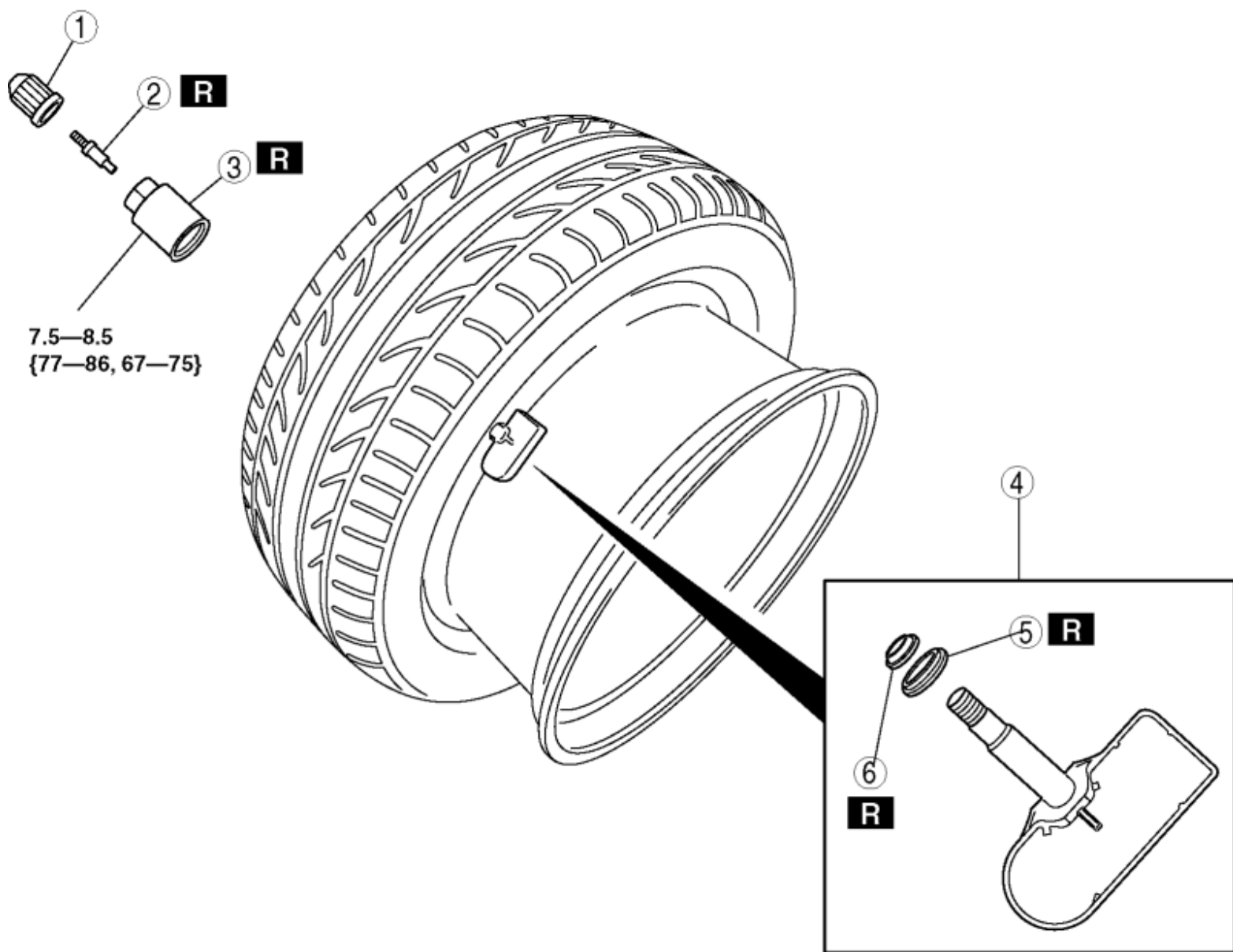
## 2008 - MX-5 - Suspension

### WHEEL UNIT REMOVAL/INSTALLATION

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. When replacing wheel unit (s), register the new wheel unit ID (s). (See [WHEEL UNIT ID REGISTRATION](#).)

#### NOTE:

- If the wheel unit is replaced with a new one, the ID registration must be performed. When the ID registration is finished, the data for the new wheel unit is displayed on the M-MDS.



N·m {kgf·cm, in·lbf}

1	Valve cap
2	Valve core (See <a href="#">Valve Core Removal Note.</a> )
3	Valve nut and washer
4	Wheel unit (See <a href="#">Wheel Unit Removal Note.</a> ) (See <a href="#">Wheel Unit Installation Note.</a> )
5	Seal washer

### Valve Core Removal Note

1. Remove the valve core of the wheel unit, and bleed the air from the tire.

### Wheel Unit Removal Note

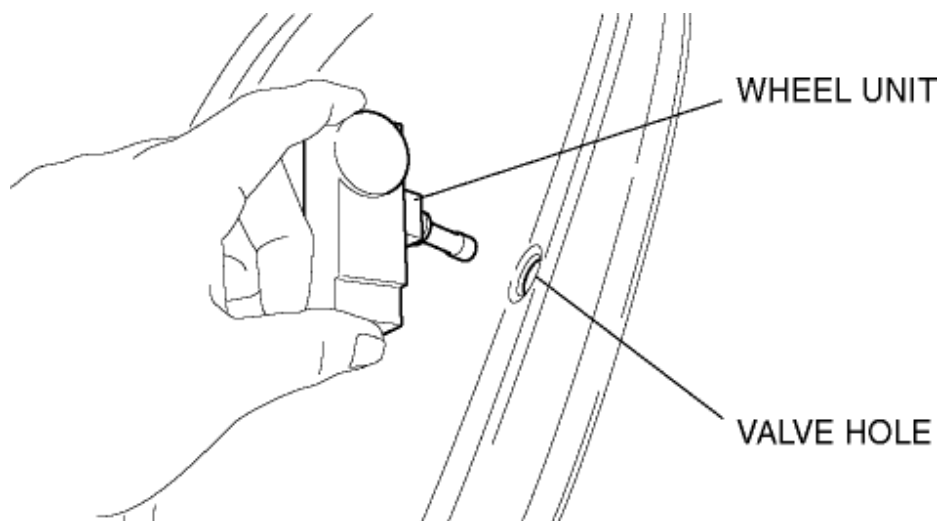
1. Push the tire valve completely into the tire.

#### CAUTION:

- Breaking the tire bead with the wheel unit installed normally could damage the unit. Be sure to always push the wheel unit so that it is completely inside the tire to prevent any damage.
2. Position the shoe (bead breaker) of the tire changer **10—20 mm {0.40—0.78 in}** from the outer edge of the wheel, and break both tire beads.
  3. Remove the bead from one side of the wheel.
  4. Remove the wheel unit.

### Wheel Unit Installation Note

1. Insert the wheel unit valve into the valve hole so that the polyurethane foam side faces the rim.



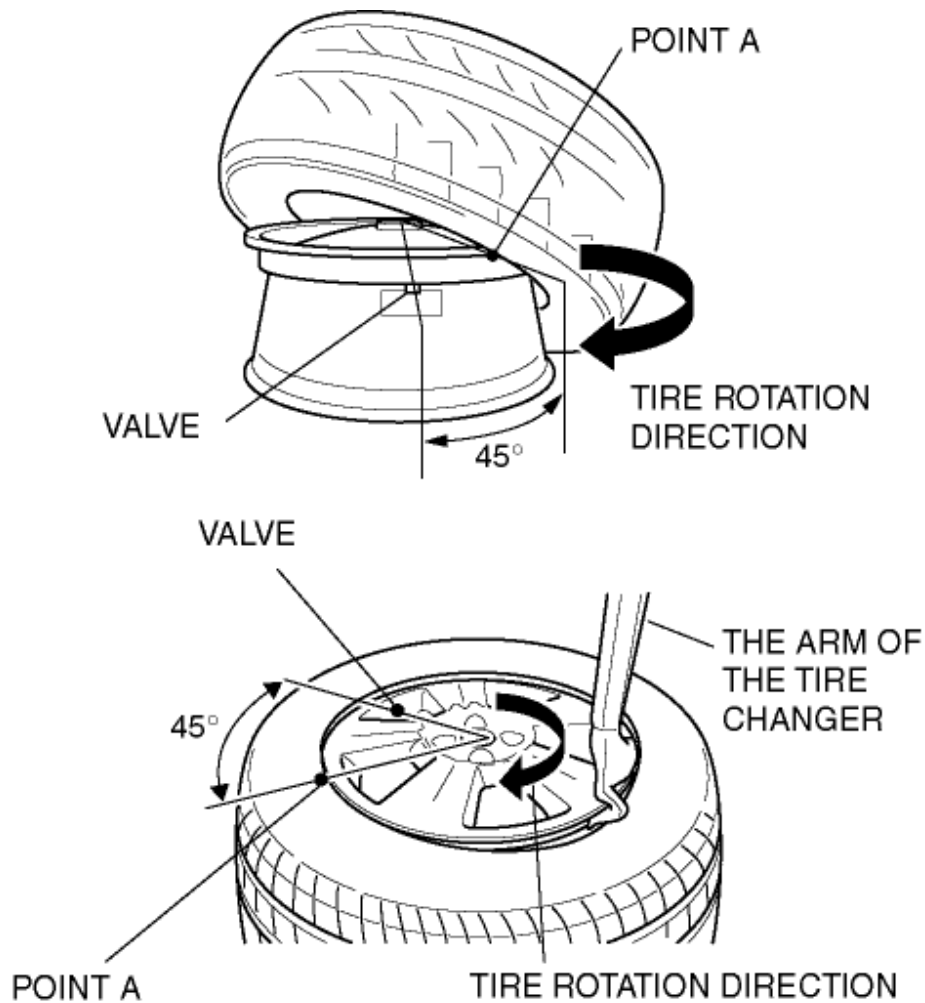
#### NOTE:

- Maintain the wheel unit in contact with the rim, then start manually to screw the valve nut for a few turns.
2. Install the nut from the outer side of the wheel.
  3. Tighten the valve nut slowly (**15 rpm max.**) to **8.0 N·m {82 kgf·cm, 71 in·lbf}** in one rotation.

**CAUTION:**

- Do not retighten the valve nut after the initial operation.

4. Set the tire changer so that it is **45°** away (point A) from the valve hole.



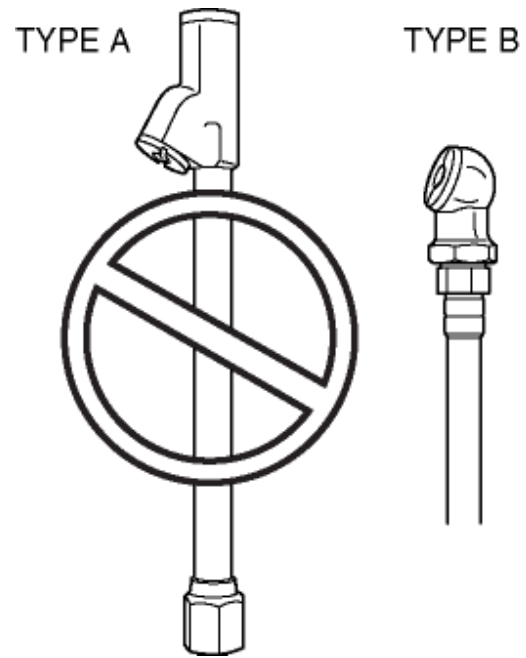
**CAUTION:**

- Do not position the tire changer near the tire valve to avoid any damage to the wheel unit.

5. Fill the tire with air and verify the valve nut tightening torque.

**CAUTION:**

- To prevent damage to the valve area of the wheel unit or charging loss during air pressure adjustment, use a type B tool with a round end as shown in the figure, not a type A tool.



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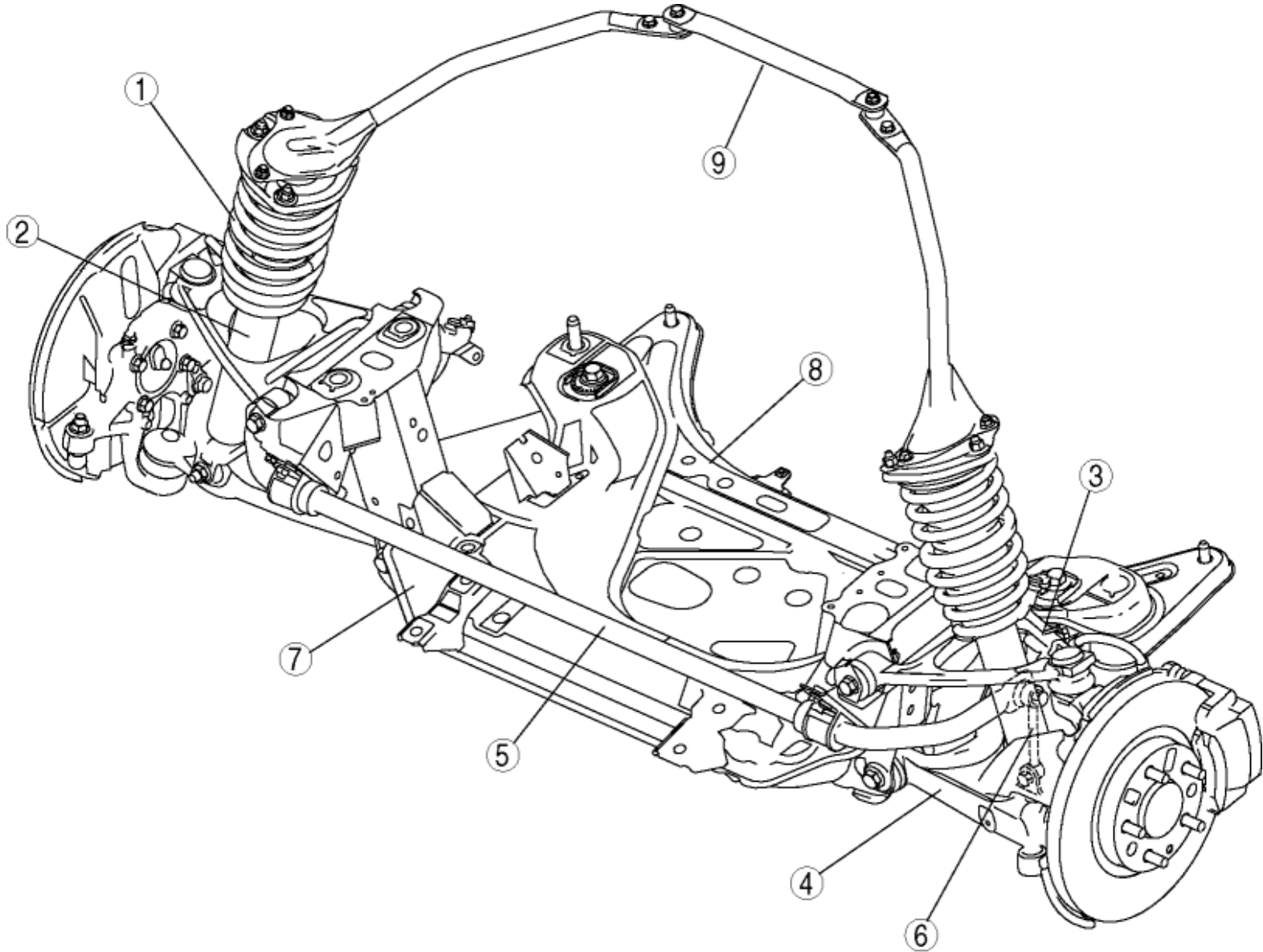
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## 2008 - MX-5 - Suspension

### FRONT SUSPENSION LOCATION INDEX



1 Front shock absorber and coil spring

(See [FRONT SHOCK ABSORBER AND COIL SPRING REMOVAL/INSTALLATION.](#))

(See [FRONT SHOCK ABSORBER AND COIL SPRING DISASSEMBLY/ASSEMBLY.](#))

2 Front shock absorber

(See [FRONT SHOCK ABSORBER INSPECTION.](#))

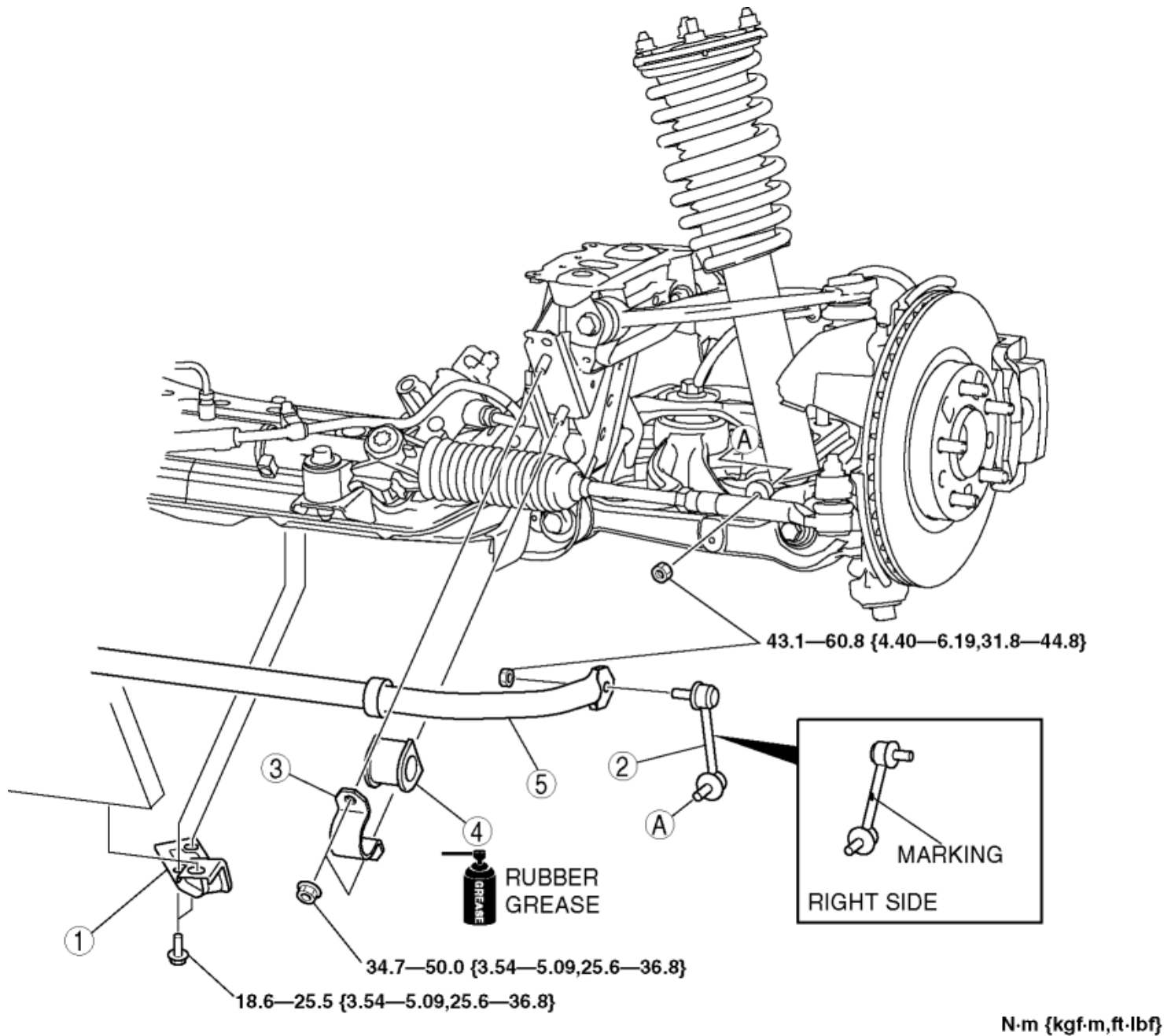
	(See <a href="#">FRONT SHOCK ABSORBER DISPOSAL.</a> )
3	Front upper arm (See <a href="#">FRONT UPPER ARM REMOVAL/INSTALLATION.</a> ) (See <a href="#">FRONT UPPER ARM INSPECTION.</a> )
4	Front lower arm (See <a href="#">FRONT LOWER ARM REMOVAL/INSTALLATION.</a> ) (See <a href="#">FRONT LOWER ARM INSPECTION.</a> )
5	Front stabilizer (See <a href="#">FRONT STABILIZER REMOVAL/INSTALLATION.</a> )
6	Stabilizer control link (See <a href="#">FRONT STABILIZER CONTROL LINK INSPECTION.</a> )
7	Front crossmember (See <a href="#">FRONT CROSSMEMBER REMOVAL/INSTALLATION.</a> )
8	Transverse member (See <a href="#">TRANSVERSE MEMBER REMOVAL/INSTALLATION.</a> )
9	Front suspension tower bar (See <a href="#">FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION.</a> )

## 2008 - MX-5 - Suspension

### FRONT STABILIZER REMOVAL/INSTALLATION

#### CAUTION:

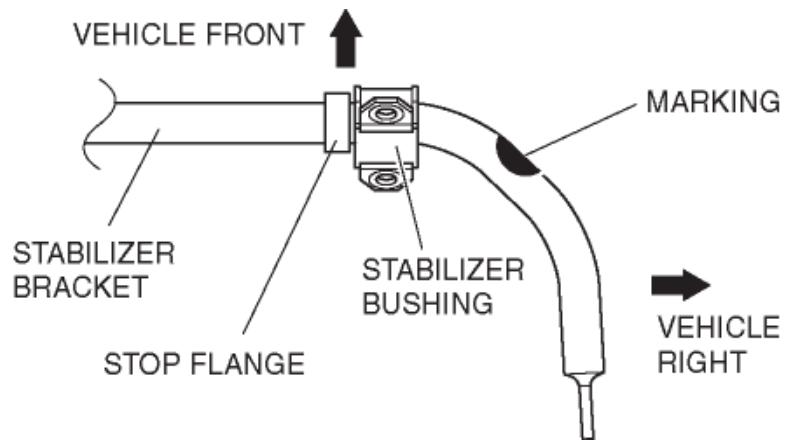
- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the wiring harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled while servicing the vehicle.
- Remove in the order indicated in the table.
  - Install in the reverse order of removal.



1	Radiator mount bracket
2	Stabilizer control link
3	Stabilizer bracket (See <b>Stabilizer Bracket Installation Note.</b> )
4	Stabilizer bushing
5	Front stabilizer

### Stabilizer Bracket Installation Note

1. Apply rubber grease to the inner side of the stabilizer bushing.
2. Align the outer side of the stabilizer slide stopper with the stabilizer bushing.
3. Install the stabilizer bracket.



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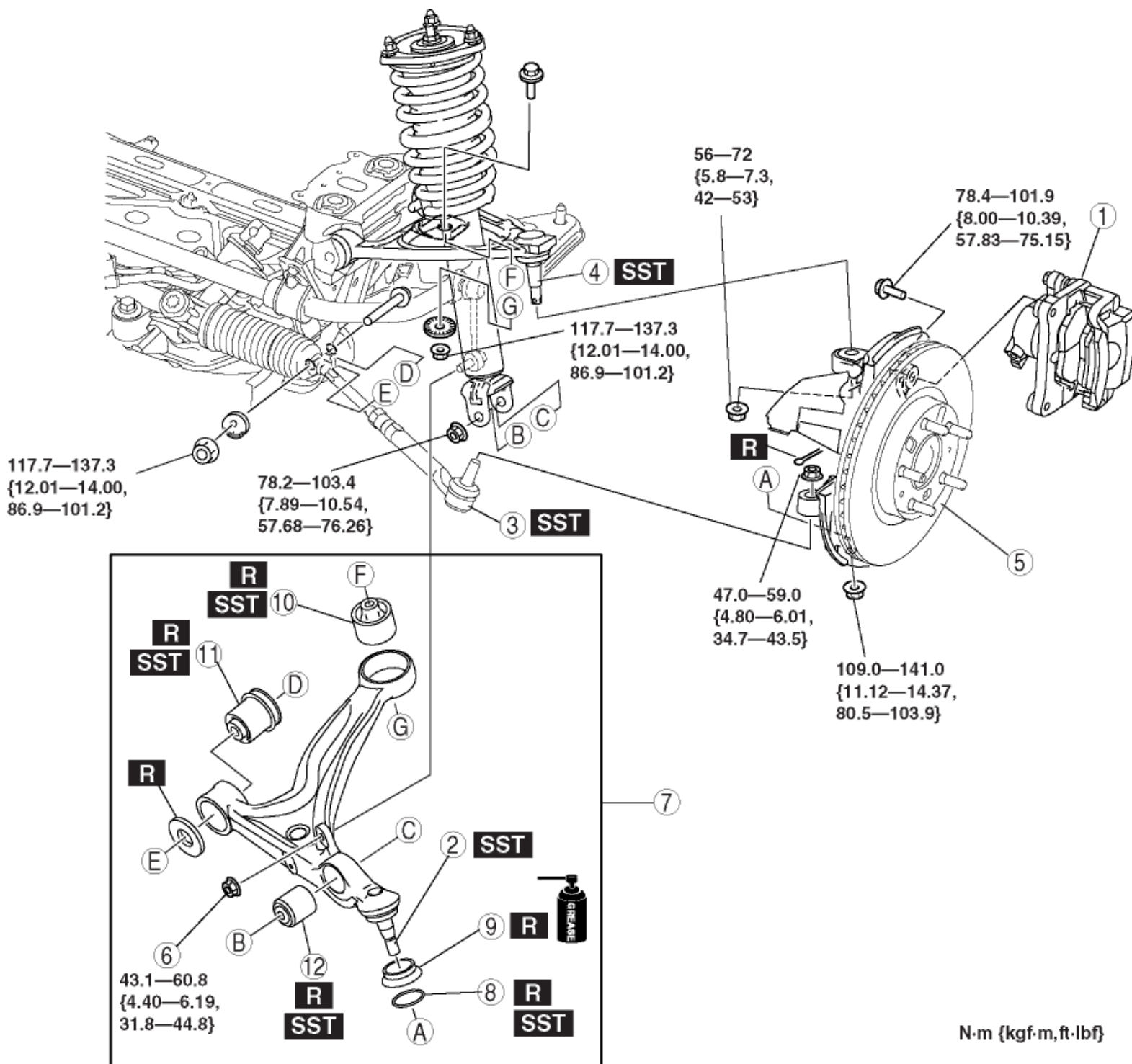
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## 2008 - MX-5 - Suspension

### FRONT LOWER ARM REMOVAL/INSTALLATION

#### CAUTION:

- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the wiring harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled while servicing the vehicle.
1. Remove in the order indicated in the table.
  2. Install in the reverse order of removal.



1 Caliper and mounting support

(See [Caliper and Mounting Support Removal Note.](#))

2 Front lower arm ball joint

(See [Front Lower Arm Ball Joint Removal Note.](#))

3 Tie-rod end

(See [STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION.](#))

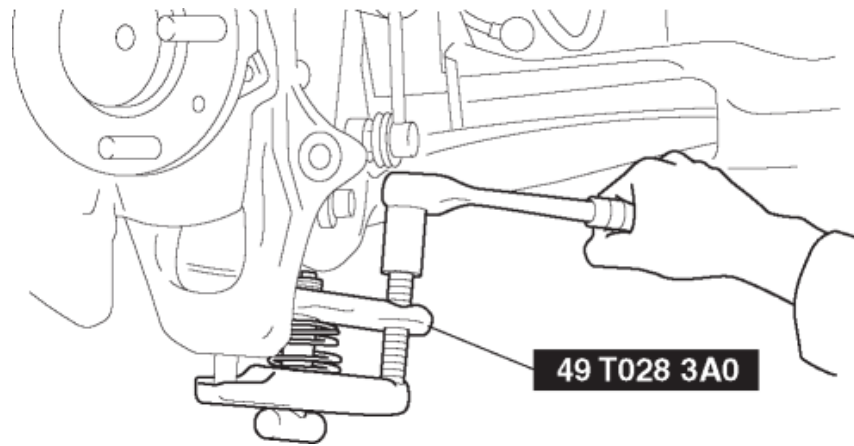
4	Front upper arm ball joint (See <a href="#">Front Upper Arm Ball Joint Removal Note.</a> )
5	Front hub and steering knuckle component
6	Stabilizer control link nut (front lower arm side)
7	Front lower arm (See <a href="#">Front Lower Arm Installation Note</a> )
8	Clip (See <a href="#">Clip Installation Note.</a> )
9	Dust boot
10	Bushing (rear side) (See <a href="#">Bushing (Rear Side) Removal Note.</a> ) (See <a href="#">Bushing (Rear Side) Installation Note.</a> )
11	Bushing (front side) (See <a href="#">Bushing (Front Side) Removal Note.</a> ) (See <a href="#">Bushing (Front Side) Installation Note.</a> )
12	Bushing (shock absorber lower side connecting part) (See <a href="#">Bushing (Shock Absorber Lower Side Connecting Part) Removal Note.</a> ) (See <a href="#">Bushing (Shock Absorber Lower Side Connecting Part) Installation Note.</a> )

### Caliper and Mounting Support Removal Note

1. Remove the caliper and mounting support from the steering knuckle and suspend it with a cable in a location out of the way.

### Front Lower Arm Ball Joint Removal Note

1. Disconnect the front lower arm ball joint from the steering knuckle using the **SST**.

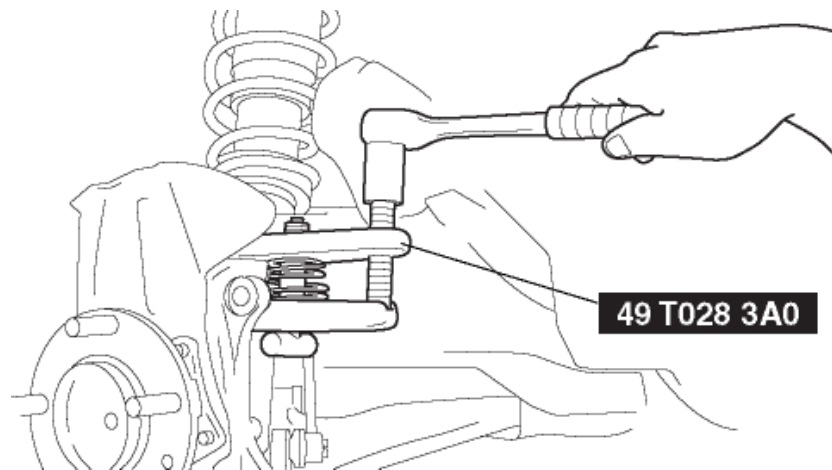


**NOTE:**

- When removing the front lower arm ball joint, the steering knuckle bushing may also come off. If it comes off, replace the steering knuckle.

**Front Upper Arm Ball Joint Removal Note**

1. Loosen the bolts on the vehicle side.
2. Disconnect the upper arm ball joint using the **SST**.

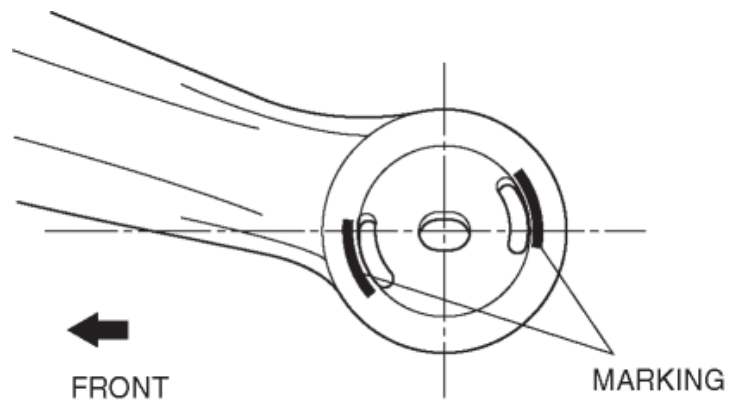


**Bushing (Rear Side) Removal Note**

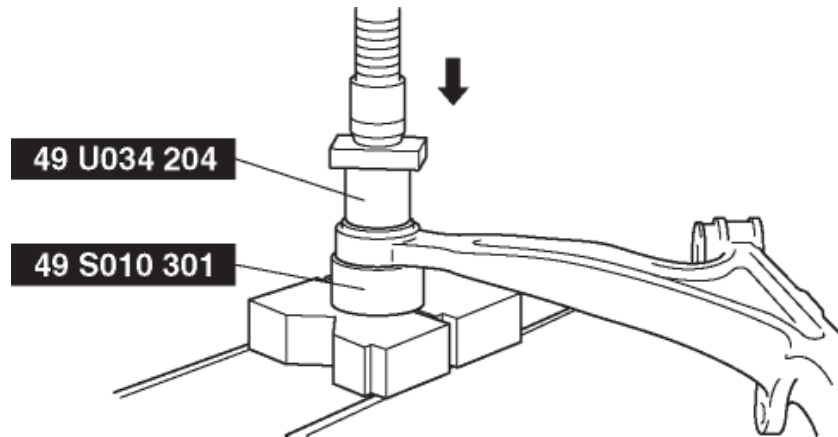
**CAUTION:**

- Be careful not to damage the front lower arm. If it is damaged, replace it.
1. Mark the front upper arm as shown in the figure.





2. Remove the bushing using the **SSTs**.

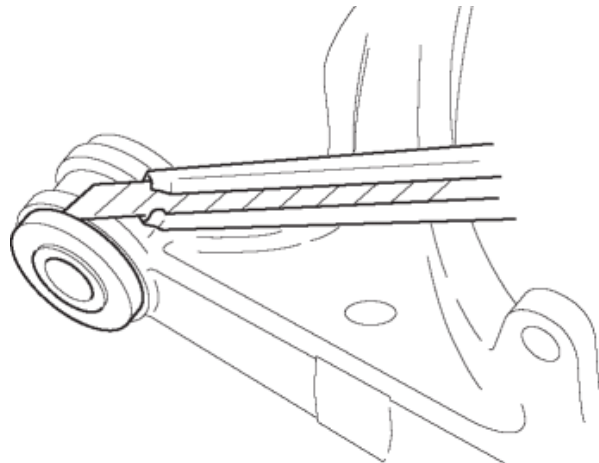


### Bushing (Front Side) Removal Note

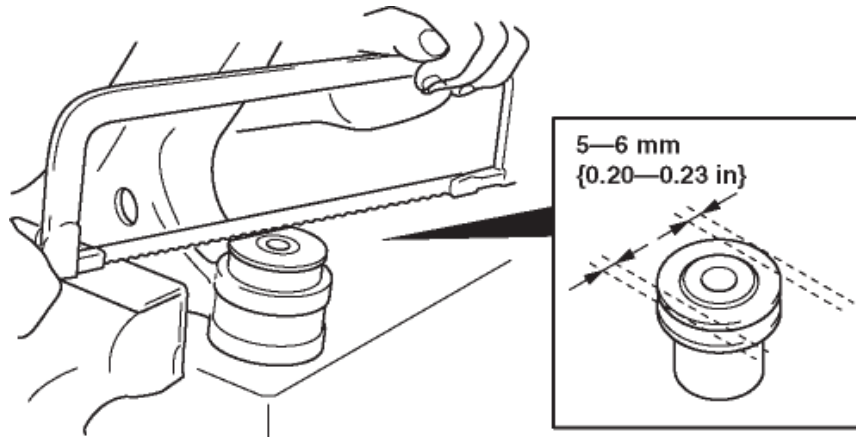
#### CAUTION:

- Be careful not to damage the front lower arm. If it is damaged, replace it.

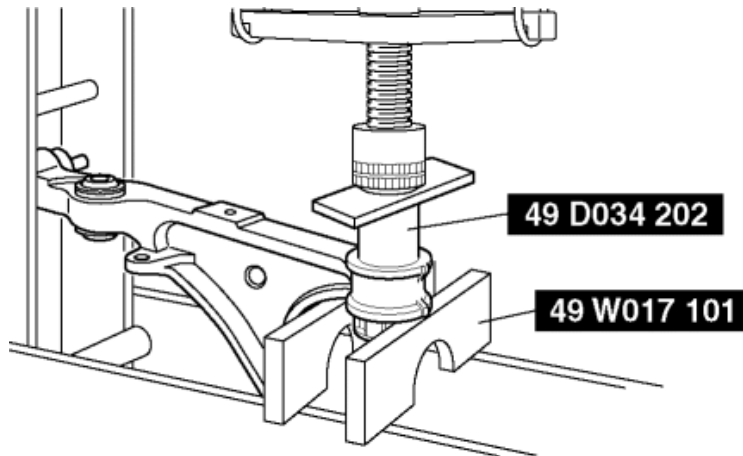
1. Cut off the stopper plate rubber using a razor.



2. Cut off **5—6 mm {0.20—0.23 in}** from each side of the knob end of the bushing using a hacksaw.



3. Remove the bushing using the **SSTs**.

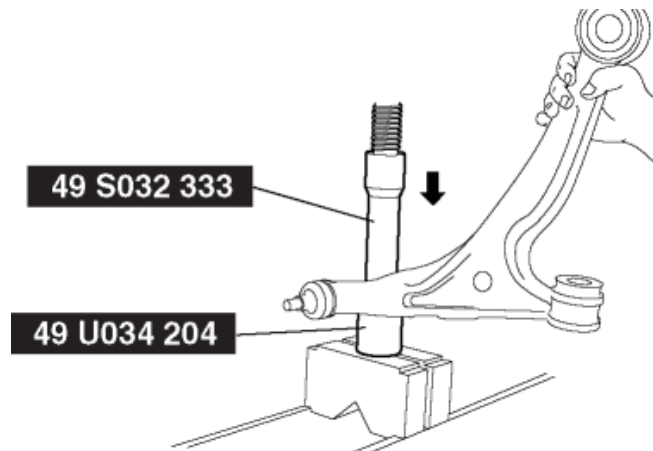


### Bushing (Shock Absorber Lower Side Connecting Part) Removal Note

#### CAUTION:

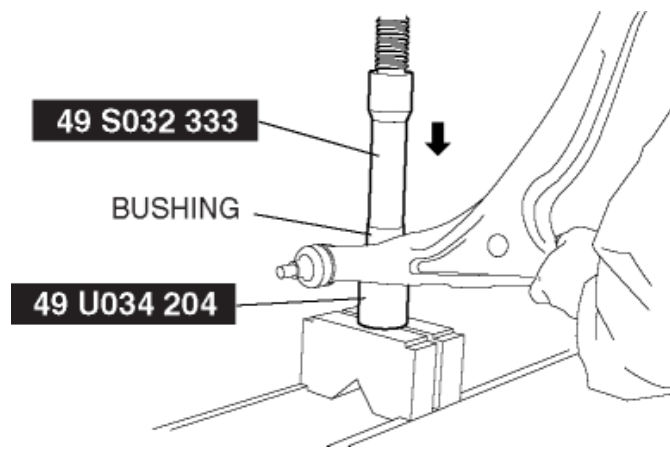
- Be careful not to damage the front lower arm. If it is damaged, replace it.

1. Remove the bushing using the **SSTs**.



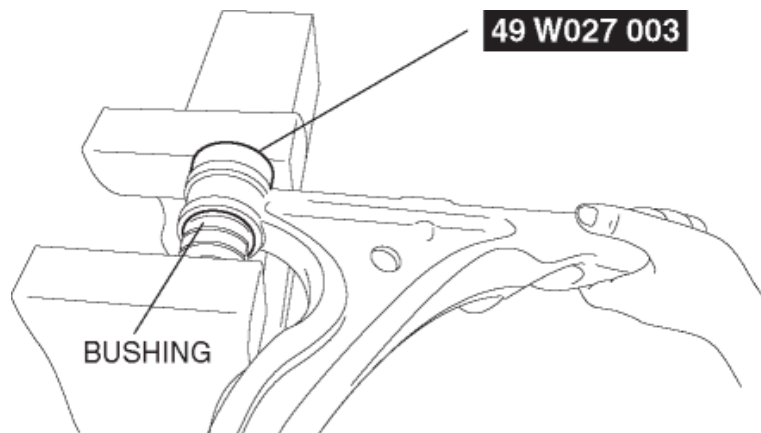
### Bushing (Shock Absorber Lower Side Connecting Part) Installation Note

1. Compress the bushing using the **SSTs**.

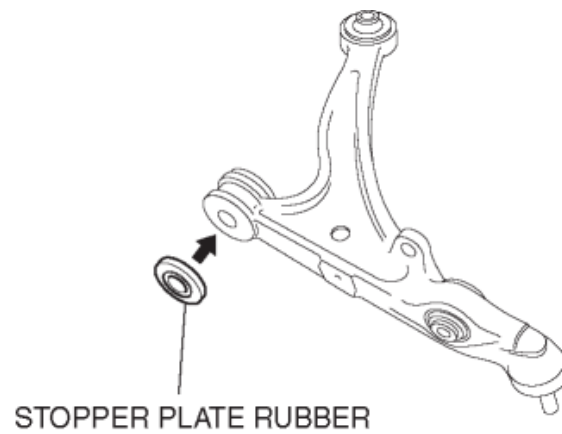


### Bushing (Front Side) Installation Note

1. Press the bushing in using the **SSTs**.

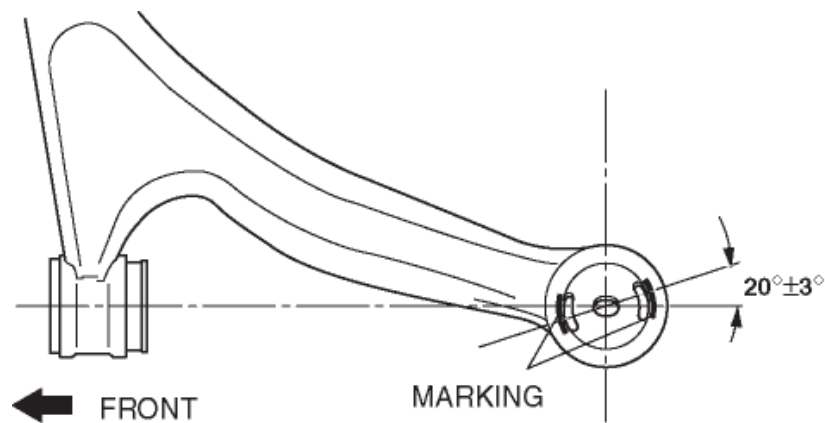


2. Insert the stopper plate rubber into the inner pipe of the bushing (front side).

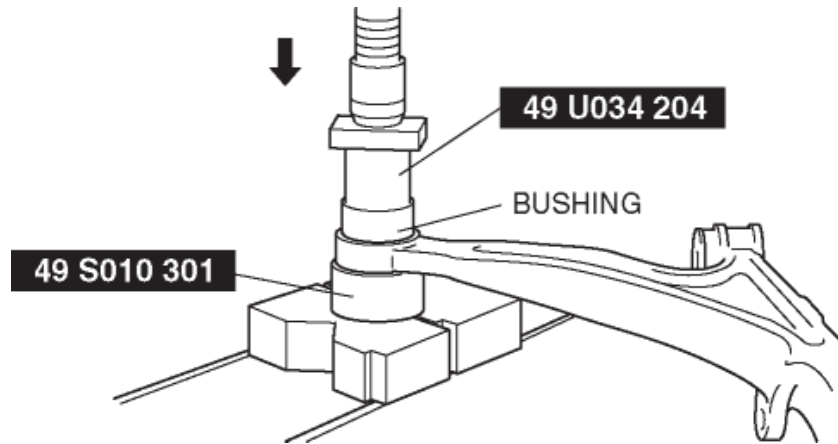


### Bushing (Rear Side) Installation Note

1. Align the marks placed during removal and install the bushing.

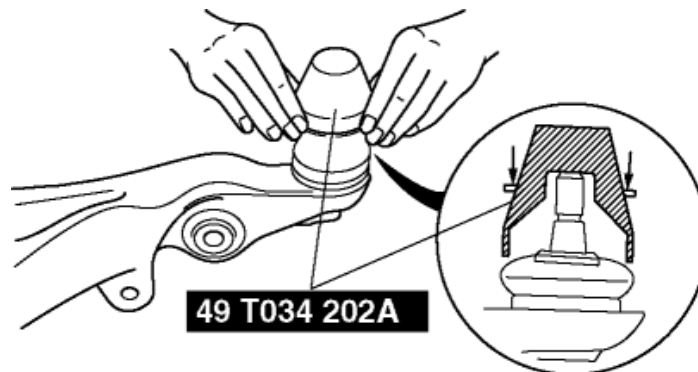


2. Press the bushing in using the **SSTs**.



### Clip Installation Note

1. Wipe the grease off the ball joint stud.
2. Fill the inside of the new dust boot with grease.
3. Install the dust boot to the ball joint.
4. Install the clip using the **SST**.



5. Verify that the clip is installed securely to the groove.
6. Wipe off any excess grease.

### Front Lower Arm Installation Note

1. Install the front lower arm rear side bushing part horizontally.

2. Install the front lower arm front side bushing part.

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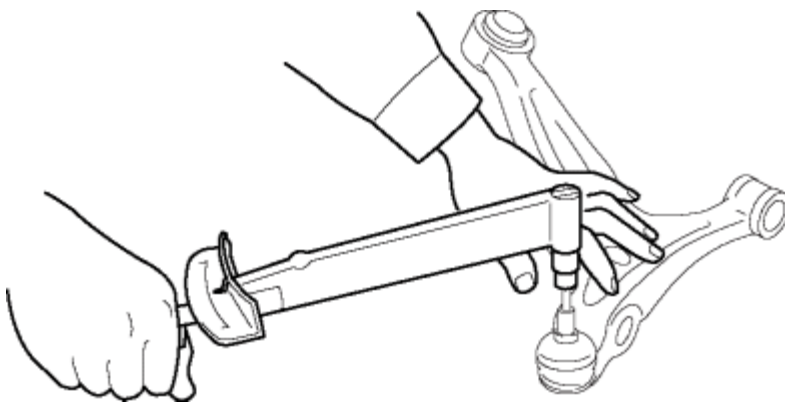
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## 2008 - MX-5 - Suspension

### FRONT LOWER ARM INSPECTION

1. Remove the front lower arm from the vehicle. (See [FRONT LOWER ARM REMOVAL/INSTALLATION](#).)
2. Inspect the front lower arm for bending or damage. If there is any malfunction, replace it.
3. Inspect the ball joint for excessive play. If there is any malfunction, replace the front lower arm.
4. Rotate the ball joint **5 times**.
5. Measure the ball-joint rotational torque using an Allen wrench and a torque wrench.



#### Front lower arm ball joint rotational torque

- 0.4—2.9 N·m {5—29 kgf·cm, 4—25 in·lbf}
- If not within the specification, replace the front lower arm. (See [FRONT LOWER ARM REMOVAL/INSTALLATION](#).)

## 2008 - MX-5 - Suspension

### FRONT SHOCK ABSORBER INSPECTION

1. Remove the front shock absorber.
2. Inspect for damage and oil leakage.
3. Compress and extend the shock absorber piston rod at least three times at a steady speed. From the fourth compression stroke, verify that the operational force does not change and that there is no unusual noise.
  - If there is any malfunction, replace the shock absorber.

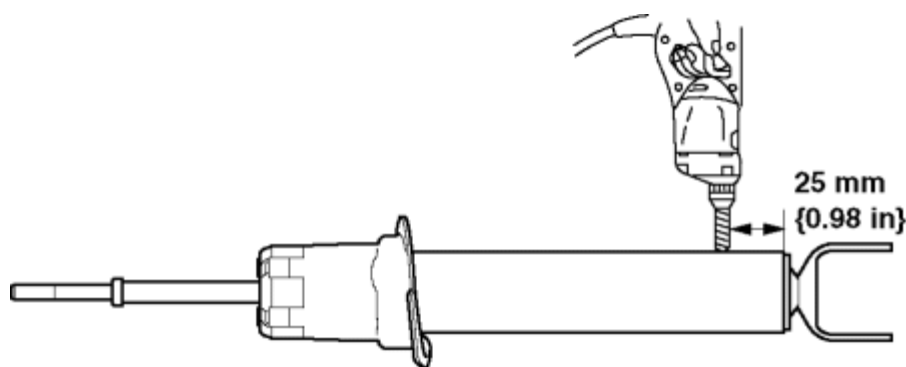
## 2008 - MX-5 - Suspension

### FRONT SHOCK ABSORBER DISPOSAL

#### WARNING:

- Whenever drilling into a shock absorber, wear protective eye wear. The gas in the shock absorber is pressurized, and could spray metal chips into the eyes and face when drilling.

1. Clamp the shock absorber on a flat surface.
2. Drill a **2—3 mm {0.08—0.12 in}** hole at a point **25 mm {0.98 in}** from the bottom of the tube, so that the gas can escape.



3. Turn the hole downwards.
4. The oil can be collected by moving the piston rod several times up and down and cutting the tube at the end.
5. Dispose of waste oil according to local waste disposal law.

#### NOTE:

- Shock absorber gas contains nitrogen gas.
- Shock absorber oil contains mineral oil.

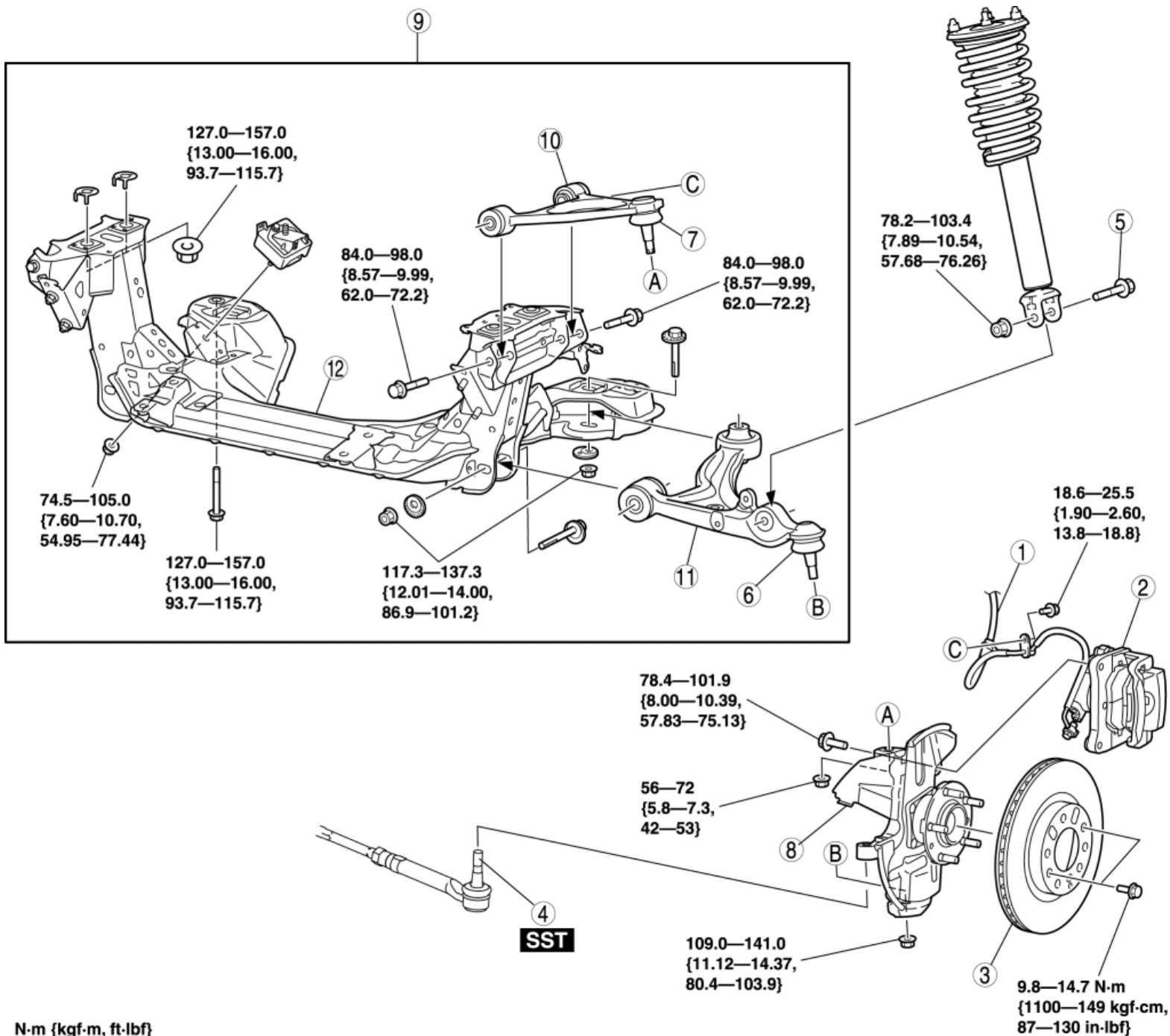


## 2008 - MX-5 - Suspension

### FRONT CROSSMEMBER REMOVAL/INSTALLATION

#### CAUTION:

- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the wiring harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled while servicing the vehicle.
1. Remove the front suspension tower bar. (See [FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION](#).)
  2. Remove the front stabilizer (See [FRONT STABILIZER REMOVAL/INSTALLATION](#).)
  3. Remove the transverse members (See [TRANSVERSE MEMBER REMOVAL/INSTALLATION](#).)
  4. Remove the steering gear and linkage, and suspend it using a cable.
  5. Remove in the order indicated in the table.
  6. Install in the reverse order of removal.
  7. Inspect the front wheel alignment. (See [FRONT WHEEL ALIGNMENT](#).)



1	Brake hose
2	Caliper and mounting support
3	Disc plate
4	Tie-rod end (See <a href="#">STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION.</a> )
5	Shock absorber bolt (lower)
6	Front lower arm bolt joint (See <a href="#">FRONT LOWER ARM REMOVAL/INSTALLATION.</a> )

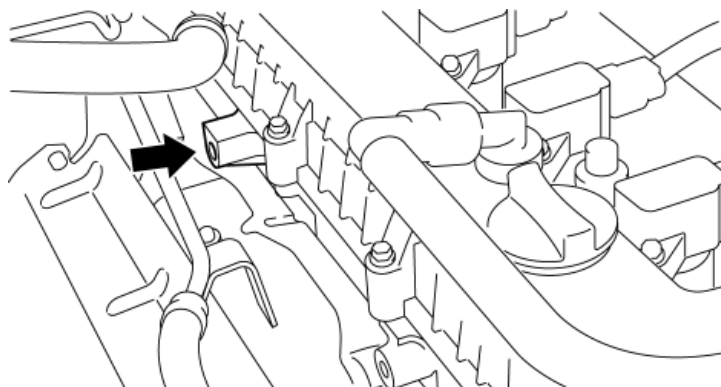
7	Front upper arm ball joint (See <a href="#">FRONT LOWER ARM REMOVAL/INSTALLATION.</a> )
8	Axle and hub component (See <a href="#">Axle and Hub Component Removal Note.</a> )
9	Front crossmember component (See <a href="#">Front Crossmember Component Removal Note.</a> )
10	Front upper arm
11	Front lower arm
12	Front crossmember

### Axle and Hub Component Removal Note

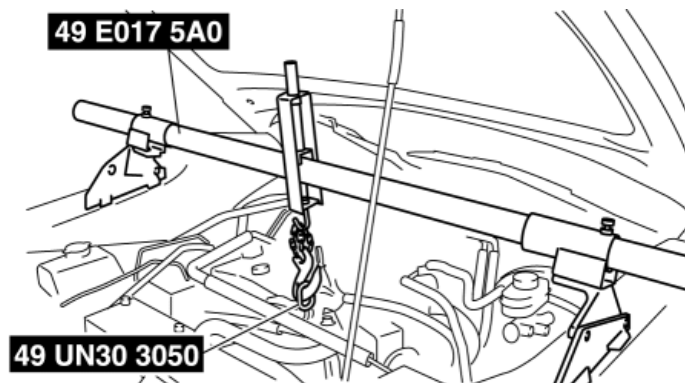
1. Loosen the front upper arm inner bolts.
2. Remove the axle and hub component.

### Front Crossmember Component Removal Note

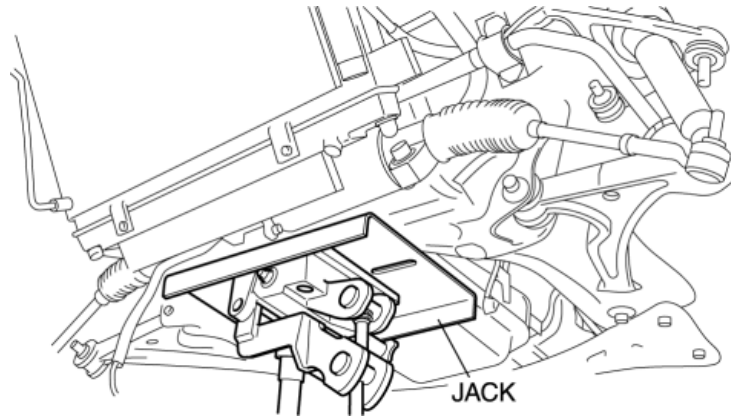
1. Secure the chain to install the **SST** to the position shown in the figure using the bolts (**M10 x 1.5**, length **30 mm {1.18 in}**).



2. Suspend the engine.



3. Support the front crossmember using a jack.



**WARNING:**

- Verify that the crossmember component is securely supported by a jack. If the crossmember component falls, it could cause serious injury or death, or damage to the vehicle.

4. Lower the front crossmember component slightly.
5. Remove the engine mounting rubber, pipes and hoses installed to the front crossmember.
6. Remove the front crossmember component.

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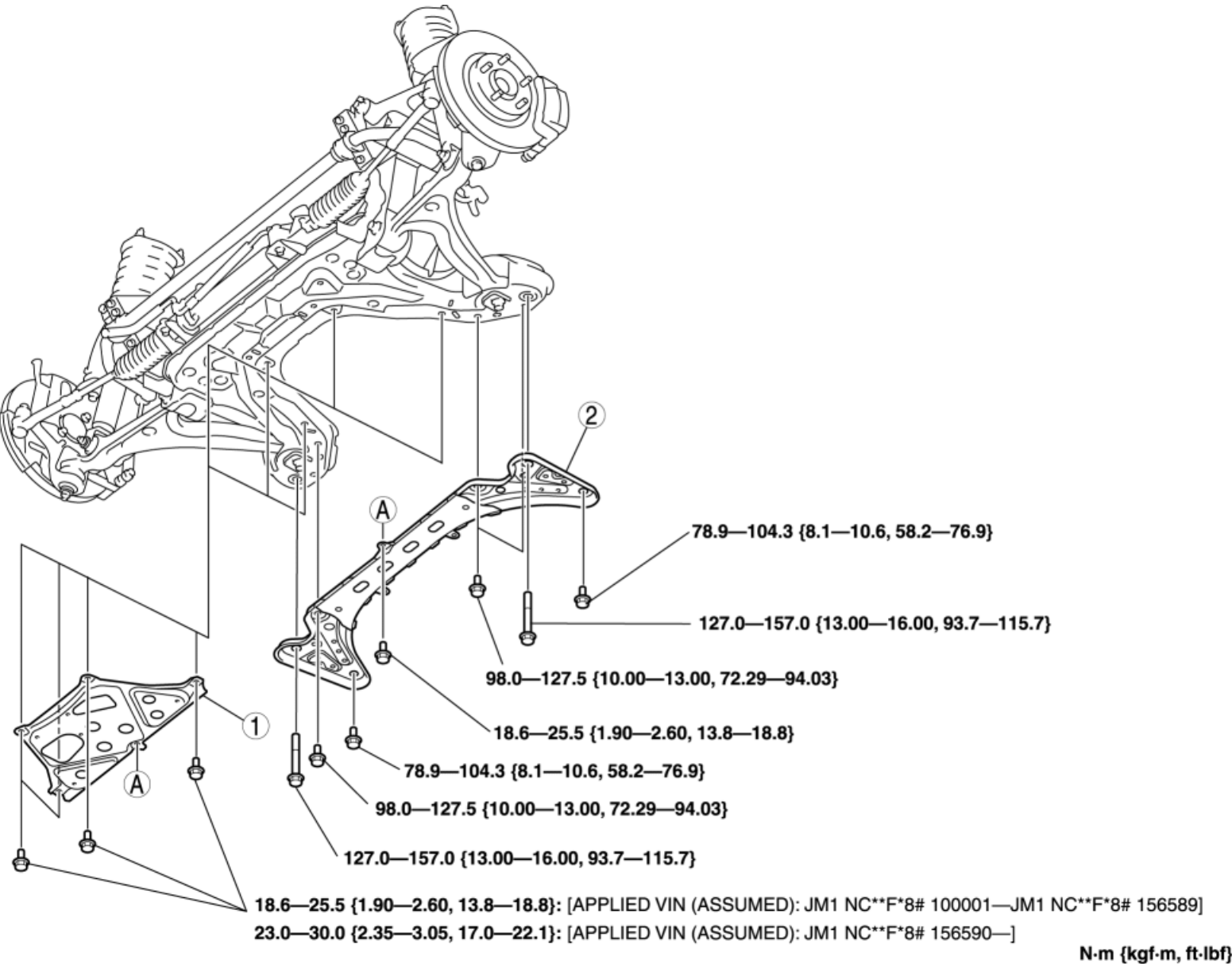
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2008 - MX-5 - Suspension

TRANSVERSE MEMBER REMOVAL/INSTALLATION

- 1. Remove in the order indicated in the table.
- 2. Install in the reverse order of removal.



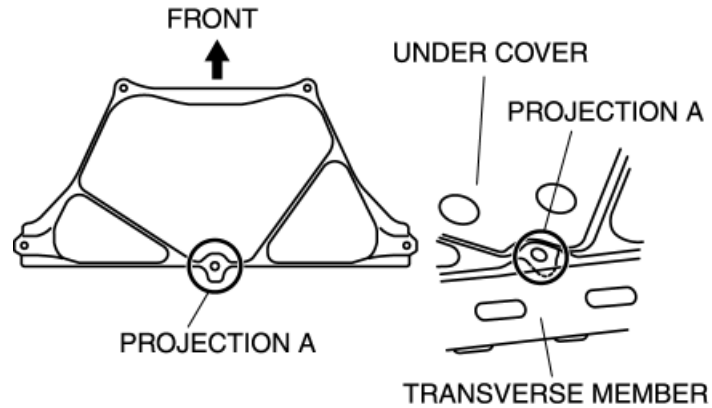
1	Under cover (See <a href="#">Under Cover Installation Note.</a> )
2	Transverse member (See <a href="#">Transverse Member Removal Note.</a> )

### Transverse Member Removal Note

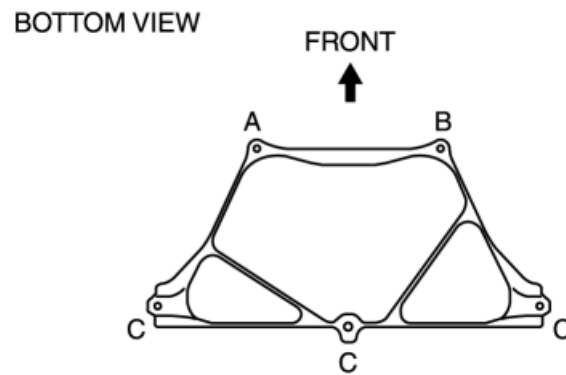
1. Support the crossmember using a jack.
2. Remove the transverse member.

### Under Cover Installation Note

1. Align projection A with the transverse member opening to temporarily support the under cover.



2. Tighten the bolts in the order of A, B and C.



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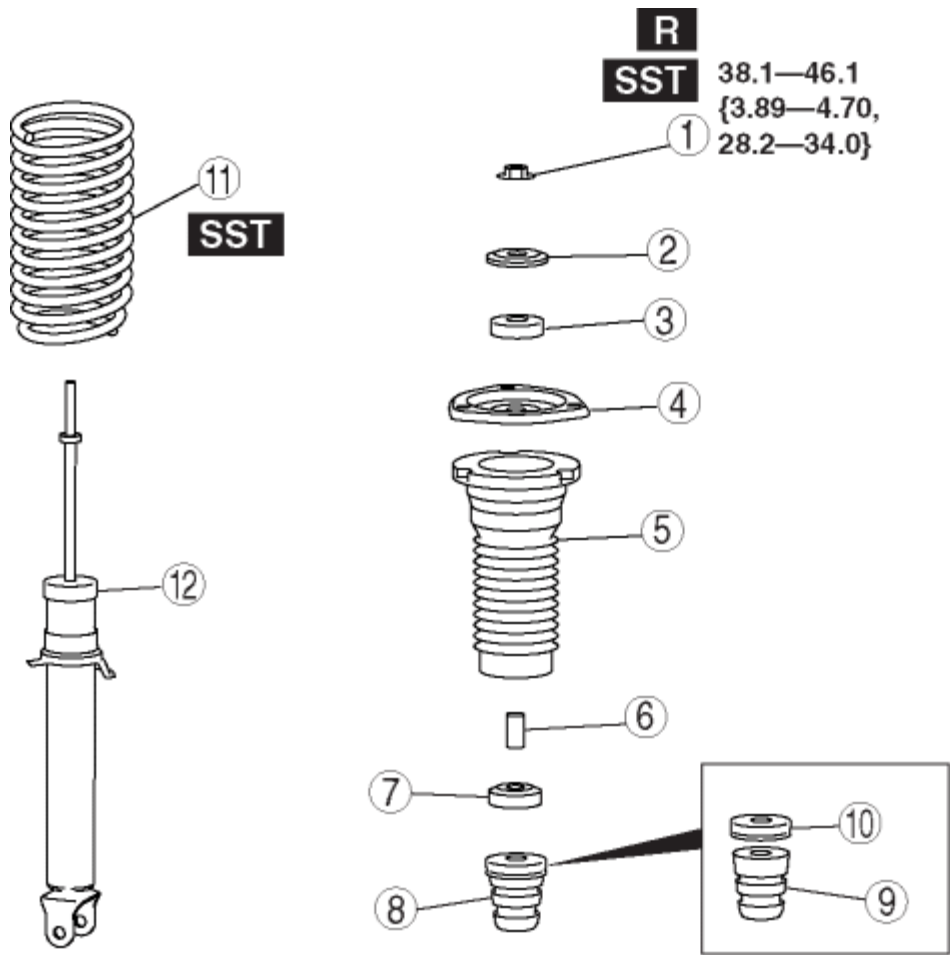
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2008 - MX-5 - Suspension

FRONT SHOCK ABSORBER AND COIL SPRING DISASSEMBLY/ASSEMBLY

WARNING:

- Removing/installing the shock absorber and coil spring is dangerous. The shock absorber and coil spring could fly off and cause serious injury or death, and damage the vehicle.
1. Remove the front shock absorber and coil spring. (See **FRONT SHOCK ABSORBER AND COIL SPRING REMOVAL/INSTALLATION.**)
  2. Remove in the order indicated in the table.
  3. Install in the reverse order of removal.



N·m {kgf·m, ft·lbf}

1 Piston rod nut

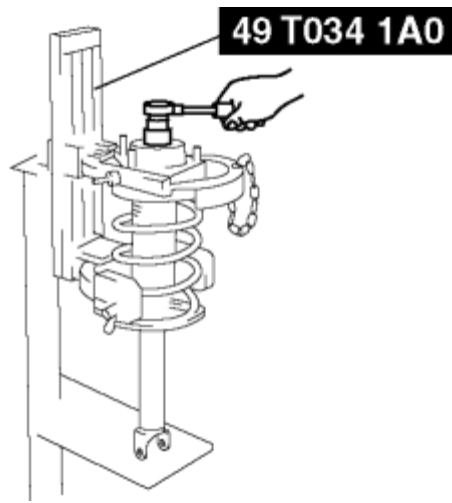
	(See <b>Piston Rod Nut Removal Note.</b> )
2	Retainer
3	Bushing
4	Upper spring seat (See <b>Upper Spring Seat Installation Note.</b> )
5	Dust boot
6	Spacer
7	Bushing
8	Stopper casing and bound stopper
9	Bound stopper
10	Stopper casing
11	Coil spring (See <b>Coil Spring Installation Note.</b> )
12	Front shock absorber

**Piston Rod Nut Removal Note**

**WARNING:**

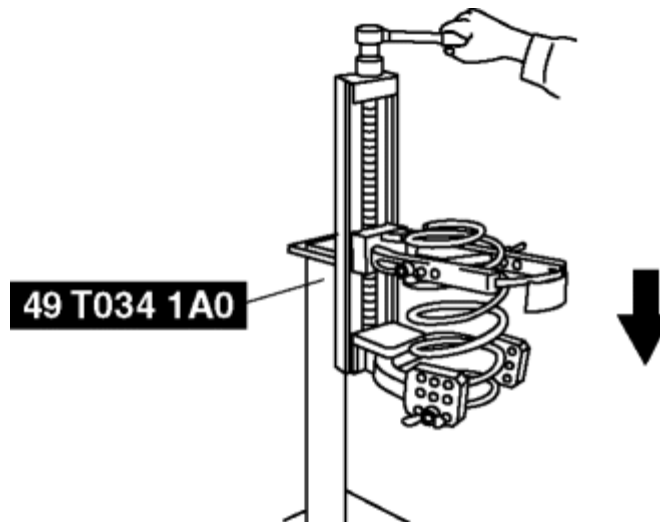
- Before removing the piston rod nut, secure the shock absorber and spring in the SSTs. Otherwise, the shock absorber and spring could fly off under tremendous pressure and cause serious injury or death, or damage to vehicle parts.
1. Protect the coil spring from scratches using a piece of cloth and install the **SSTs**.
  2. Compress the coil spring using the **SSTs** and remove the piston rod nut.





### Coil Spring Installation Note

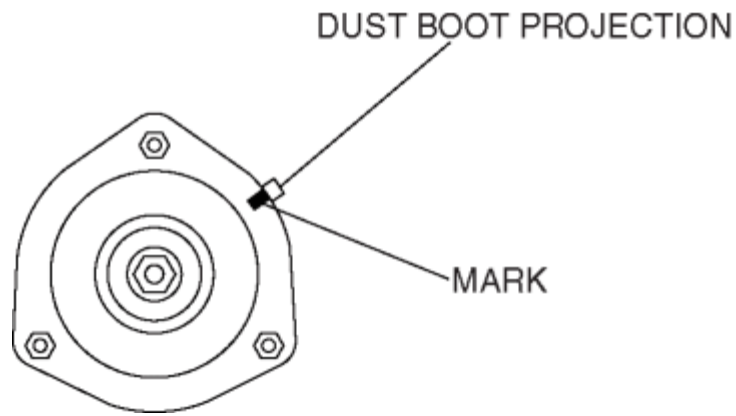
1. Protect the coil spring from scratches using a piece of cloth and install the **SSTs**.
2. Compress the coil spring using the **SSTs**.



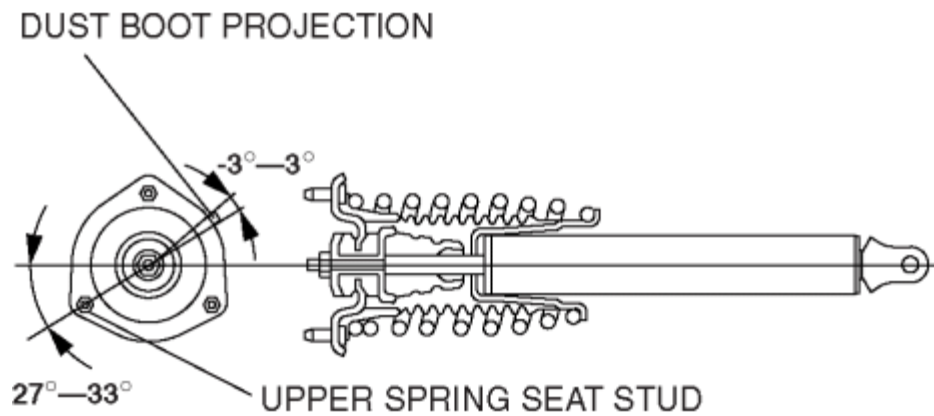
3. Install the shock absorber so that the lower end of the coil spring is seated on the step of the lower spring seat.

### Upper Spring Seat Installation Note

1. Align the mark on the upper spring seat with the dust boot projection.



2. Install the upper spring seat so that the upper spring seat stud is at a **27°—33°** angle to the shock absorber installation shaft (lower side).



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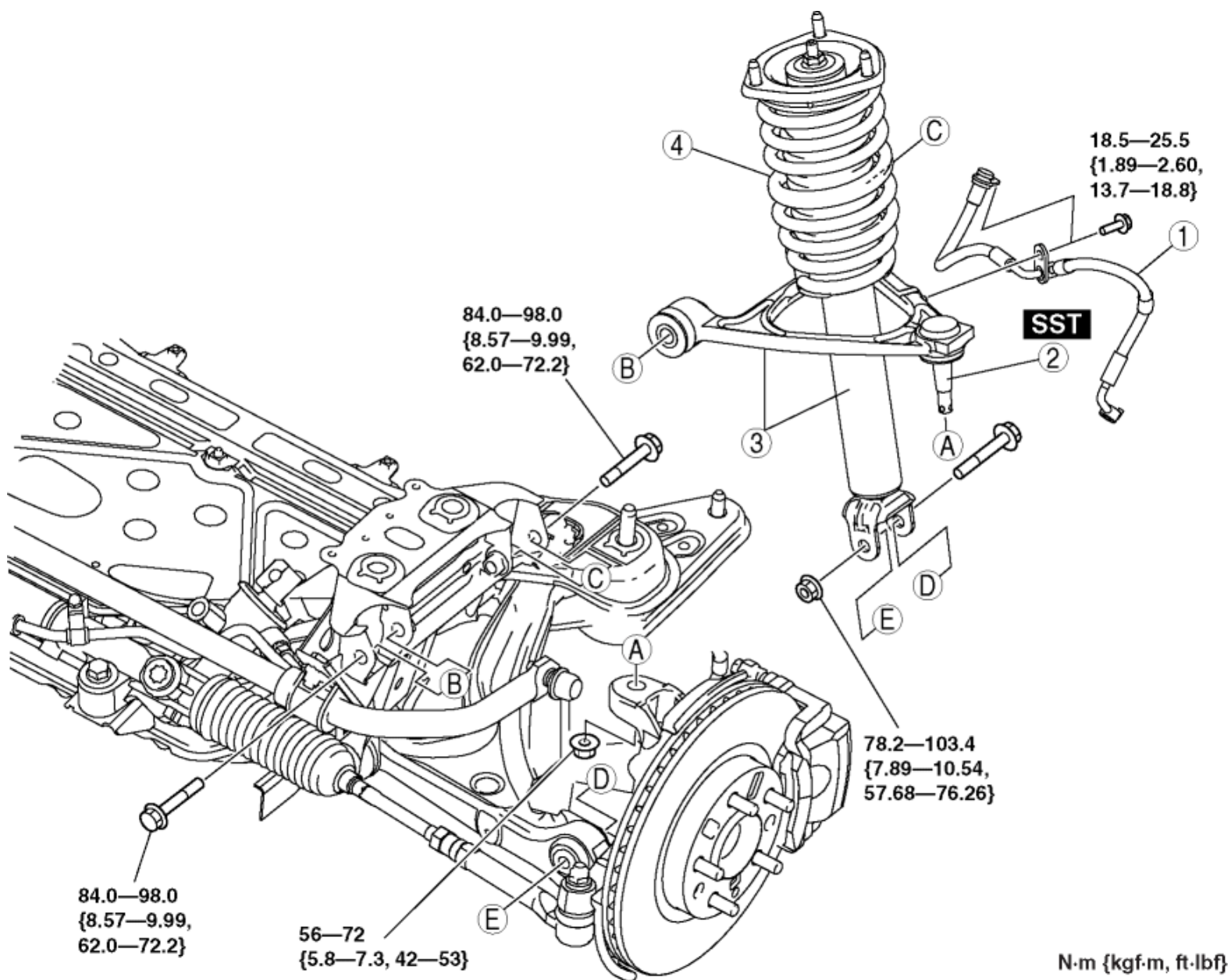
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## 2008 - MX-5 - Suspension

### FRONT SHOCK ABSORBER AND COIL SPRING REMOVAL/INSTALLATION

#### CAUTION:

- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the wiring harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled while servicing the vehicle.
1. Remove the front suspension tower bar. (See [FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION](#).)
  2. Remove in the order indicated in the table.
  3. Install in the reverse order of removal.
  4. Inspect the front wheel alignment, and adjust it if necessary. (See [FRONT WHEEL ALIGNMENT](#).)



1	Brake hose bracket
2	Front upper arm ball joint (See <a href="#">FRONT LOWER ARM REMOVAL/INSTALLATION.</a> )
3	Front shock absorber, coil spring and front upper arm
4	Front shock absorber and coil spring

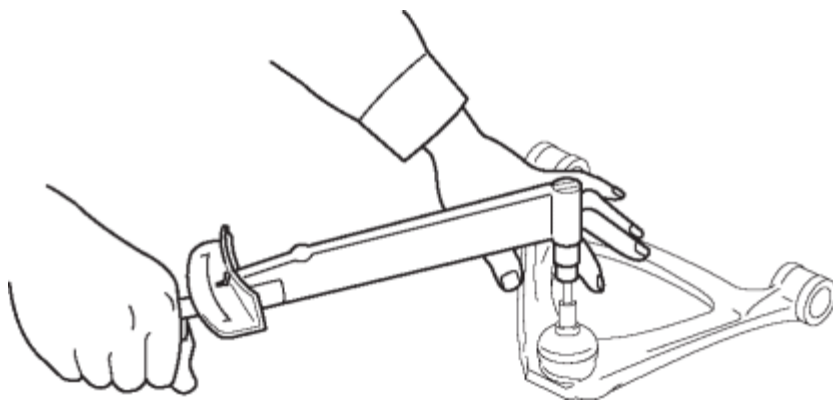
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## 2008 - MX-5 - Suspension

### FRONT UPPER ARM INSPECTION

1. Remove the front upper arm from the vehicle. (See [FRONT UPPER ARM REMOVAL/INSTALLATION](#).)
2. Inspect the front upper arm for bending or damage. If there is any malfunction, replace it.
3. Inspect the ball joint for excessive play, and if there is any malfunction, replace the front upper arm.
4. Rotate the ball joint **5 times**.
5. Measure the ball-joint rotational torque using an Allen wrench and a torque wrench.



#### Front upper arm ball joint rotational torque

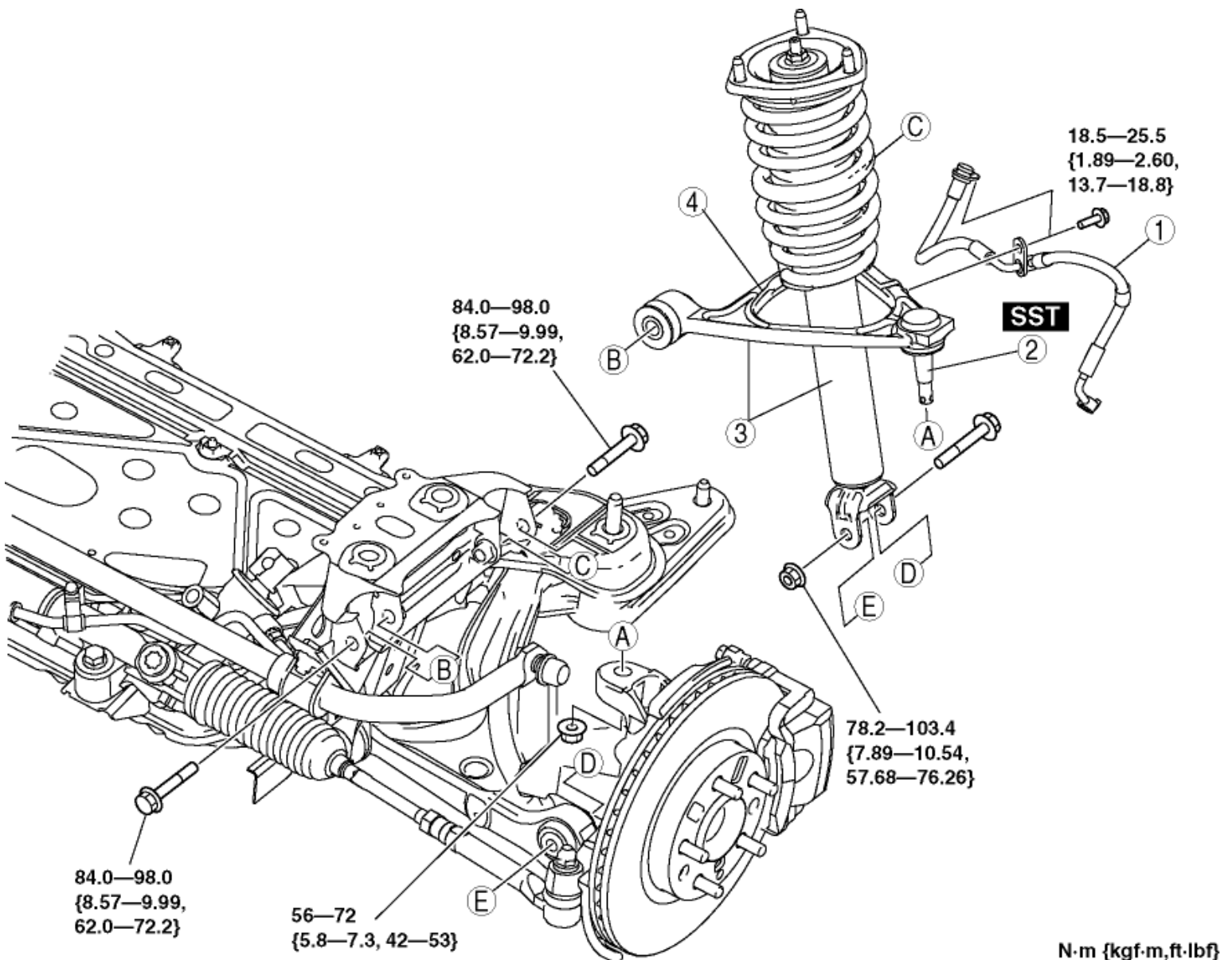
- 0.3—2.2 N·m {4—22 kgf·cm, 3—19 in·lbf}
- If not within the specification, replace the front upper arm. (See [FRONT UPPER ARM REMOVAL/INSTALLATION](#).)

## 2008 - MX-5 - Suspension

### FRONT UPPER ARM REMOVAL/INSTALLATION

#### CAUTION:

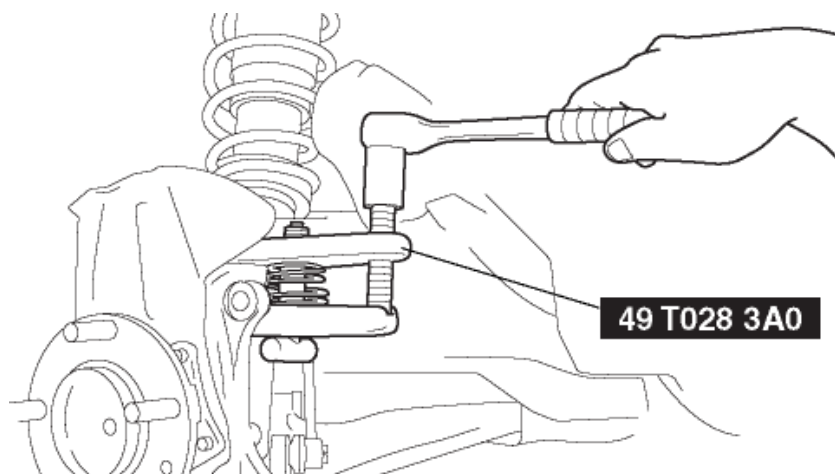
- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the wiring harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled while servicing the vehicle.
- Remove in the order indicated in the table.
  - Install in the reverse order of removal.
  - Inspect the front wheel alignment and adjust it if necessary. (See [FRONT WHEEL ALIGNMENT](#).)



1	Brake hose bracket
2	Front upper arm ball joint (See <a href="#">FRONT LOWER ARM REMOVAL/INSTALLATION.</a> )
3	Front shock absorber, coil spring and front upper arm (See <a href="#">Front Shock Absorber, Coil Spring And Front Upper Arm Removal Note.</a> )
4	Front upper arm (See <a href="#">Front Upper Arm Removal Note.</a> )

### Front Upper Arm Ball Joint Removal Note

1. Remove the front upper arm ball joint from the steering knuckle using the **SST**.



### Front Shock Absorber, Coil Spring And Front Upper Arm Removal Note

1. Loosen the shock absorber upper nuts.
2. Remove the front shock absorber lower bolt and nut.

### Front Upper Arm Removal Note

1. Remove the front upper arm bolts.
2. Push down the front lower arm, and then remove the front upper arm from the gap between the shock absorber lower end and the front lower arm.

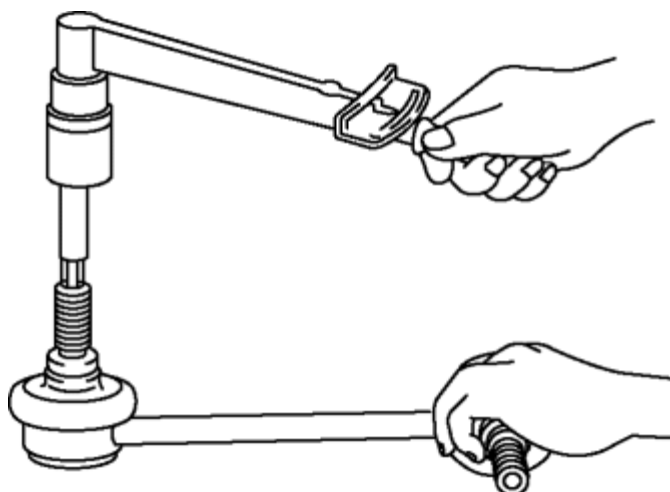
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## 2008 - MX-5 - Suspension

### FRONT STABILIZER CONTROL LINK INSPECTION

1. Remove the stabilizer control link from the vehicle. (See [FRONT STABILIZER REMOVAL/INSTALLATION](#).)
2. Inspect the stabilizer control link for bending or damage. If there is any malfunction, replace it.
3. Rotate the ball joint stud **10 times**, and then rock it side to side **10 times**.
4. Measure the ball-joint rotational torque using an Allen wrench and a torque wrench.



#### Stabilizer control link ball joint rotational torque

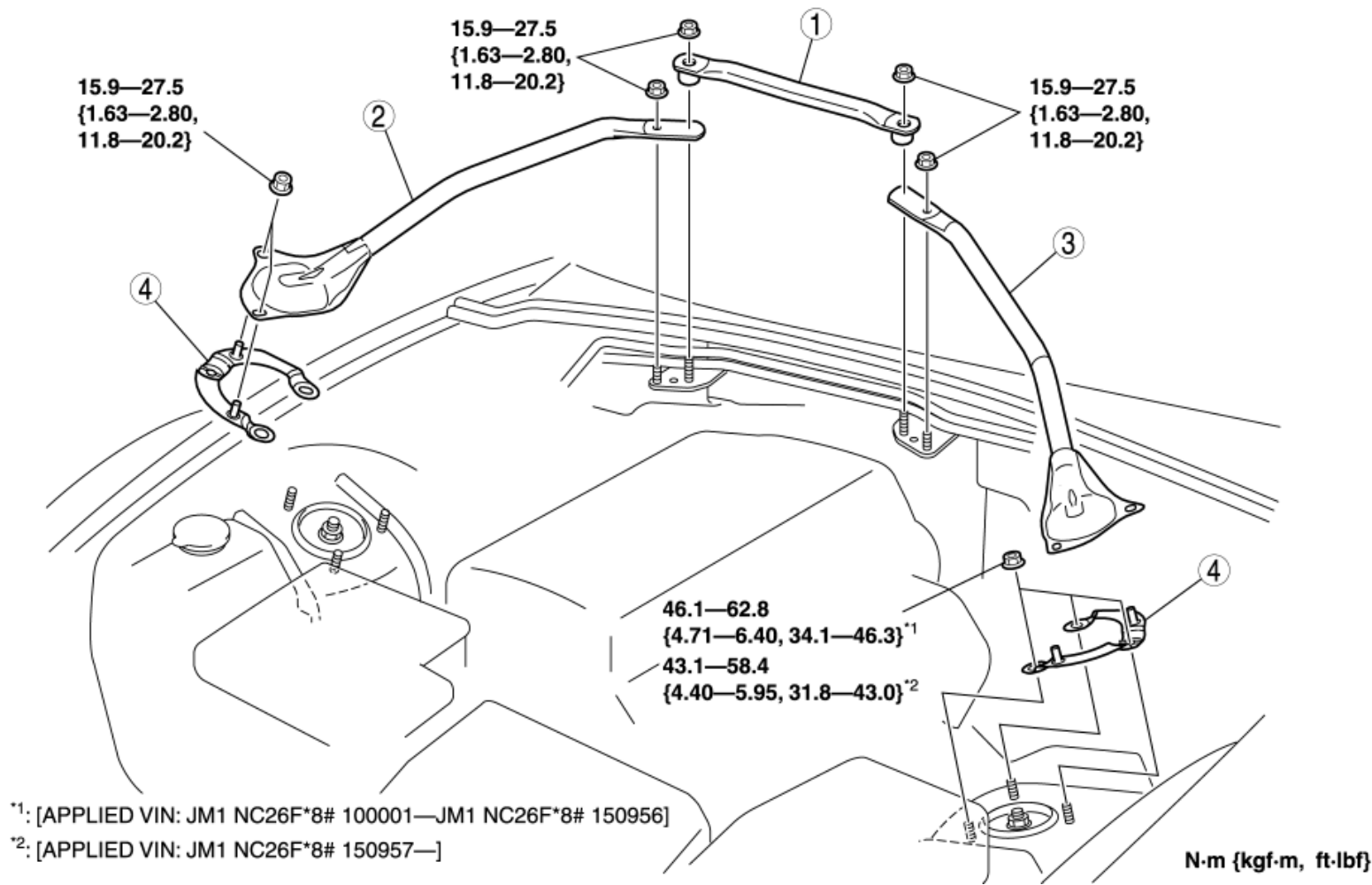
- 0.2—2.0 N·m {3—20 kgf·cm, 2—17 in·lbf}
- If not within the specification, replace the stabilizer control link. (See [FRONT STABILIZER REMOVAL/INSTALLATION](#).)



2008 - MX-5 - Suspension

FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION

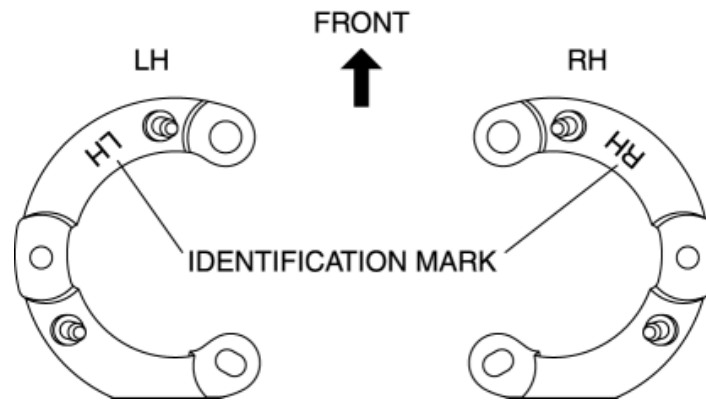
- 1. Remove in the order indicated in the table.
- 2. Install in the reverse order of removal.



1	Front suspension tower bar (joint)
2	Front suspension tower bar (right side)
3	Front suspension tower bar (left side)
4	Plate (See <a href="#">Plate Installation Note</a> .)

Plate Installation Note

1. Install the plates with the identification marks facing upward.



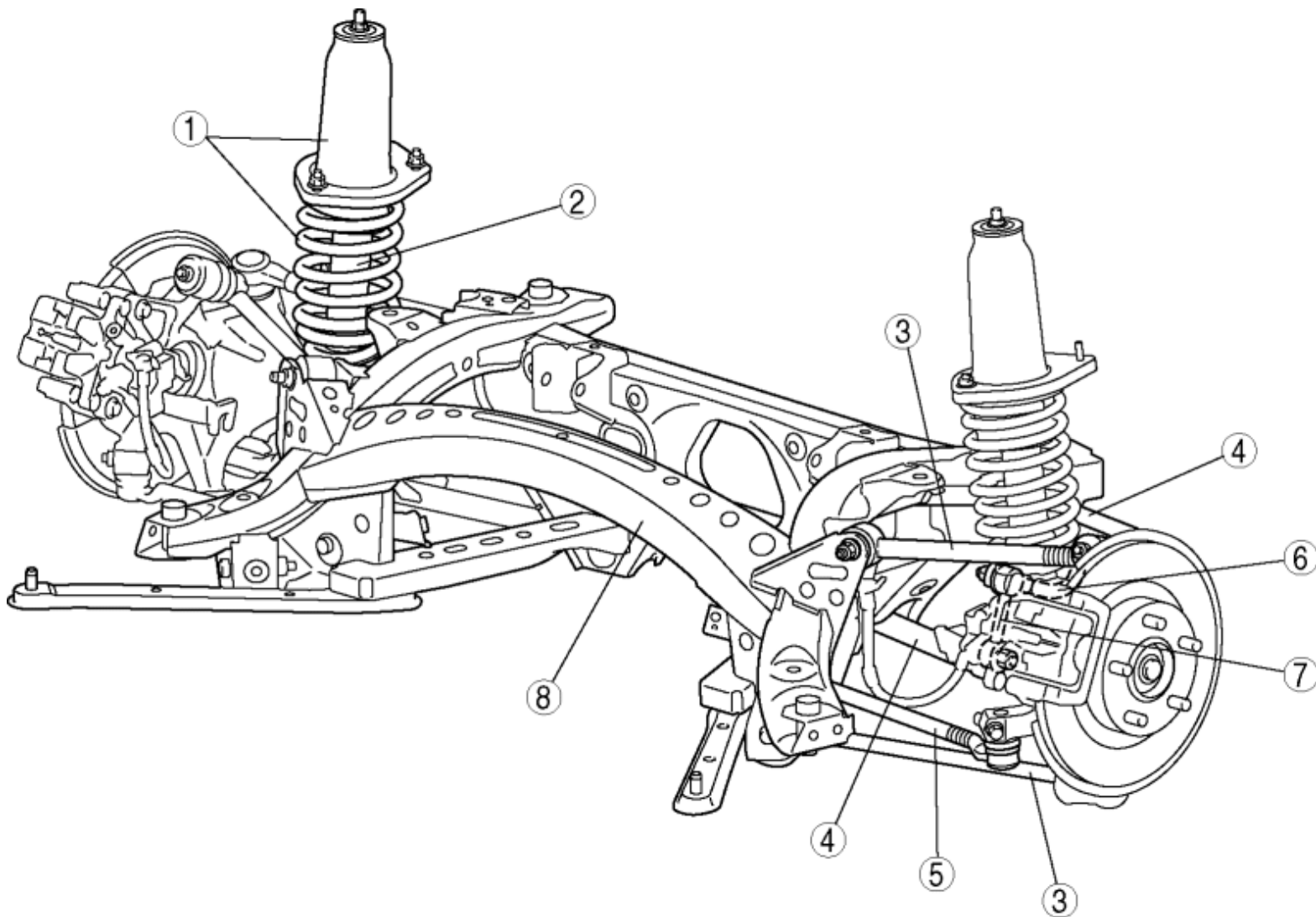
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## 2008 - MX-5 - Suspension

### REAR SUSPENSION LOCATION INDEX



1 Rear shock absorber and coil spring

(See [REAR SHOCK ABSORBER AND COIL SPRING REMOVAL/INSTALLATION.](#))

(See [REAR SHOCK ABSORBER AND COIL SPRING DISASSEMBLY/ASSEMBLY.](#))

2 Rear shock absorber

(See [REAR SHOCK ABSORBER INSPECTION.](#))

(See [REAR SHOCK ABSORBER DISPOSAL.](#))

3	<p>Rear trailing link</p> <p>(See <a href="#">REAR TRAILING LINK (UPPER) REMOVAL/INSTALLATION.</a>)</p> <p>(See <a href="#">REAR TRAILING LINK (UPPER) INSPECTION.</a>)</p> <p>(See <a href="#">REAR TRAILING LINK (LOWER) REMOVAL/INSTALLATION.</a>)</p>
4	<p>Rear lateral link</p> <p>(See <a href="#">REAR LATERAL LINK (UPPER) REMOVAL/INSTALLATION.</a>)</p> <p>(See <a href="#">REAR LATERAL LINK (UPPER) INSPECTION.</a>)</p> <p>(See <a href="#">REAR LATERAL LINK (LOWER) REMOVAL/INSTALLATION.</a>)</p> <p>(See <a href="#">REAR LATERAL LINK (LOWER) INSPECTION.</a>)</p>
5	<p>Toe control link</p> <p>(See <a href="#">TOE CONTROL LINK REMOVAL/INSTALLATION.</a>)</p> <p>(See <a href="#">TOE CONTROL LINK INSPECTION.</a>)</p>
6	<p>Rear stabilizer</p> <p>(See <a href="#">REAR STABILIZER REMOVAL/INSTALLATION.</a>)</p>
7	<p>Stabilizer control link</p> <p>(See <a href="#">REAR STABILIZER CONTROL LINK INSPECTION.</a>)</p>
8	<p>Rear crossmember</p> <p>(See <a href="#">REAR CROSSMEMBER REMOVAL/INSTALLATION.</a>)</p>

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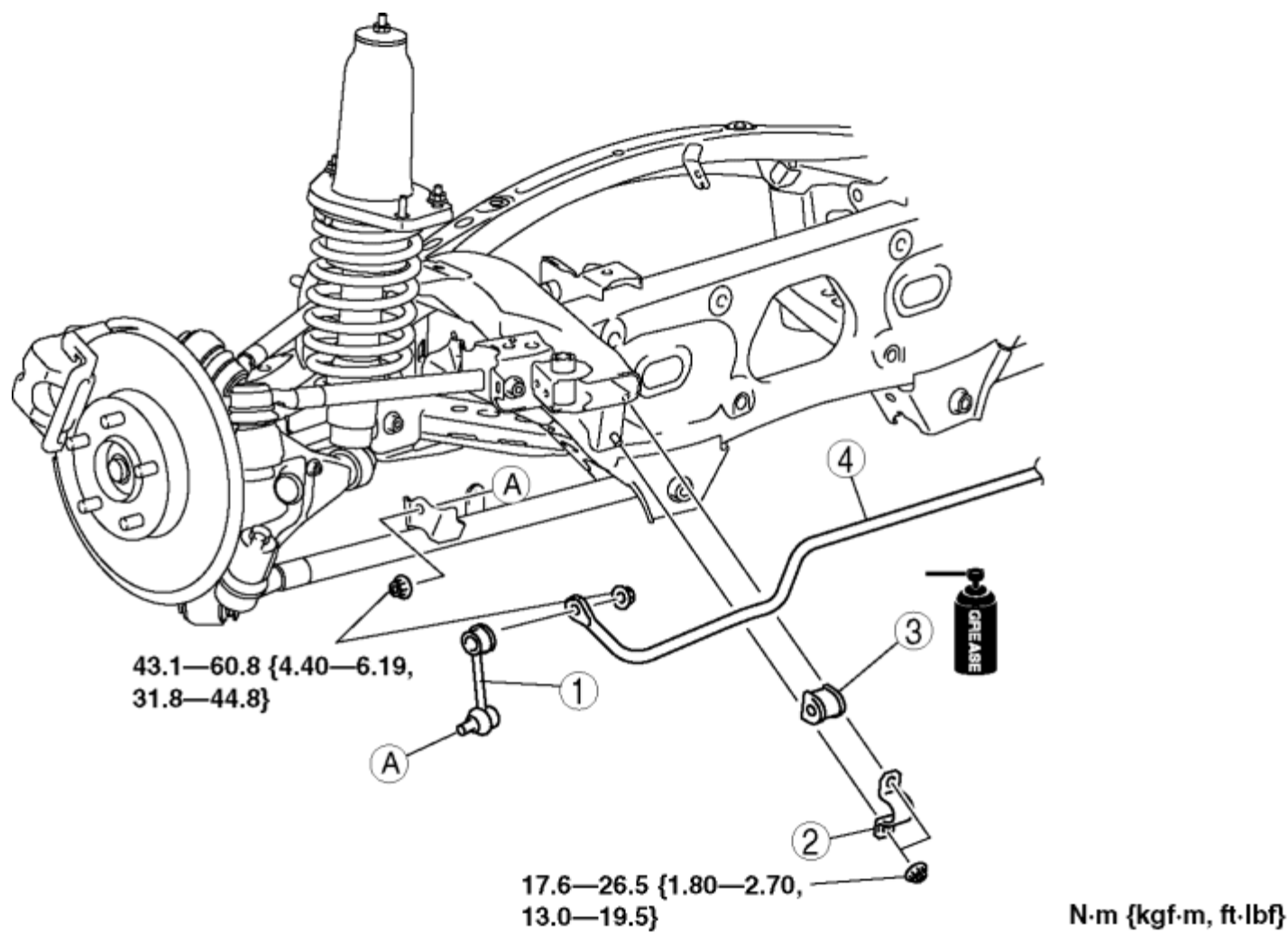
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2008 - MX-5 - Suspension

REAR STABILIZER REMOVAL/INSTALLATION

- 1. Remove in the order indicated in the table.
- 2. Install in the reverse order of removal.

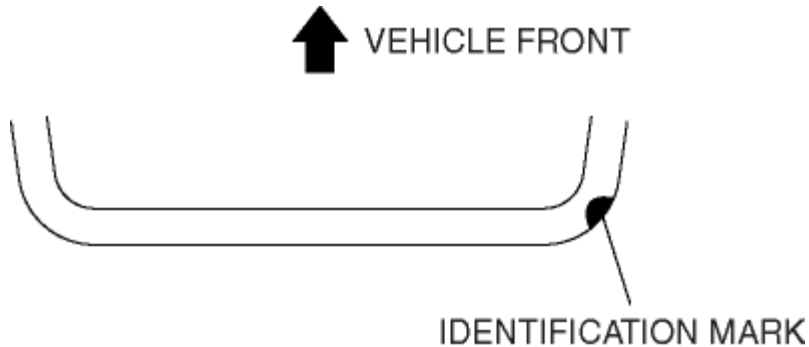


1	Stabilizer control link
	(See <a href="#">Stabilizer Control Link Installation Note.</a> )
2	Stabilizer bracket
3	Bushing

(See [Rear Stabilizer Installation Note.](#))

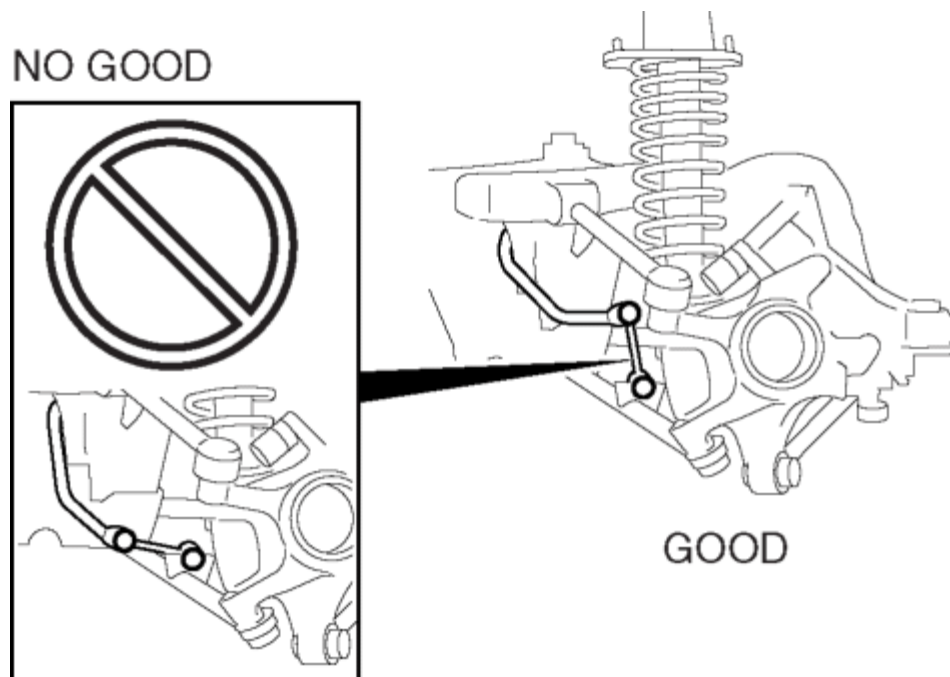
### Rear Stabilizer Installation Note

1. Install the rear stabilizer so that the identification mark is on the right side of the vehicle.



### Stabilizer Control Link Installation Note

1. Install the stabilizer control link in the proper angle as shown in the figure.

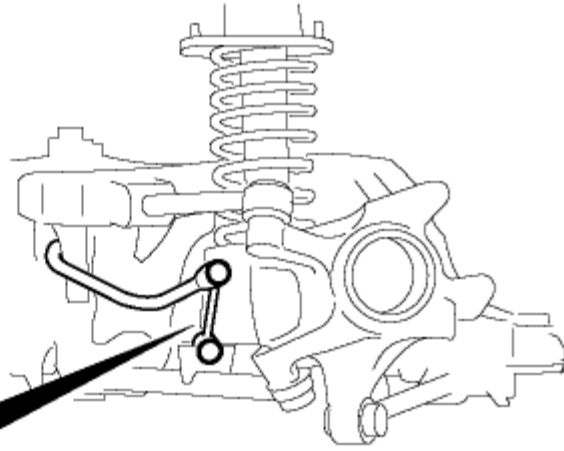
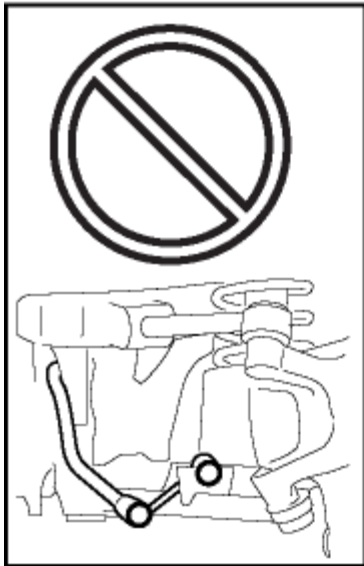


### CAUTION:

- Be sure to install the stabilizer control link in the proper position. If it is not installed properly, the stabilizer control link may interfere with peripheral components when driving, causing damage to each other.

2. Place the vehicle on the ground and verify that the stabilizer control link is installed in the angle shown in the figure.

NO GOOD



GOOD

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## 2008 - MX-5 - Suspension

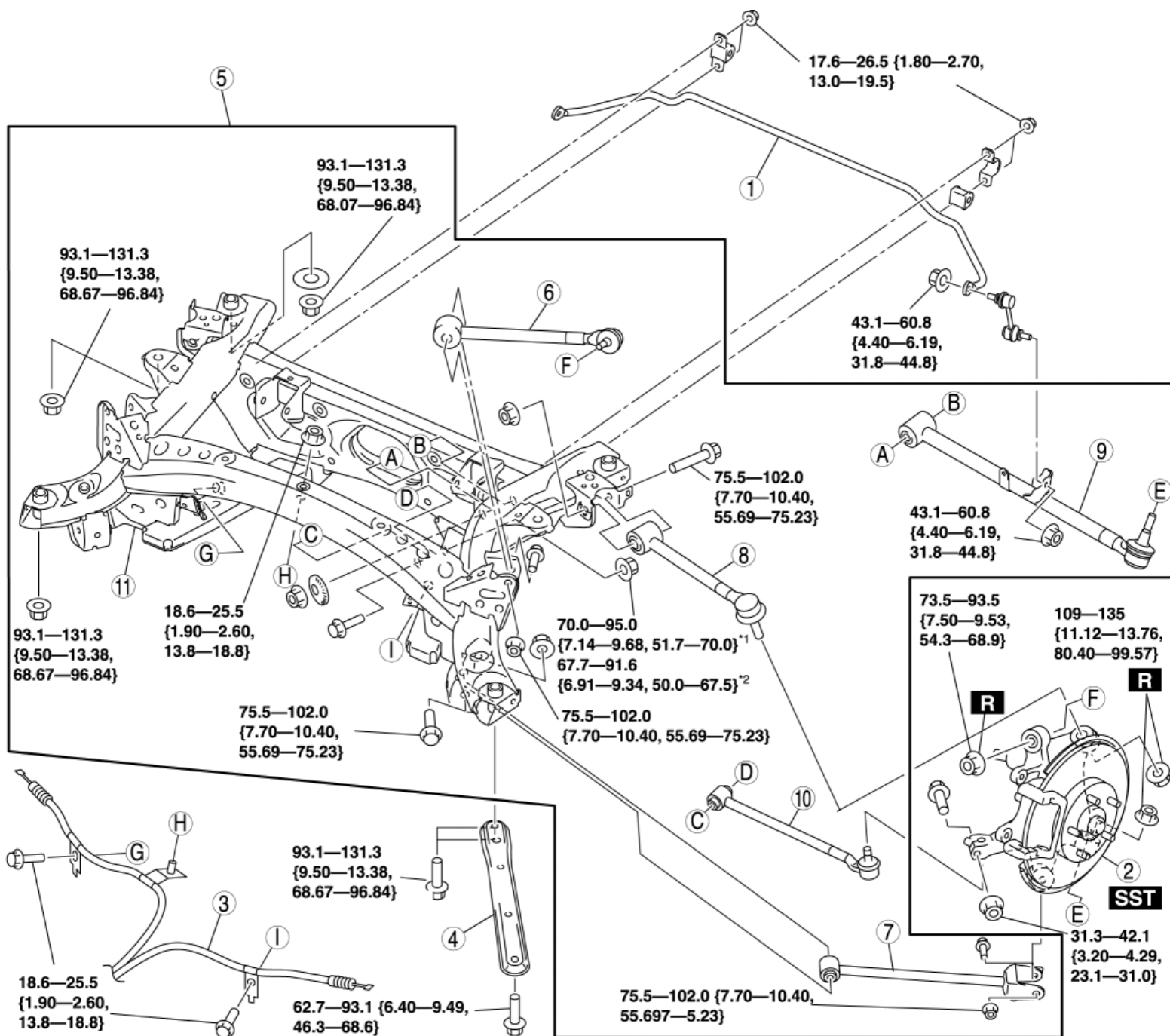
### REAR CROSSMEMBER REMOVAL/INSTALLATION

#### CAUTION:

- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the wiring harness if it is pulled by mistake. Before operations, remove the ABS wheel-speed sensor (axle side) and move the sensor away from the harnesses.

1. Remove the exhaust pipe. (See [EXHAUST SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
2. Remove the propeller shaft. (See [PROPELLER SHAFT REMOVAL/INSTALLATION](#).)
3. Remove the power plant frame. (See [TRANSMISSION REMOVAL/INSTALLATION \[M15M-D\]](#).) (See [TRANSMISSION REMOVAL/INSTALLATION \[P66M-D\]](#).) (See [AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION \[SJ6A-EL\]](#).)
4. Remove the rear drive shaft. (See [REAR DRIVE SHAFT REMOVAL/INSTALLATION](#).)
5. Remove the rear differential. (See [REAR DIFFERENTIAL REMOVAL/INSTALLATION](#).)
6. Remove in the order indicated in the table.
7. Install in the reverse order of removal.
8. Inspect the rear wheel alignment. (See [REAR WHEEL ALIGNMENT](#).)





<sup>1</sup>: [APPLIED VIN: JM1 NC26F\*8# 100001—JM1 NC26F\*8# 150956]

<sup>2</sup>: [APPLIED VIN: JM1 NC26F\*8# 150957—]

N-m {kgf-m, ft-lbf}

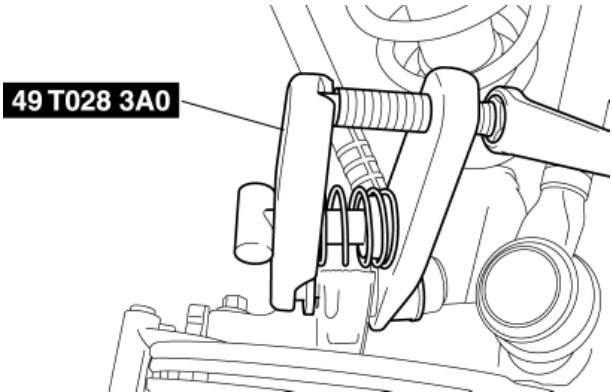
1	Rear stabilizer (See <a href="#">REAR STABILIZER REMOVAL/INSTALLATION.</a> )
2	Rear axle component (See <a href="#">Rear Axle Component Removal Note.</a> )
3	Parking brake cable
4	Stopper plate
5	Rear crossmember component

	(See <a href="#">Rear Crossmember Component Removal Note</a> .)
6	Rear trailing link (upper)
7	Rear trailing link (lower)
8	Rear lateral link (upper)
9	Rear lateral link (lower)
10	Toe control link
11	Rear crossmember

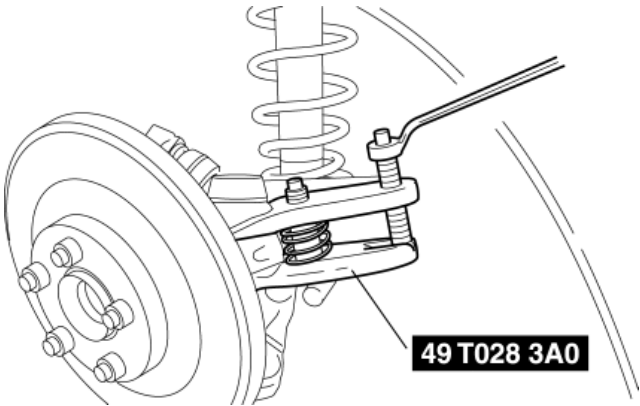
Rear Axle Component Removal Note

NOTE:

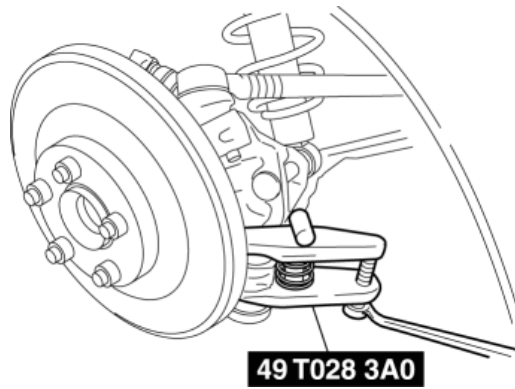
- When removing the ball joints, the rear knuckle bushings may also come off. If they come off, replace the rear knuckle.
- Support the knuckle using a jack.
  - Using the **SST**, disconnect the rear trailing link (upper) ball joint.



- Remove the rear trailing link (lower) outer bolt.
- Using the **SST**, disconnect the rear lateral link (upper) ball joint.



- Using the **SST**, disconnect the rear lateral link (lower) ball joint.

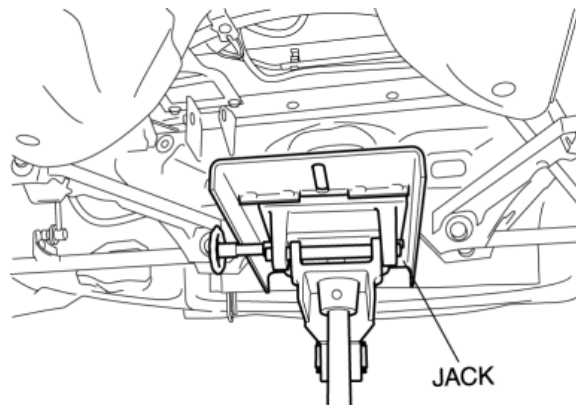


6. Remove the toe control link outer bolt.
7. Remove the shock absorber lower bolt.
8. Remove the rear axle component.

#### Rear Crossmember Component Removal Note

##### **WARNING:**

1. Be sure that the crossmember component is securely supported by the jack. If not securely supported, the crossmember component could fall, resulting in serious injury or death, and damage to the vehicle.
1. Support the rear crossmember with the jack, and remove the bolt.



2. Remove the rear crossmember component.

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## 2008 - MX-5 - Suspension

### REAR SHOCK ABSORBER INSPECTION

1. Inspect the rear shock absorber in the same way as the front shock absorber.

(See [FRONT SHOCK ABSORBER INSPECTION](#).)

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## 2008 - MX-5 - Suspension

### REAR SHOCK ABSORBER DISPOSAL

1. Dispose of the rear shock absorber in the same way as the front shock absorber.

(See [FRONT SHOCK ABSORBER DISPOSAL](#).)

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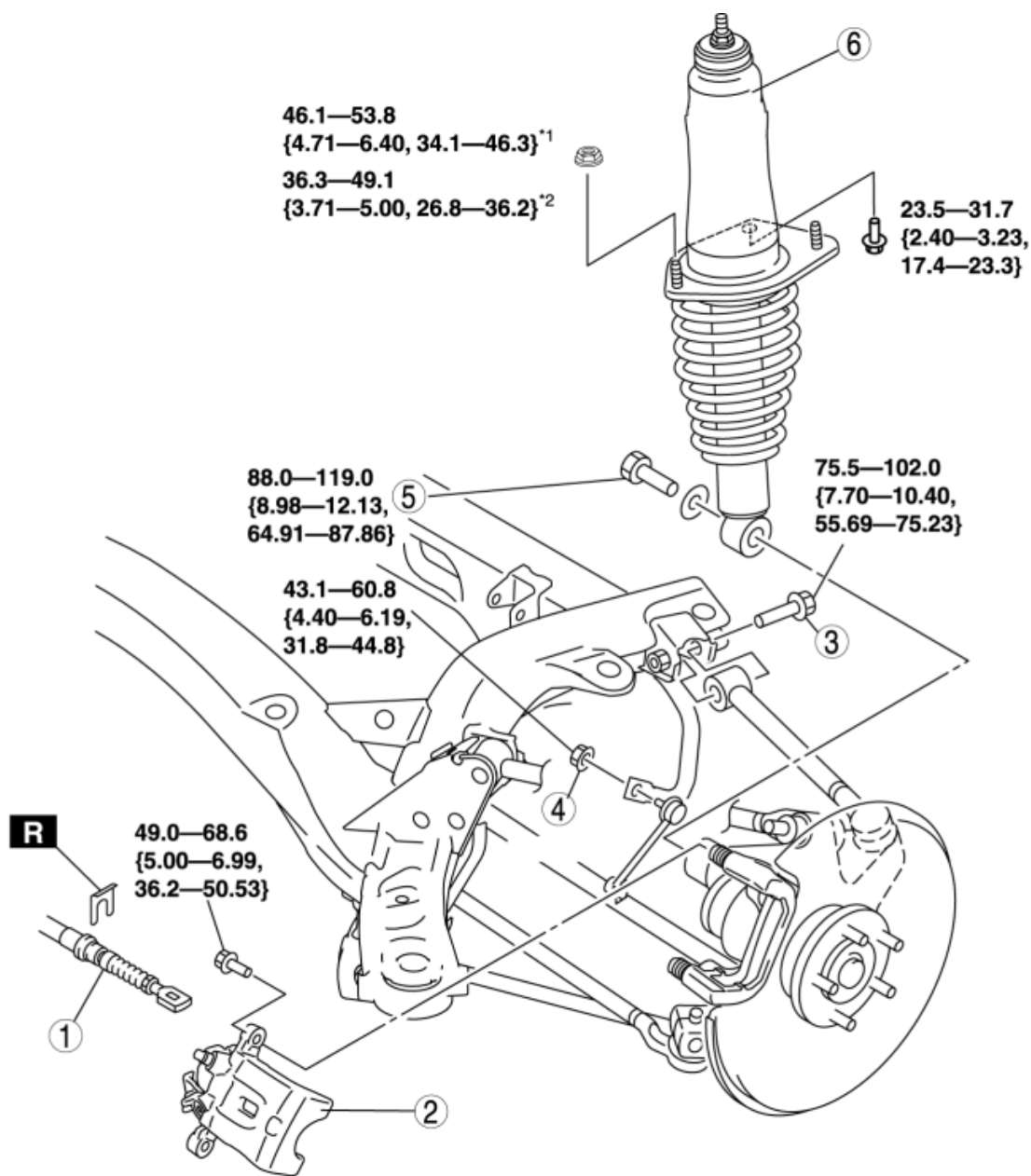
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## 2008 - MX-5 - Suspension

### REAR SHOCK ABSORBER AND COIL SPRING REMOVAL/INSTALLATION

#### CAUTION:

- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the wiring harness if it is pulled by mistake. Before operations, remove the ABS wheel-speed sensor (axle side), and move the sensor away from the harnesses.
1. When working on the left side, remove the fuel tank protector. (See [FUEL TANK REMOVAL/INSTALLATION \[LF\]](#).)
  2. Remove in the order indicated in the table.
  3. Install in the reverse order of removal.



<sup>\*1</sup>: [APPLIED VIN: JM1 NC26F\*8# 100001—JM1 NC26F\*8# 150956]

<sup>\*2</sup>: [APPLIED VIN: JM1 NC26F\*8# 150957—]

N·m {kgf·m, ft·lbf}

1	Parking brake cable
2	Caliper (See <a href="#">Caliper Removal Note.</a> )
3	Rear lateral link (upper) bolt
4	Stabilizer control link upper nut
5	Rear shock absorber lower bolt
6	Rear shock absorber and coil spring

## Caliper Removal Note

1. Remove the caliper, and hang the cable out of the way.

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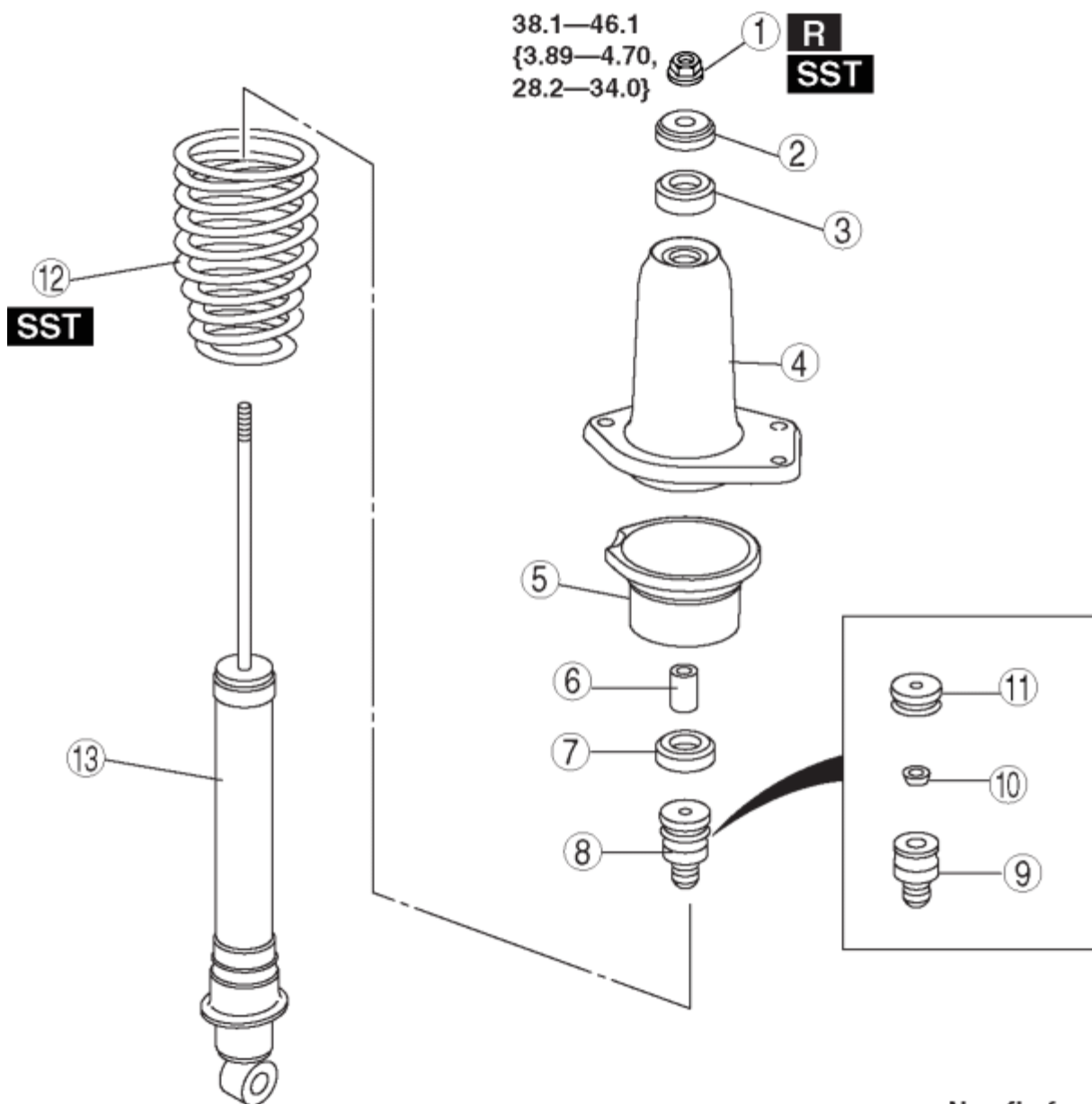


## 2008 - MX-5 - Suspension

### REAR SHOCK ABSORBER AND COIL SPRING DISASSEMBLY/ASSEMBLY

#### WARNING:

- Removing/installing the shock absorber and coil spring is dangerous. The shock absorber and coil spring could fly off and cause injury or death, and damage the vehicle.
1. Remove the rear shock absorber and coil spring. (See [REAR SHOCK ABSORBER AND COIL SPRING REMOVAL/INSTALLATION](#).)
  2. Remove in the order indicated in the table.
  3. Install in the reverse order of removal.



1	Piston rod nut (See <a href="#">Piston Rod Nut Removal Note.</a> )
2	Retainer
3	Bushing
4	Upper spring seat (See <a href="#">Upper Spring Seat Installation Note.</a> )
5	Spring seat rubber (See <a href="#">Spring Seat Rubber Installation Note.</a> )

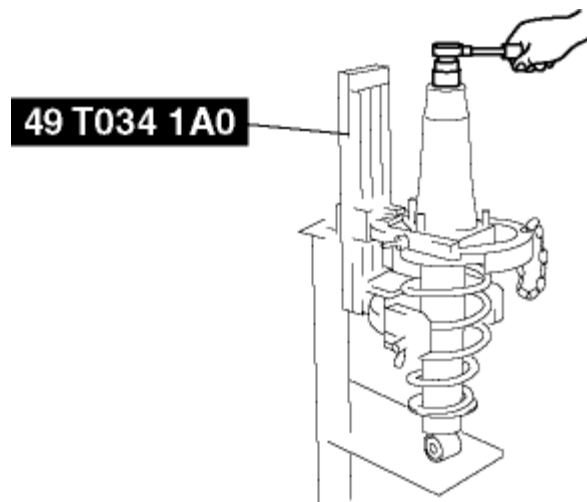
6	Spacer
7	Bushing
8	Bound stopper and stopper casing
9	Bound stopper
10	Collar (See <a href="#">Collar Installation Note.</a> )
11	Stopper casing
12	Coil spring (See <a href="#">Coil Spring Installation Note.</a> )
13	Rear shock absorber

## Piston Rod Nut Removal Note

### WARNING:

- Before removing the piston rod nut, secure the shock absorber and spring in the SSTs. Otherwise, the shock absorber and spring could fly off under tremendous pressure and cause serious injury or death, or damage to the vehicle.

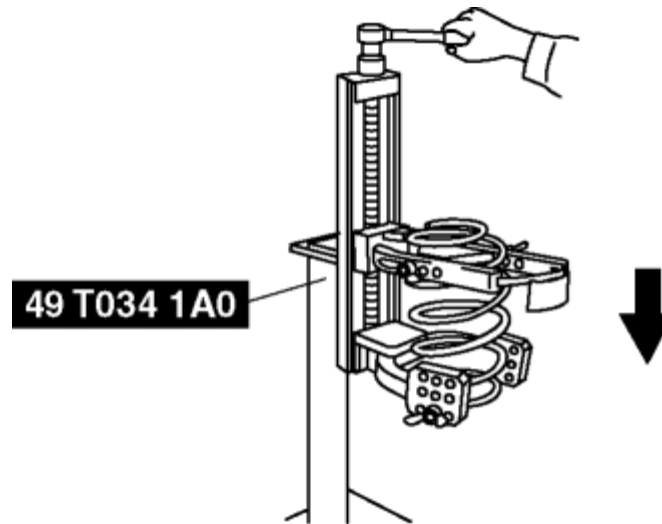
1. Set the **SSTs** using cloth to prevent the spring from being damaged.



2. Using the **SSTs**, compress the coil spring and remove the piston rod nut.

## Coil Spring Installation Note

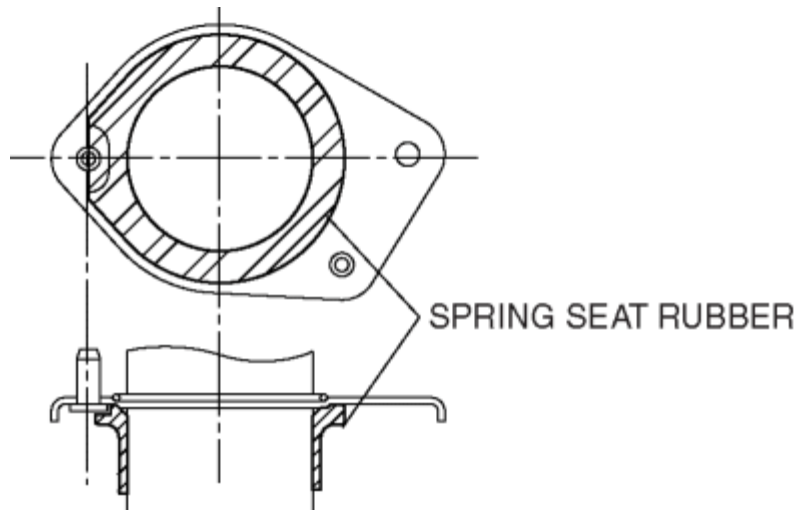
1. Set the coil spring to the **SSTs** using cloth.
2. Using the **SSTs**, compress the coil spring.



3. Install the shock absorber so that the lower end of the coil spring is seated on the step of the lower spring seat.

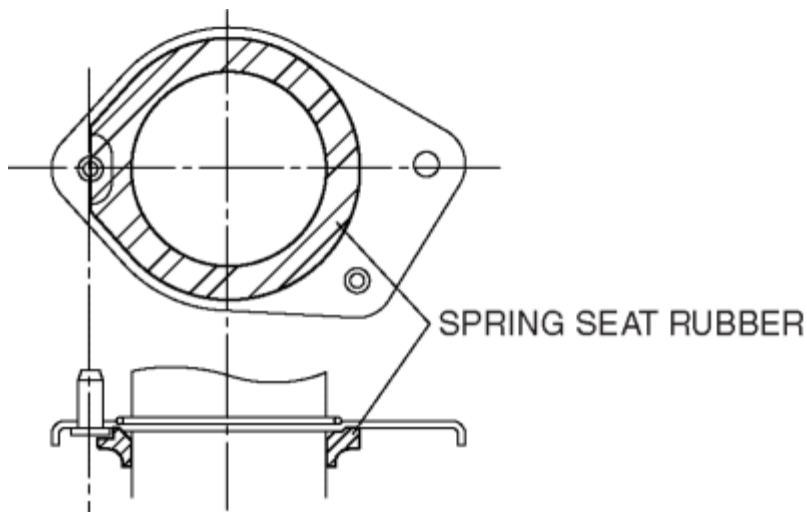
## Collar Installation Note

1. Install the collar so that the tapered side is facing downward as shown in the figure.



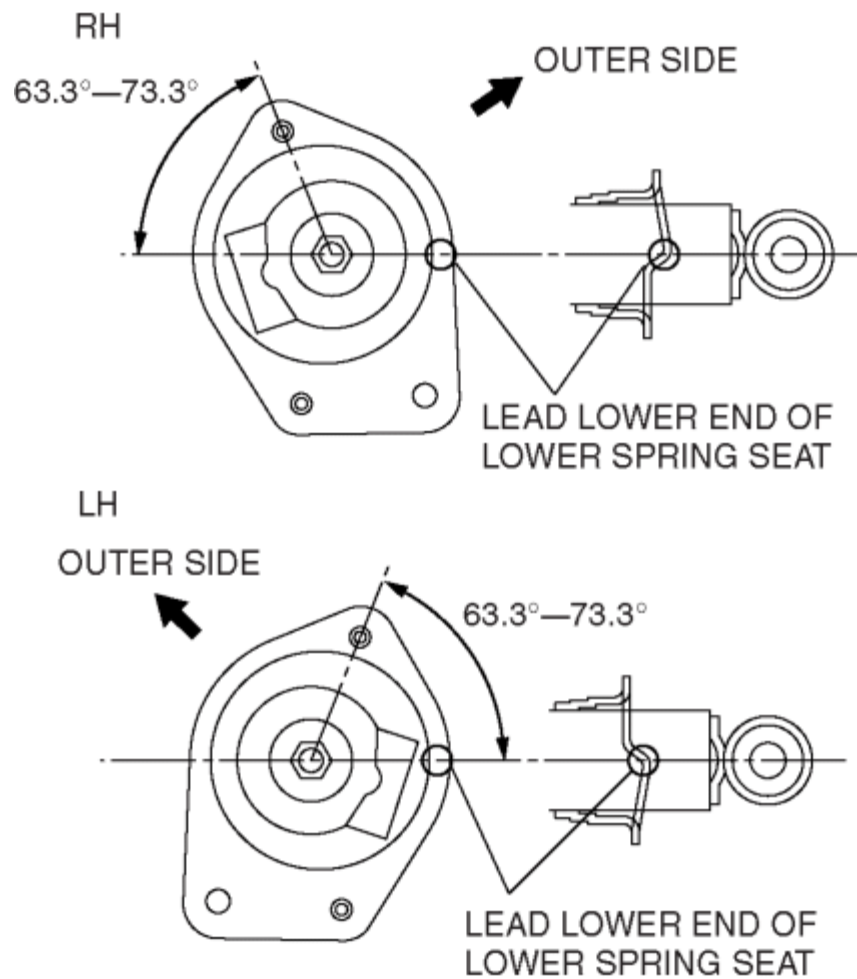
## Spring Seat Rubber Installation Note

1. Install the spring seat rubber to the upper spring seat as shown in the figure.



### Upper Spring Seat Installation Note

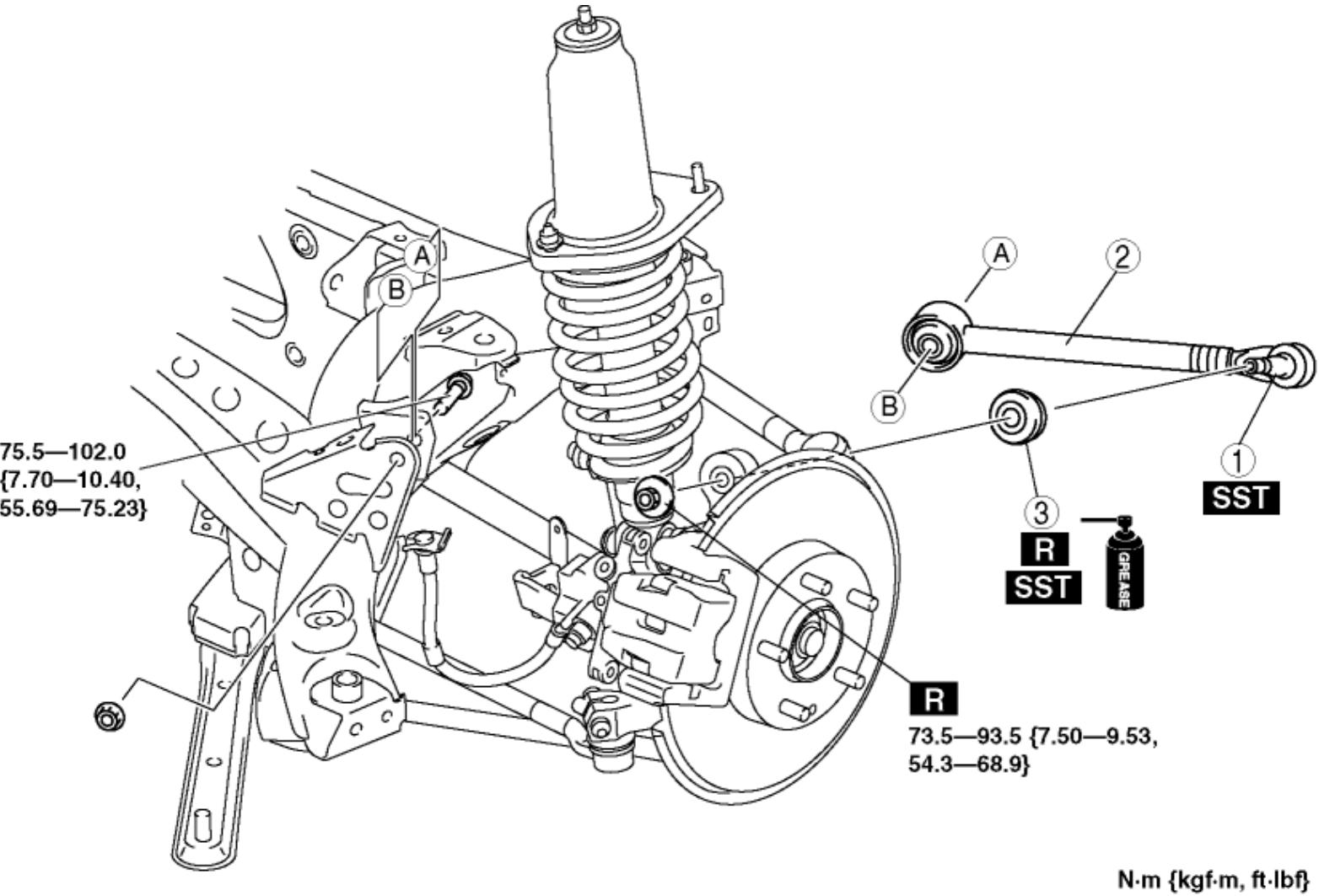
1. Install the coil spring with the lead lower end of the lower spring seat facing the direction shown in the figure.



2008 - MX-5 - Suspension

REAR TRAILING LINK (UPPER) REMOVAL/INSTALLATION

- 1. Remove in the order indicated in the table.
- 2. Install in the reverse order of removal.
- 3. Inspect the rear wheel alignment. (See [REAR WHEEL ALIGNMENT.](#))

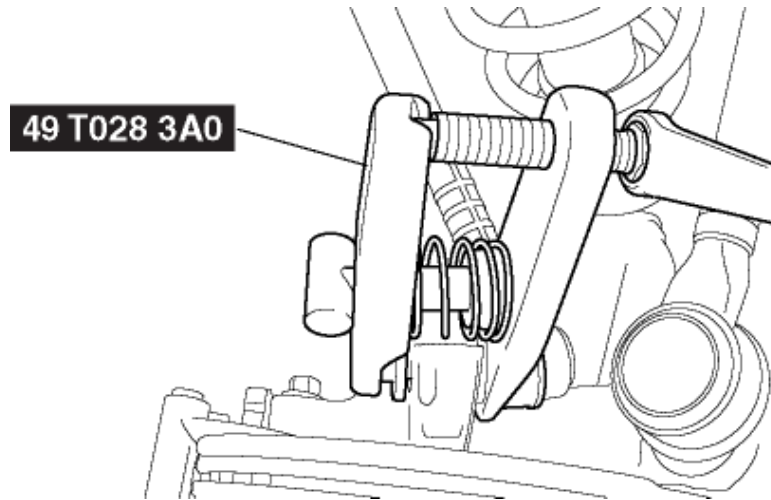


1	Rear trailing link (upper) ball joint (See <a href="#">Rear Trailing Link (Upper) Ball Joint Removal Note.</a> )
2	Rear trailing link (upper)
3	Dust boot

(See [Dust Boot Installation Note](#).)

### Rear Trailing Link (Upper) Ball Joint Removal Note

1. Using the **SST**, disconnect the ball joint.

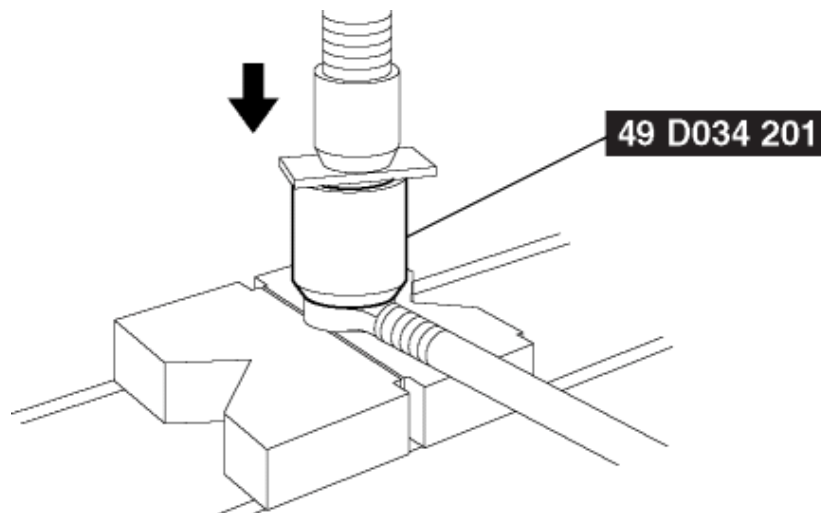


#### NOTE:

- When removing the rear trailing link (upper) ball joint, the rear knuckle bushing may also come off. If it comes off, replace the rear knuckle.

### Dust Boot Installation Note

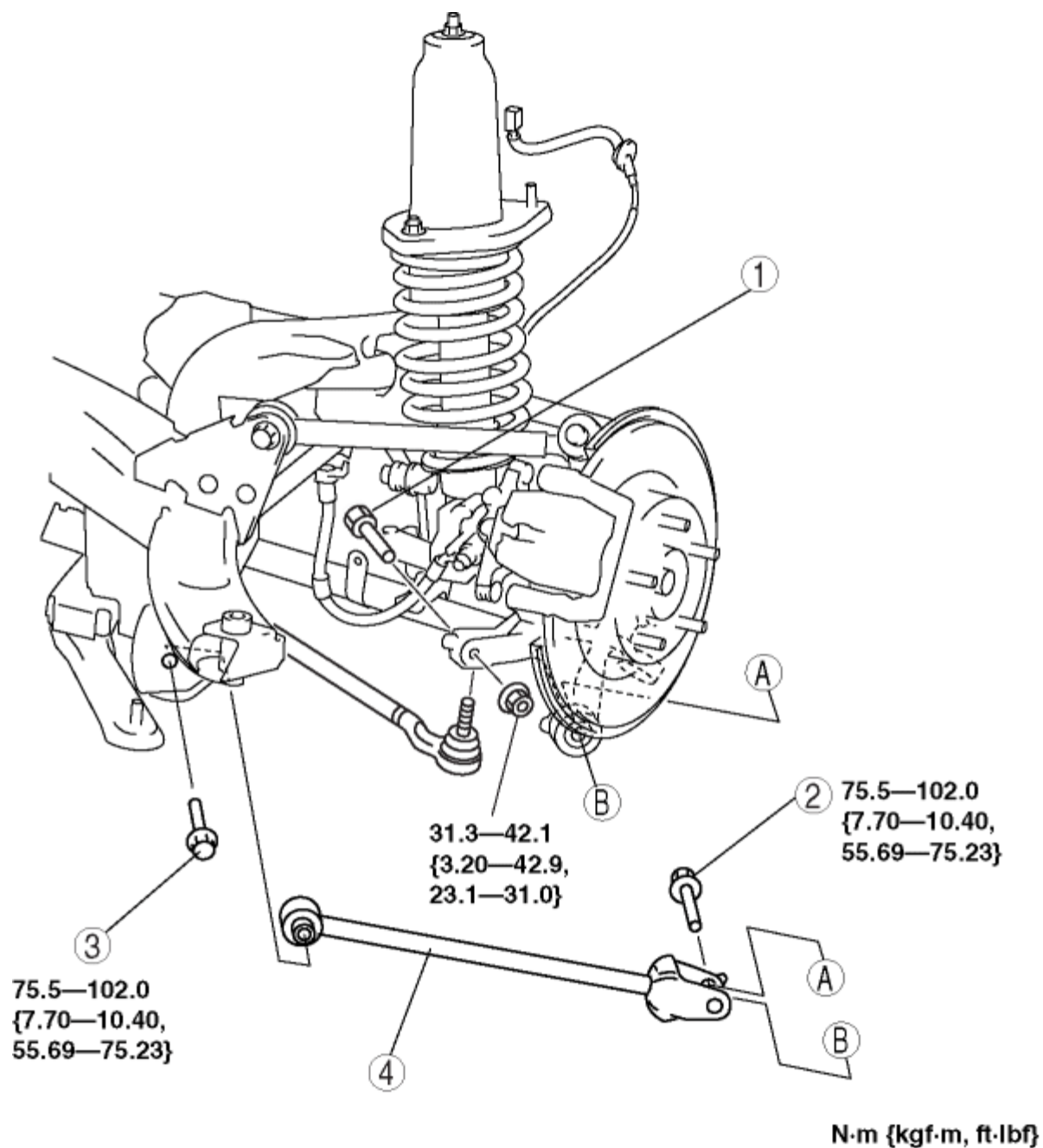
1. Wipe the grease off the ball joint stud.
2. Fill the inside of the new dust boot with grease.
3. Using the **SST**, install the dust boot to the ball joint.



4. Wipe off the excess grease.







1	Toe control link outer bolt
2	Rear trailing link (lower) outer bolt
3	Rear trailing link (lower) inner bolt
4	Rear trailing link (lower)

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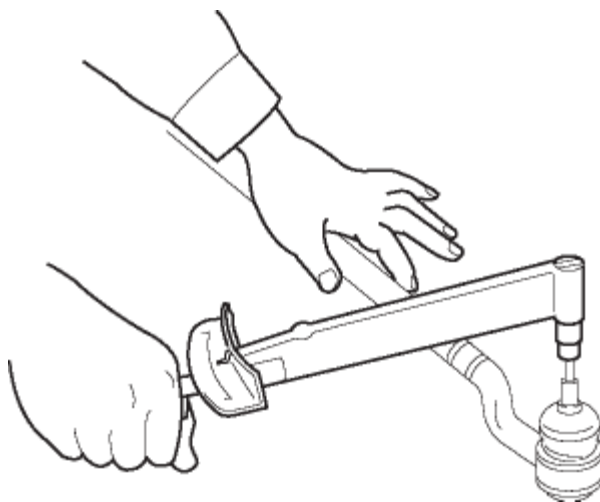
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## 2008 - MX-5 - Suspension

### REAR TRAILING LINK (UPPER) INSPECTION

1. Remove the rear trailing link (upper) from the vehicle. (See [REAR TRAILING LINK \(UPPER\) REMOVAL/INSTALLATION.](#))
2. Inspect the link for bending or damage. If there is any malfunction, replace the rear trailing link (upper).
3. Inspect the ball joint for looseness. If there is any malfunction, replace the ball joint.
4. Rotate the ball joint **5 times**.
5. Measure the ball-joint rotational torque using an Allen wrench and a torque wrench.



#### Rear trailing link (upper) ball joint rotational torque

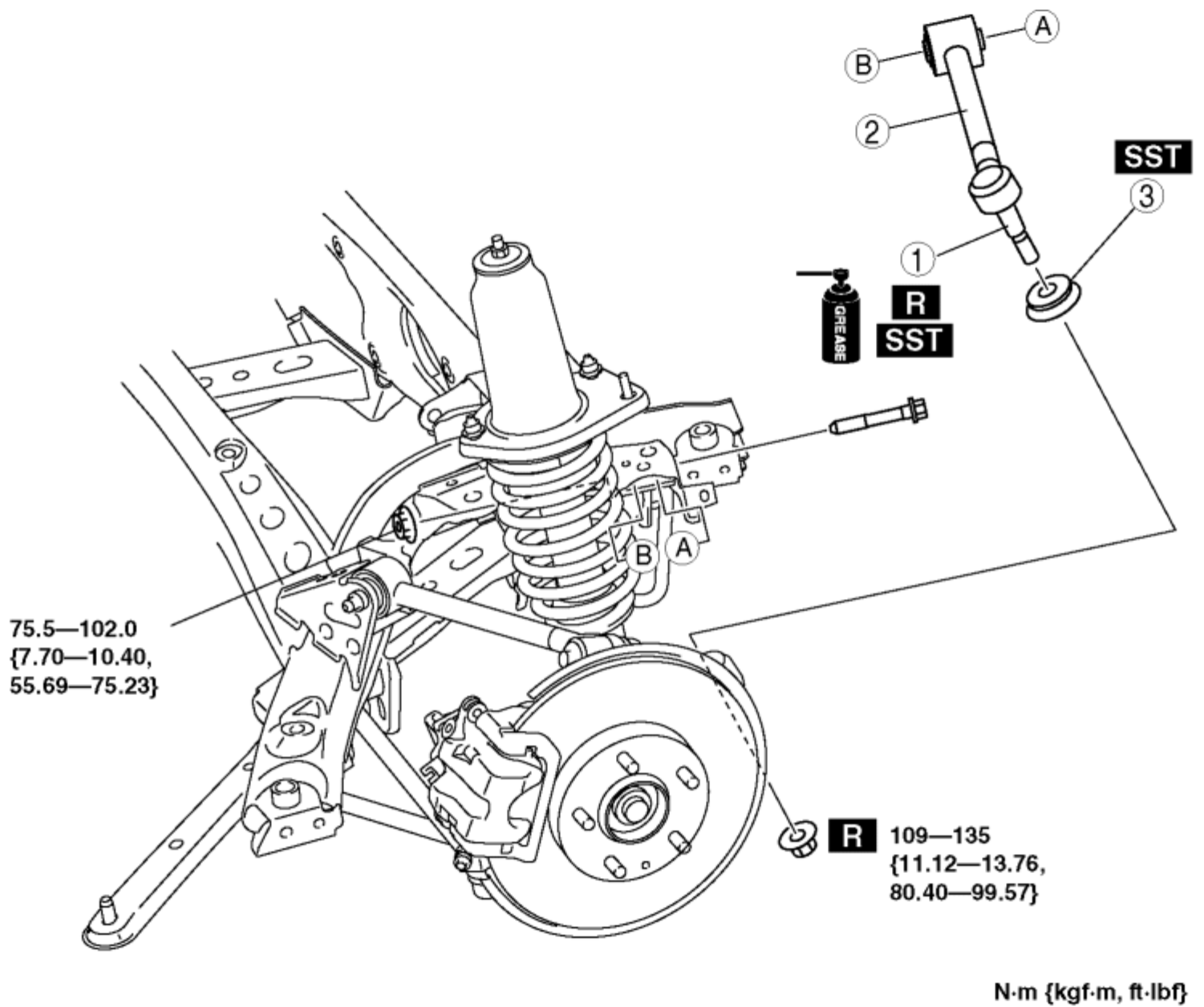
- 0.4—3.3 N·m {5—33 kgf·cm, 4—29 in·lbf}
- If not within the specification, replace the rear trailing link (upper). (See [REAR TRAILING LINK \(UPPER\) REMOVAL/INSTALLATION.](#))

## 2008 - MX-5 - Suspension

### REAR LATERAL LINK (UPPER) REMOVAL/INSTALLATION

#### CAUTION:

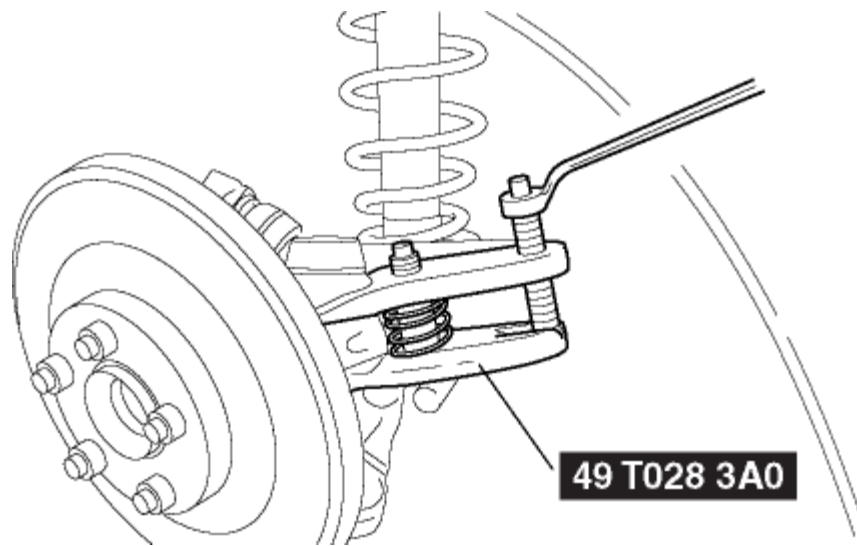
- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the wiring harness if it is pulled by mistake. Before operations, remove the ABS wheel-speed sensor (axle side) and move the sensor away from the harnesses.
1. Remove in the order indicated in the table.
  2. Install in the reverse order of removal.
  3. Inspect the rear wheel alignment. (See [REAR WHEEL ALIGNMENT](#).)



1	Rear lateral link (upper) ball joint (See <a href="#">Rear Lateral Link (Upper) Ball Joint Removal Note.</a> )
2	Rear lateral link (upper)
3	Dust boot (See <a href="#">Dust Boot Installation Note.</a> )

### Rear Lateral Link (Upper) Ball Joint Removal Note

1. Using the **SST**, disconnect the rear lateral link (upper) ball joint.

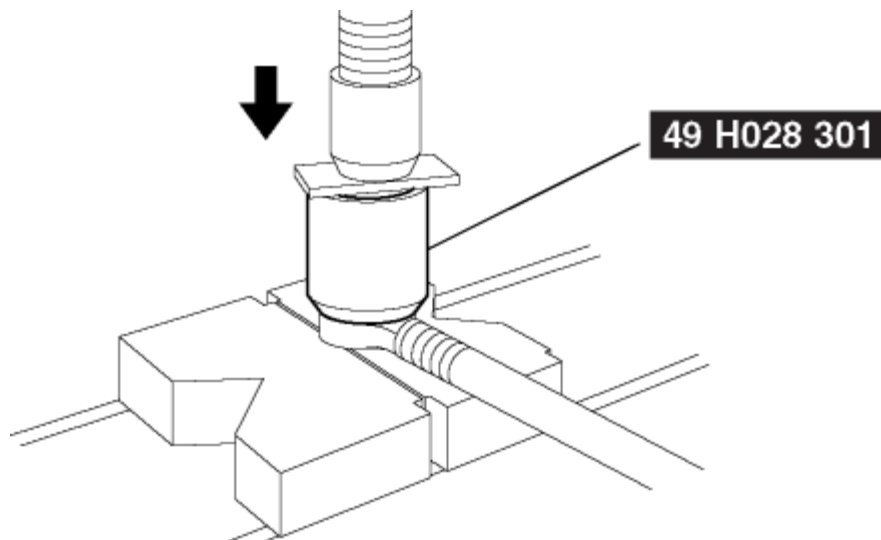


**NOTE:**

- When removing the rear lateral link (upper) ball joint, the rear knuckle bushing may also come off. If it comes off, replace the rear knuckle.

**Dust Boot Installation Note**

1. Wipe the grease off the ball joint stud.
2. Fill the inside of the new dust boot with grease.
3. Using the **SST**, install the dust boot to the ball joint.

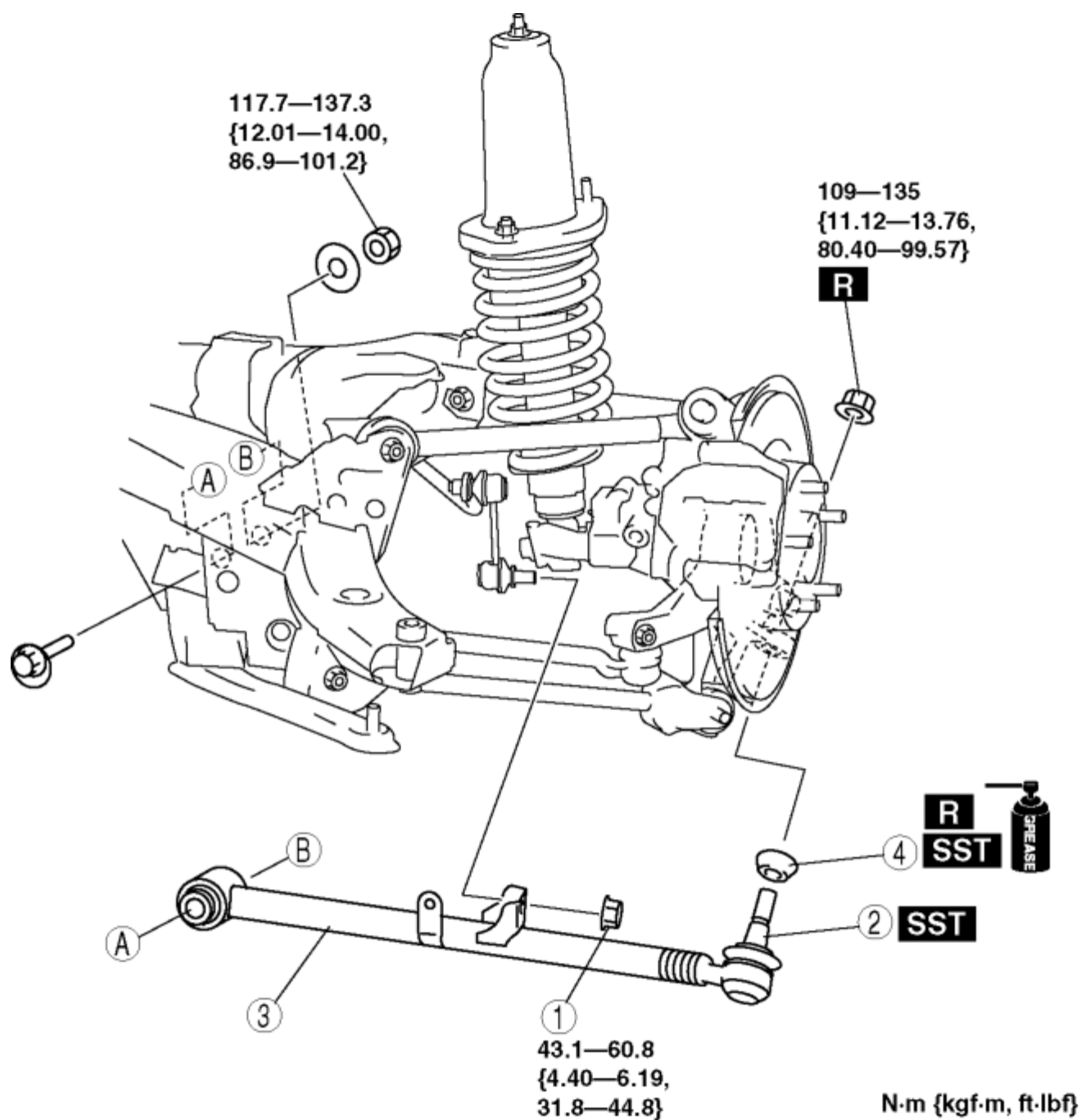


4. Wipe off the excess grease.

## 2008 - MX-5 - Suspension

### REAR LATERAL LINK (LOWER) REMOVAL/INSTALLATION

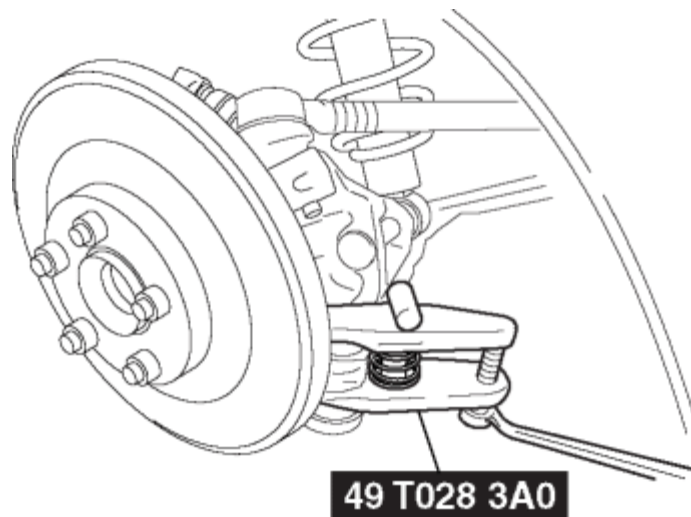
1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. Inspect the rear wheel alignment. (See [REAR WHEEL ALIGNMENT](#).)



1	Stabilizer control link lower nut
2	Rear lateral link (lower) ball joint (See <a href="#">Rear Lateral Link (Lower) Ball Joint Removal Note.</a> )
3	Rear lateral link (lower)
4	Dust boot (See <a href="#">Dust Boot Installation Note.</a> )

### Rear Lateral Link (Lower) Ball Joint Removal Note

1. Using the **SST**, disconnect the ball joint.



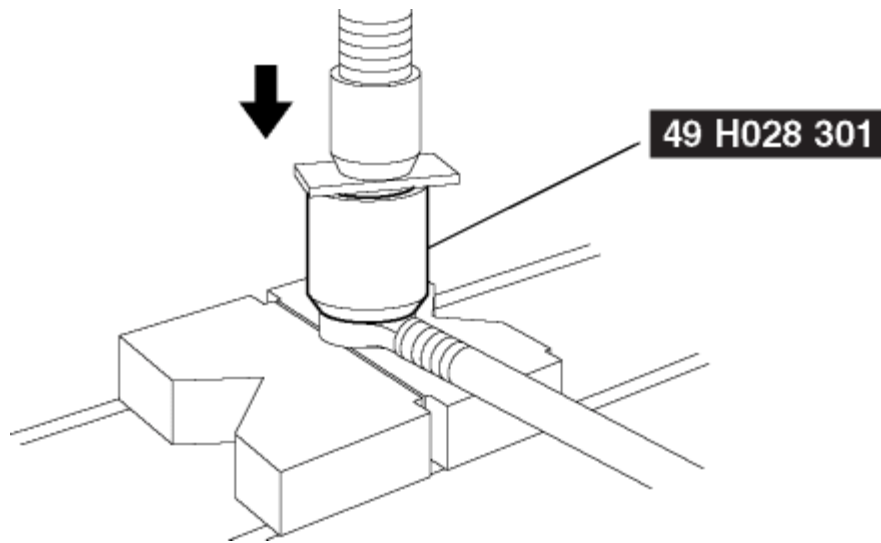
#### NOTE:

- When removing the rear lateral link (lower) ball joint, the rear knuckle bushing may also come off. If it comes off, replace the rear knuckle.

### Dust Boot Installation Note

1. Wipe the grease off the ball joint stud.
2. Fill the inside of the new dust boot with grease.
3. Using the **SST**, install the dust boot to the ball joint.





4. Wipe off the excess grease.

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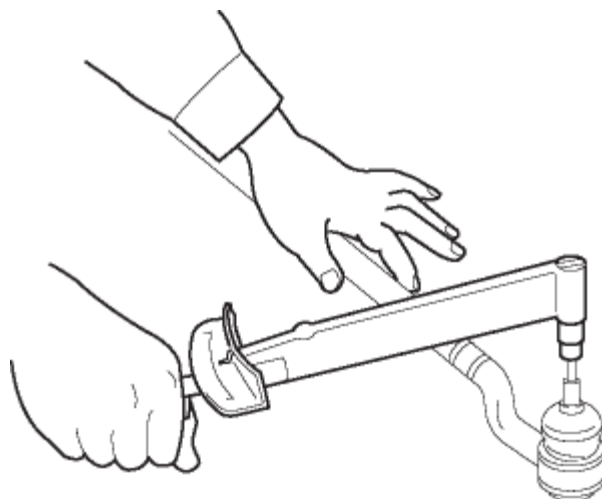
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## 2008 - MX-5 - Suspension

### REAR LATERAL LINK (UPPER) INSPECTION

1. Remove the rear lateral link (upper) from the vehicle. (See [REAR LATERAL LINK \(UPPER\) REMOVAL/INSTALLATION.](#))
2. Inspect the link for bending or damage. If there is any malfunction, replace the link.
3. Inspect the ball joint for looseness. If there is any malfunction, replace the ball joint.
4. Rotate the ball joint **5 times**.
5. Measure the ball-joint rotational torque using an Allen wrench and a torque wrench.



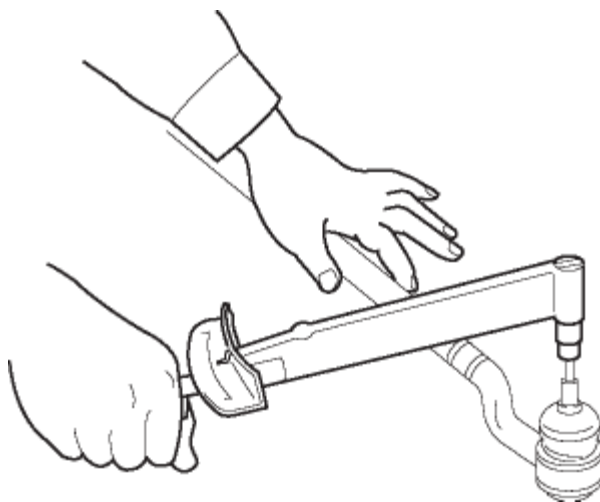
#### Rear lateral link (upper) ball joint rotational torque

- 0.4—2.8 N·m {5—28 kgf·cm, 4—24 in·lbf}
- If not within the specification, replace the rear lateral link (upper). (See [REAR LATERAL LINK \(UPPER\) REMOVAL/INSTALLATION.](#))

## 2008 - MX-5 - Suspension

### REAR LATERAL LINK (LOWER) INSPECTION

1. Remove the rear lateral link (lower) from the vehicle. (See [REAR LATERAL LINK \(LOWER\) REMOVAL/INSTALLATION.](#))
2. Inspect the link for bending or damage. If there is any malfunction, replace the link.
3. Inspect the ball joint for looseness. If there is any malfunction, replace the ball joint.
4. Rotate the ball joint **5 times**.
5. Measure the ball-joint rotational torque using an Allen wrench and a torque wrench.



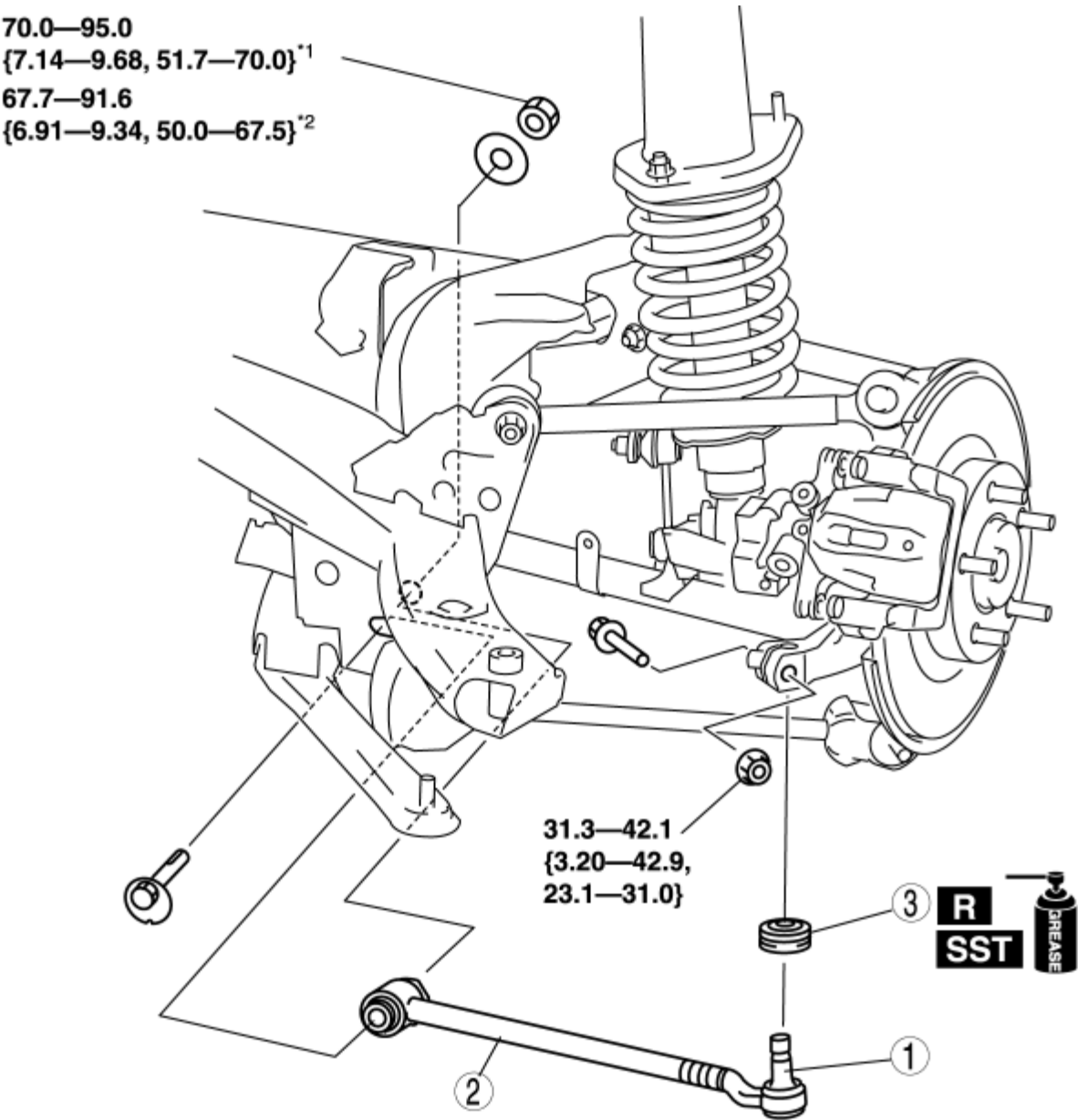
#### Rear lateral link (lower) ball joint rotational torque

- 0.4—2.8 N·m {5—28 kgf·cm, 4—24 in·lbf}
- If not within the specification, replace the rear lateral link (lower). (See [REAR LATERAL LINK \(LOWER\) REMOVAL/INSTALLATION.](#))

2008 - MX-5 - Suspension

TOE CONTROL LINK REMOVAL/INSTALLATION

- 1. Remove in the order indicated in the table.
- 2. Install in the reverse order of removal.
- 3. Inspect the rear wheel alignment. (See [REAR WHEEL ALIGNMENT](#).)



<sup>\*1</sup>: [APPLIED VIN: JM1 NC26F\*8# 100001—JM1 NC26F\*8# 150956]

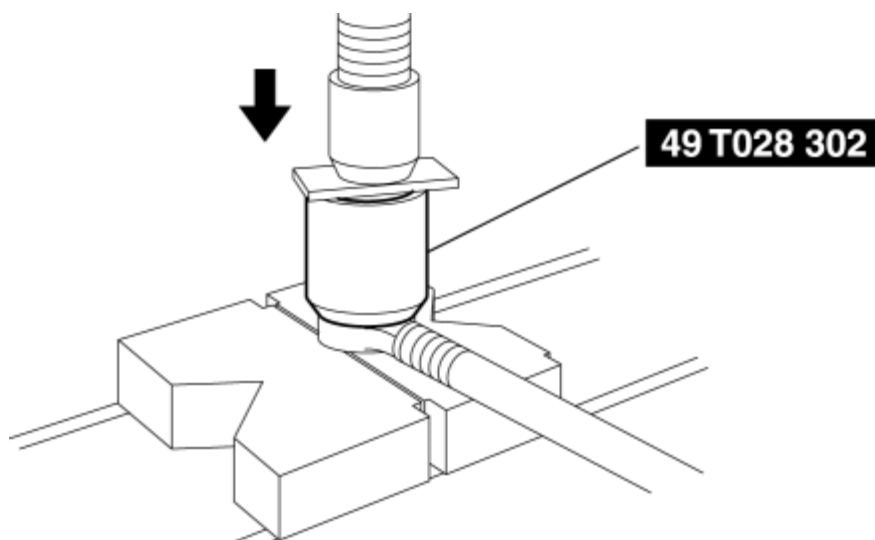
<sup>\*2</sup>: [APPLIED VIN: JM1 NC26F\*8# 150957—]

N·m {kgf·m, ft·lbf}

1	Toe control link ball joint (See <a href="#">Toe Control Link Ball Joint Installation Note</a> .)
2	Toe control link
3	Dust boot (See <a href="#">Dust Boot Installation Note</a> .)

### Dust Boot Installation Note

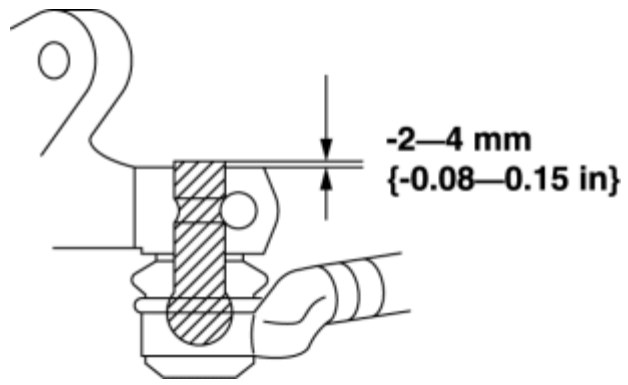
1. Wipe the grease off the ball joint stud.
2. Fill the inside of the new dust boot with grease.
3. Using the **SST**, install the dust boot to the ball joint.



4. Wipe off the excess grease.

### Toe Control Link Ball Joint Installation Note

1. Install the toe control link ball joint so that the ball joint stud projection is within **-2—4 mm** **{-0.08—0.15 in}**.



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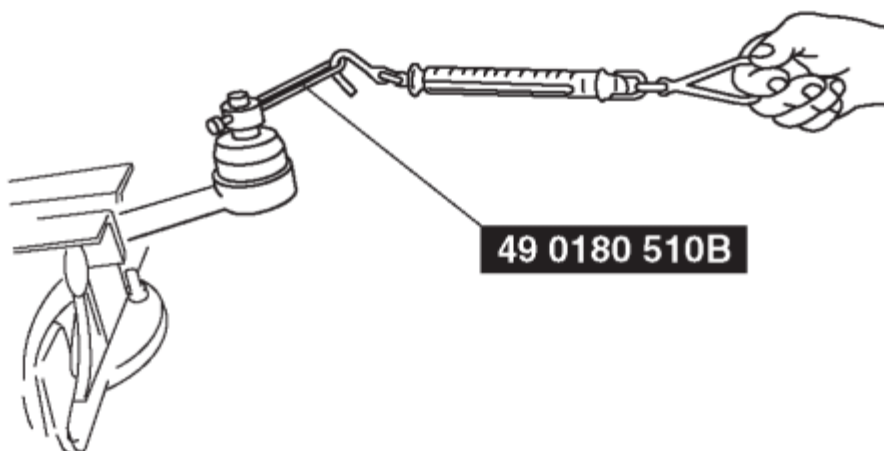
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## 2008 - MX-5 - Suspension

### TOE CONTROL LINK INSPECTION

1. Remove the toe control link from the vehicle. (See [TOE CONTROL LINK REMOVAL/INSTALLATION](#).)
2. Inspect the lateral link for bending or damage. If there is any malfunction, replace the lateral link.
3. Inspect the ball joint for looseness. If there is any malfunction, replace the ball joint.
4. Rotate the ball joint **5 times**.
5. Install the **SST** to the ball stud, and measure the ball joint rotational torque using a pull scale.



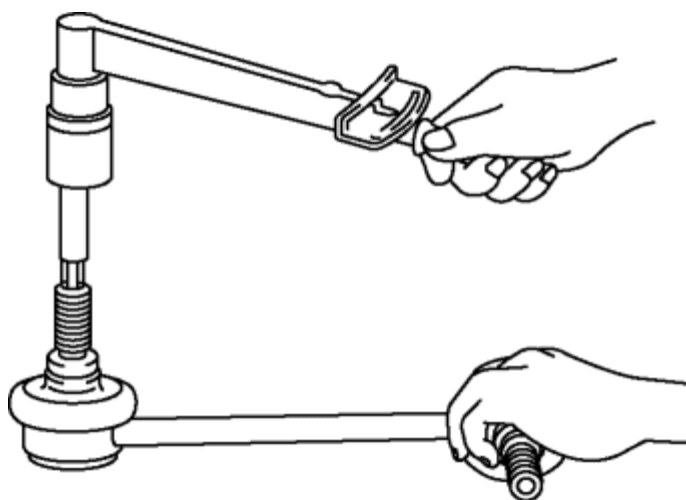
#### Toe control link ball joint rotational torque

- 0.3—2.2 N·m {4—22 kgf·cm, 3—19 in·lbf}
- Pull scale reading: 3—22 N {0.3—2.2 kgf, 0.7—4.9 lbf}
- If not within the specification, replace the toe control link. (See [TOE CONTROL LINK REMOVAL/INSTALLATION](#).)

## 2008 - MX-5 - Suspension

### REAR STABILIZER CONTROL LINK INSPECTION

1. Remove the stabilizer control link from the vehicle. (See [REAR STABILIZER REMOVAL/INSTALLATION](#).)
2. Inspect the link for bending or damage. If there is any malfunction, replace the link.
3. Rotate the ball joint **10 times**, and rock the ball joint **10 times**.
4. Measure the ball-joint rotational torque using an Allen wrench and a torque wrench.



#### Stabilizer control link ball joint rotational torque

- 0.23—0.47 N·m {2.35—4.79 kgf·cm, 2.04—4.15 in·lbf}
- If not within the specification, replace the stabilizer control link ball joint. (See [REAR STABILIZER REMOVAL/INSTALLATION](#).)



2008 - MX-5 - Suspension

SUSPENSION TECHNICAL DATA

Front wheel alignment [16-inch wheel]

Item			Specification
Total toe-in	Tire [Tolerance $\pm 4$ mm {0.15 in}]	(mm {in})	2 {0.08}
	Rim inner	(mm {in})	1.2 $\pm$ 2.4 {0.05 $\pm$ 0.09}
		degree	0°11'±22'
Steering angle [Tolerance $\pm 3^\circ$ ]		Inner	38°42'
		Outer	32°54'
Steering axis inclination (Reference value)			10°39'
Camber [Tolerance $\pm 1^\circ$ ]	Vehicle height: From the end of the front fender to the center of the wheel (mm {in})	356—365 {14.1—14.3}	-0°41'
		366—375 {14.5—14.7}	-0°22'
		376—385 {14.8—15.1}	-0°06'
		386—395 {15.2—15.5}	0°09'
		396—405 {15.6—15.9}	0°21'
Caster		354—363 {14.0—14.2}	6°27'
		364—373 {14.4—14.6}	6°13'

[Tolerance ±1°]	Vehicle height: From the end of the rear fender to the center of the wheel (mm {in})	374—383 { 14.8—15.0 }	5°59'
		384—393 { 15.2—15.4 }	5°45'
		394—403 { 15.6—15.8 }	5°31'

NOTE:

- Unloaded vehicle: Fuel tank is full. Engine coolant and engine oil are at specified level. Jack and tools are in designated position.
- Difference between the left and right dimension for camber and caster is within 1°.

Front wheel alignment [17-inch wheel]

Item			Specification
Total toe-in	Tire [Tolerance ±4 mm {0.15 in}]	(mm {in})	2 {0.08}
	Rim inner	(mm {in})	1.4±2.8 {0.06±0.11}
		degree	0°11'±22'
Steering angle [Tolerance ±3°]		Inner	38°42'
		Outer	32°54'
Steering axis inclination (Reference value)			10°47'
Camber [Tolerance ±1°]	Vehicle height: From the end of the front fender to the center of the wheel (mm {in})	351—360 { 13.8—14.1 }	-0°51'
		361—370 { 14.3—14.5 }	-0°31'
		371—380 { 14.7—14.9 }	-0°14'
		381—390 { 15.0—15.3 }	0°02'
		391—400 { 15.4—15.7 }	0°15'

Caster [Tolerance ±1°]	Vehicle height: From the end of the rear fender to the center of the wheel (mm {in})	349—358 { 13.8—14.0}	6°34'
		359—368 { 14.2—14.4}	6°20'
		369—378 { 14.6—14.8}	6°06'
		379—388 { 15.0—15.2}	5°53'
		389—398 { 15.4—15.6}	5°39'

#### NOTE:

- Unloaded vehicle: Fuel tank is full. Engine coolant and engine oil are at specified level. Jack and tools are in designated position.
- Difference between the left and right dimension for camber and caster is within **1°**.

#### Rear wheel alignment [16-inch wheel]

Item			Specification
Total toe-in	Tire [Tolerance ±4 mm {0.15 in}]	(mm {in})	3 {0.12}
	Rim inner	(mm {in})	1.8±2.4 {0.071±0.094}
		degree	0°17'±22'
Camber [Tolerance ±1°]	Vehicle height: From the end of the rear fender to the center of the wheel (mm {in})	354—363 { 14.0—14.2}	-1°33'
		364—373 { 14.4—14.6}	-1°18'
		374—383 { 14.8—15.0}	-1°04'
		384—393 { 15.2—15.4}	-0°54'
		394—403 { 15.6—15.8}	-0°45'

NOTE:

- Unloaded vehicle: Fuel tank is full. Engine coolant and engine oil are at specified level. Jack and tools are in designated position.
- Difference between the left and right camber angle is within 1°.

Rear wheel alignment [17-inch wheel]

Item			Specification
Total toe-in	Tire [Tolerance ±4 mm {0.15 in}]	(mm {in})	3 {0.12}
	Rim inner	(mm {in})	2.2±2.8 {0.083±0.110}
		degree	0°17'±22'
Camber [Tolerance ±1°]	Vehicle height: From the end of the rear fender to the center of the wheel (mm {in})	349—358 { 13.8 —14.0}	-1°42'
		359—368 { 14.2 —14.4}	-1°25'
		369—378 { 14.6 —14.8}	-1°11'
		379—388 { 15.0 —15.2}	-0°59'
		389—398 { 15.4 —15.6}	-0°49'

NOTE:

- Unloaded vehicle: Fuel tank is full. Engine coolant and engine oil are at specified level. Jack and tools are in designated position.
- Difference between the left and right camber angle is within 1°.

Wheel and tire

Item		Specification	
Standard tire and wheel			
	Size	16 × 6 1/2J	17 × 7J

Wheel	Offset	(mm {in})	55 {2.17}	
	Pitch circle diameter	(mm {in})	114.3 {4.50}	
	Material		Aluminum alloy	
Tire	Size		205/50R16 87V	205/45R17 84W
	Air pressure (kPa {kgf/cm <sup>2</sup> , psi})	Front	200 {2.0, 29}	
		Rear	200 {2.0, 29}	
	Remaining tread	(mm {in})	1.6 {0.06}	
Wheel and tire	Wheel and tire runout	Radial direction	1.5 {0.06} max.	
	(mm {in})	Lateral direction	2.0 {0.08} max.	
	Wheel imbalance	(g {oz})	Adhesive type* <sup>1</sup> : 13 {0.46} max. Knock type* <sup>2</sup> : 8 {0.28} max.	Adhesive type* <sup>1</sup> : 11 {0.39} max. Knock type* <sup>2</sup> : 7 {0.25} max.

\*1  
**Total weight exceeds 160 g {5.65 oz}.**

\*2  
**One balance weight: 60 g {2.12 oz} max. If the total weight exceeds 100 g {3.53 oz} on one side, rebalance after moving the tire around on the rim. Do not use three or more balance weights.**

Item	Specification
Front upper arm ball joint rotational torque	0.3—2.2 N·m {4—22 kgf·cm, 3—19 in·lbf}
Front lower arm ball joint rotational torque	0.4—2.9 N·m {5—29 kgf·cm, 4—25 in·lbf}
Front stabilizer control link ball joint rotational torque	0.2—2.0 N·m {3—20 kgf·cm, 2—17 in·lbf}
Rear trailing link (upper) ball joint rotational torque	0.4—3.3 N·m {5—33 kgf·cm, 4—29 in·lbf}

Rear lateral link (upper) ball joint rotational torque	0.4—2.8 N·m {5—28 kgf·cm, 4—24 in·lbf}
Rear lateral link (lower) ball joint rotational torque	0.4—2.8 N·m {5—28 kgf·cm, 4—24 in·lbf}
Toe control link ball joint rotational torque	0.3—2.2 N·m {4—22 kgf·cm, 3—19 in·lbf} Pull scale reading: 3—22 N {0.3—2.2 kgf, 0.7—4.9 lbf}
Rear stabilizer control link ball joint rotational torque	0.23—0.47 N·m {2.35—4.79 kgf·cm, 2.04—4.15 in·lbf}

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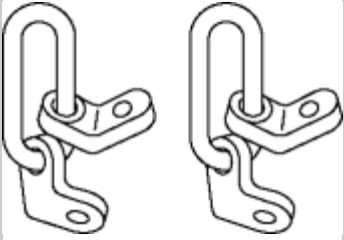
2008 - MX-5 - Suspension

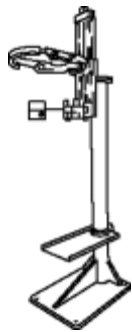
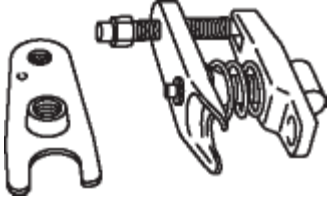

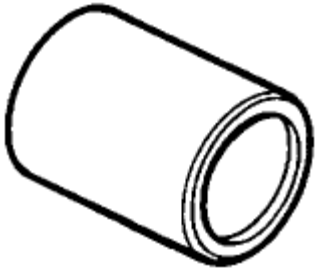
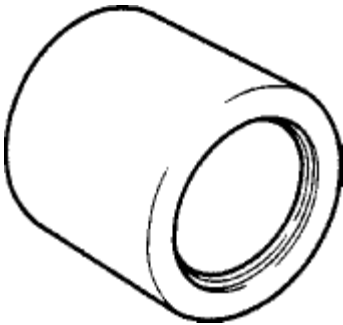
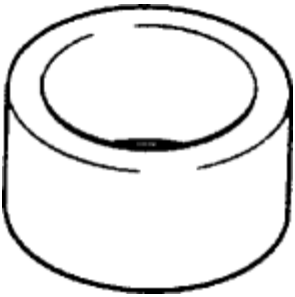
SUSPENSION

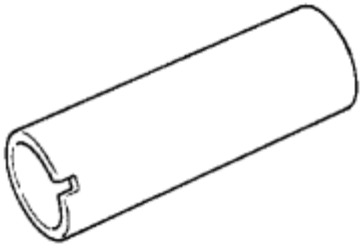
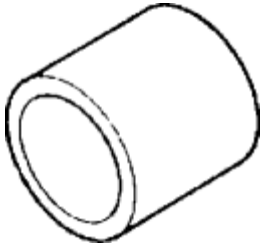
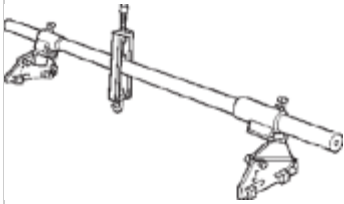
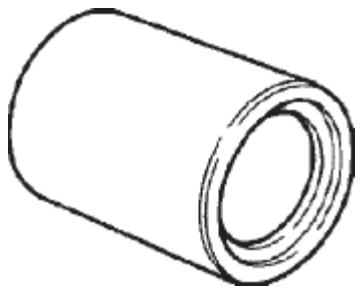
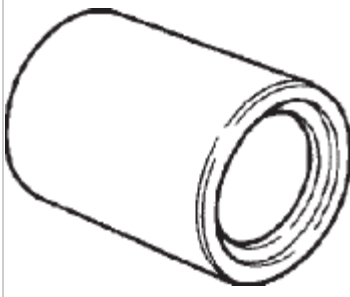
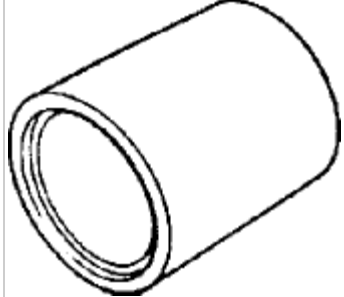
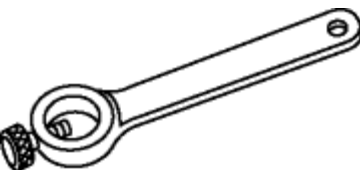
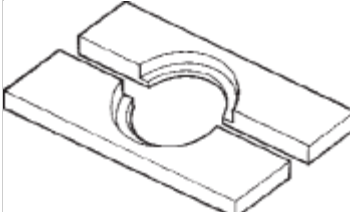
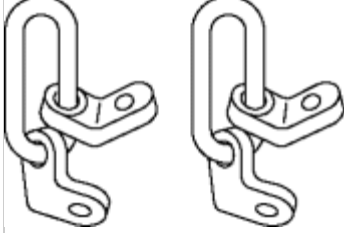
1: Mazda SST number

2: Global SST number

Example

1: 49 UN30 3050	
2: 303-050	
Engine lifting bracket	

1: 49 T034 1A0 2: — Coil spring compressor set		1: 49 T028 3A0 2: — Ball joint puller set		1: 49 T034 202A 2: — Crankshaft holding tool pins	
1: 49 D034 202 2: — Support block		1: 49 U034 204 2: — Dust boot installer		1: 49 S010 301 2: — Oil seal installer	
1: 49 S032 333 2: — Bearing		1: 49 W027 003 2: —		1: 49 E017 5A0 2: — Engine	

installer		Bearing installer		support	
1: 49 D034 201 2: — Dust boot installer		1: 49 H028 301 2: — Dust boot installer		1: 49 T028 302 2: — Dust boot installer	
1: 49 0180 510B 2: — Preload measuring attachment		1: 49 W017 101 2: — Clutch hub remover		1: 49 UN30 3050 2: 303-050 Engine lifting bracket	



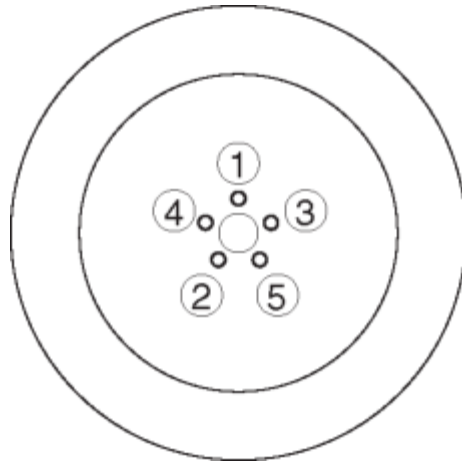
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## 2008 - MX-5 - DriveLine/Axle

### GENERAL PROCEDURES (FRONT AND REAR AXLES)

#### Wheel And Tire Installation

1. When installing the wheels and tires, tighten the wheel nuts in a criss-cross pattern to the following tightening torque.



#### Tightening torque

- 88—118 N·m { 9.00—12.0 kgf·m, 65.0—87.0 ft·lbf }

#### Connector Disconnection

1. Disconnect the negative battery cable before performing any work that requires handling of connectors. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)

#### Suspension Links Removal/Installation

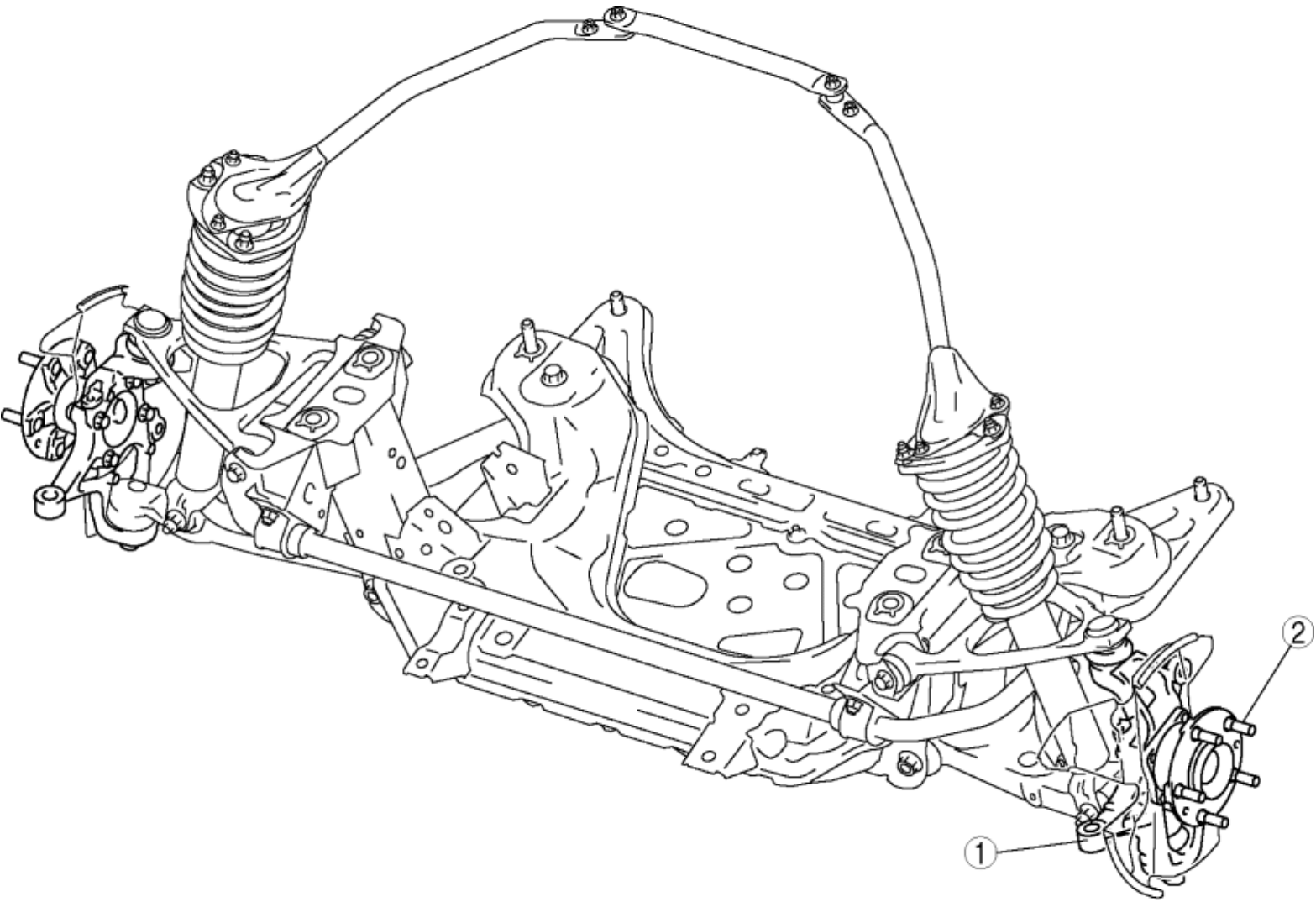
1. For the joint sections with rubber bushings, raise the vehicle using a lift, and then temporarily tighten the installation bolts and nuts. Lower the vehicle to the ground and tighten them completely with the specified torque.

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2008 - MX-5 - DriveLine/Axle

FRONT AXLE LOCATION INDEX



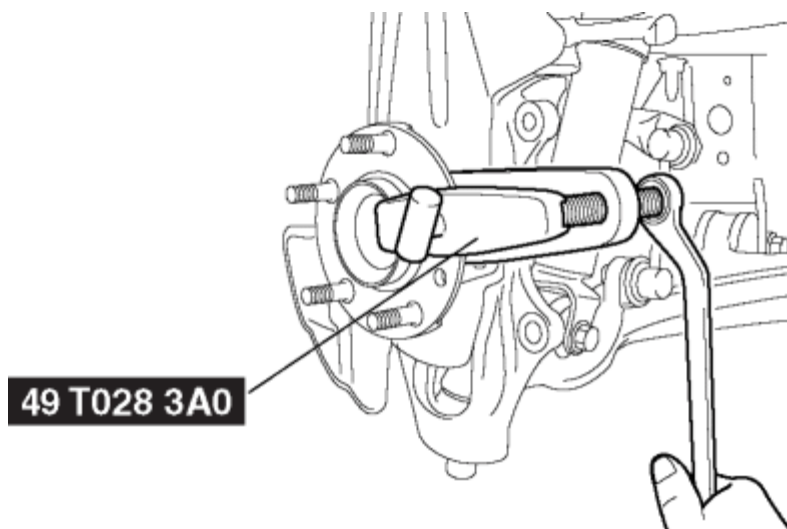
1	Wheel hub, steering knuckle (See <a href="#">WHEEL HUB, STEERING KNUCKLE INSPECTION.</a> ) (See <a href="#">WHEEL HUB, STEERING KNUCKLE REMOVAL/INSTALLATION.</a> )
2	Wheel hub bolt (See <a href="#">FRONT WHEEL HUB BOLT REPLACEMENT.</a> )



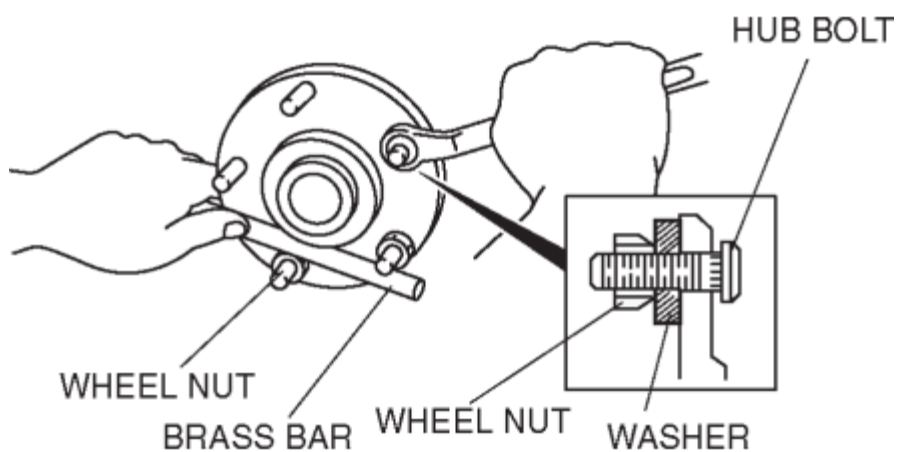
## 2008 - MX-5 - DriveLine/Axle

### FRONT WHEEL HUB BOLT REPLACEMENT

1. Remove the brake caliper component and disc plate.
2. Remove the wheel hub bolt using the **SST** as shown in the figure.



3. Place a new wheel hub bolt in the wheel hub.
4. Install the wheel hub bolt by placing a proper sized washer on the hub, and tightening the nut as shown in the figure.

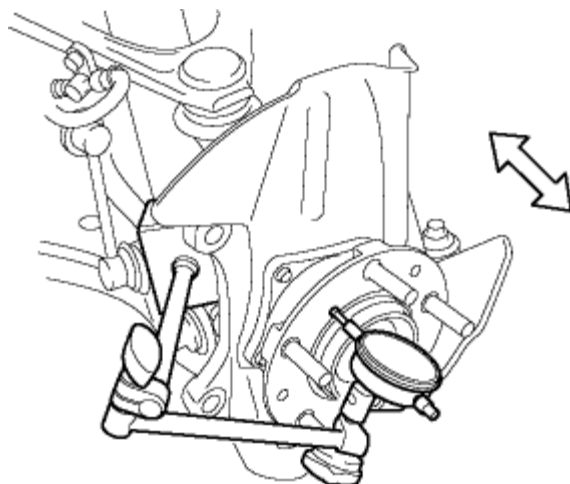


## 2008 - MX-5 - DriveLine/Axle

### WHEEL HUB, STEERING KNUCKLE INSPECTION

#### Wheel Bearing Looseness Inspection

1. Install the magnetic vane and dial gauge as shown in the figure, and inspect the wheel bearing for axial looseness.



- If it exceeds the maximum specification, replace the wheel hub component.

#### Maximum front wheel bearing play

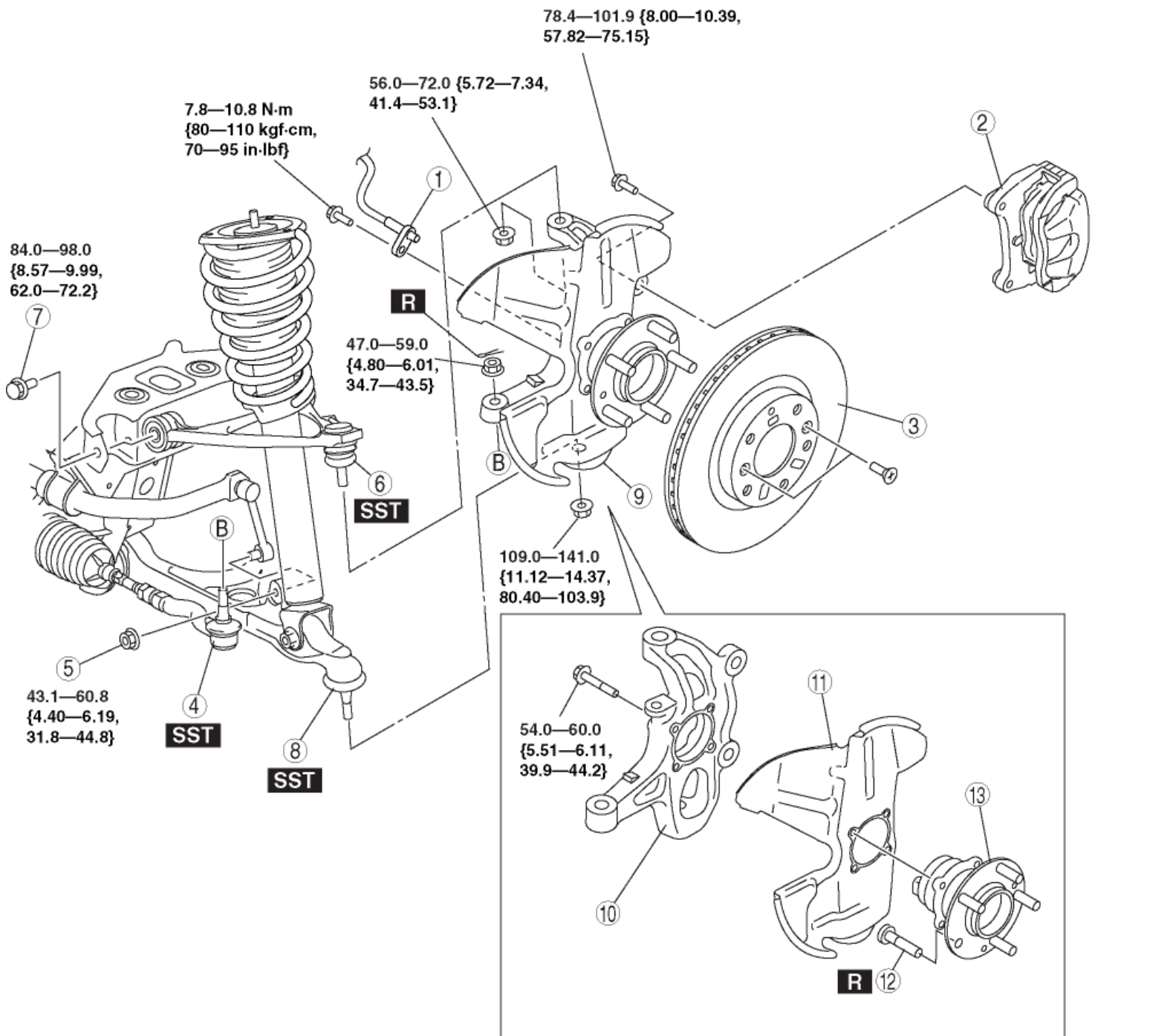
- 0.05 mm {0.002 in}

## 2008 - MX-5 - DriveLine/Axle

### WHEEL HUB, STEERING KNUCKLE REMOVAL/INSTALLATION

#### CAUTION:

- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the wiring harness if it is pulled by mistake. Before performing the following procedures, disconnect the ABS wheel-speed sensor harness connector (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.
1. Remove in the order indicated in the table.
  2. Install in the reverse order of removal.
  3. After installation, inspect front wheel alignment. (See [FRONT WHEEL ALIGNMENT](#).)



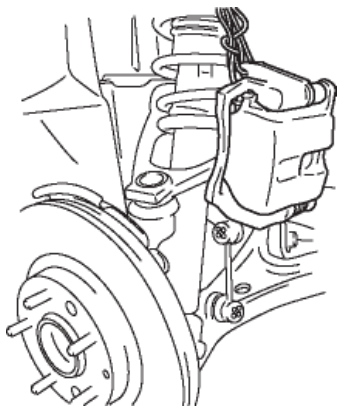
N·m {kgf·m, ft·lbf}

1	ABS wheel-speed sensor
2	Brake caliper component (See <a href="#">Brake Caliper Component Removal Note.</a> )
3	Disc plate
4	Tie-rod end (See <a href="#">STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION.</a> )

5	Stabilizer control link nut (lower)
6	Front upper arm ball joint (See <a href="#">FRONT LOWER ARM REMOVAL/INSTALLATION.</a> )
7	Front upper arm bolt
8	Front lower arm ball joint (See <a href="#">FRONT LOWER ARM REMOVAL/INSTALLATION.</a> )
9	Steering knuckle component
10	Steering knuckle
11	Dust cover
12	Wheel hub bolt (See <a href="#">Wheel Hub Bolt Removal Note.</a> ) (See <a href="#">Wheel Hub Bolt Installation Note.</a> )
13	Wheel hub component

**Brake Caliper Component Removal Note**

- 1. Suspend the brake caliper component using a cable or equivalent.

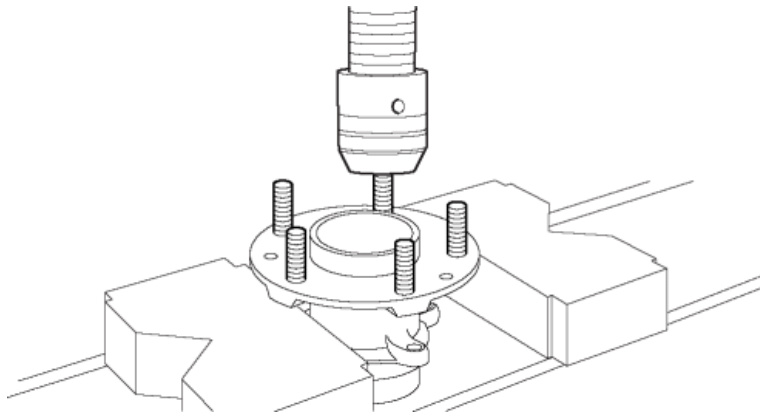


**Wheel Hub Bolt Removal Note**

**NOTE:**

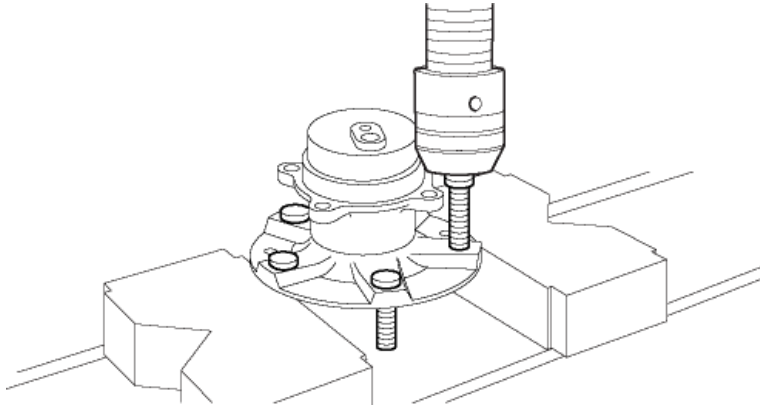
- Remove the wheel hub bolt only if there is an abnormality.
- 1. Remove the wheel hub bolts from the wheel hub using a press.





### Wheel Hub Bolt Installation Note

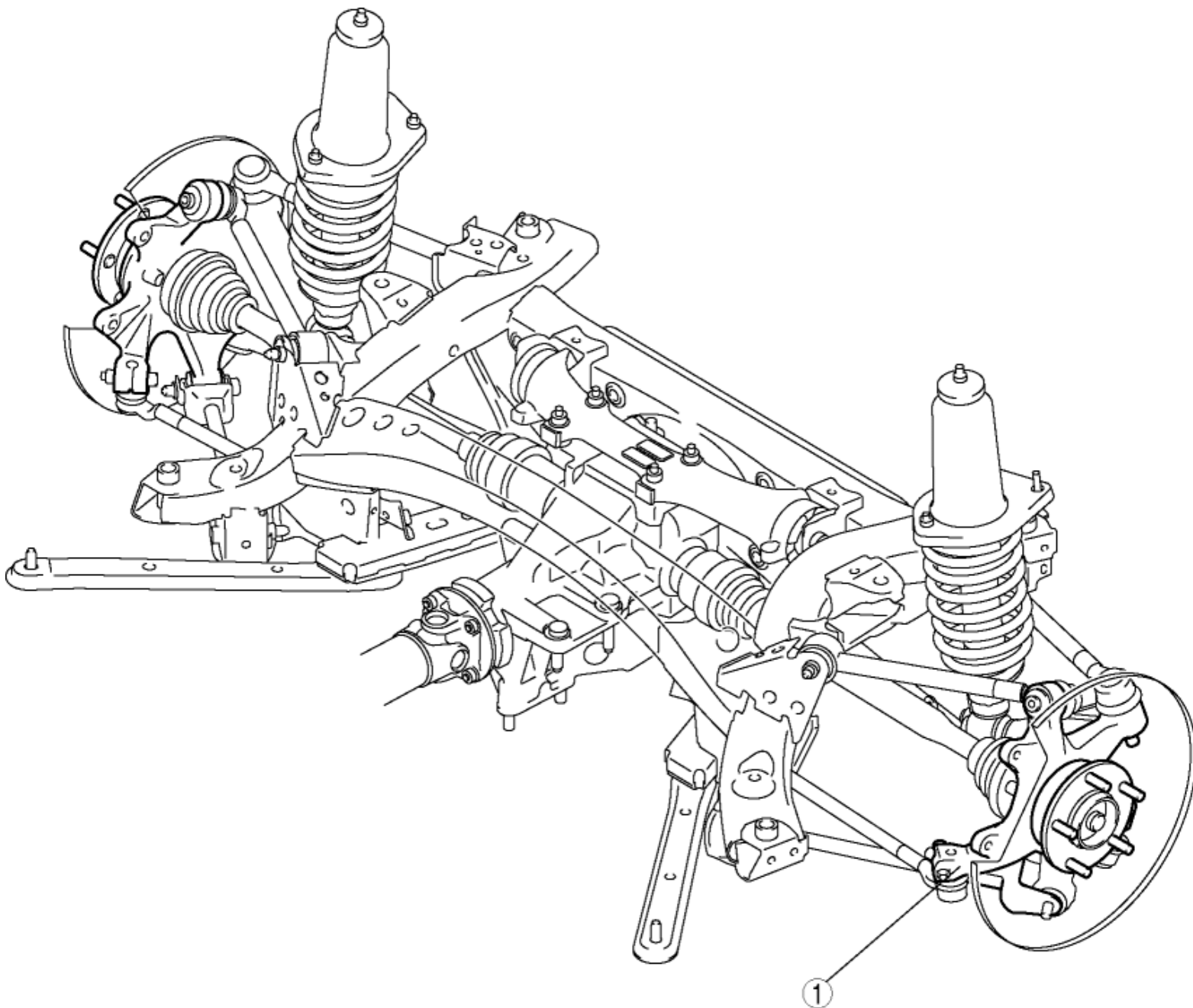
1. Press in new wheel hub bolts into the wheel hub using a press.



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## 2008 - MX-5 - DriveLine/Axle

### REAR AXLE LOCATION INDEX



1 Wheel hub, rear knuckle

(See [WHEEL HUB COMPONENT INSPECTION.](#))

(See [WHEEL HUB COMPONENT REMOVAL/INSTALLATION.](#))

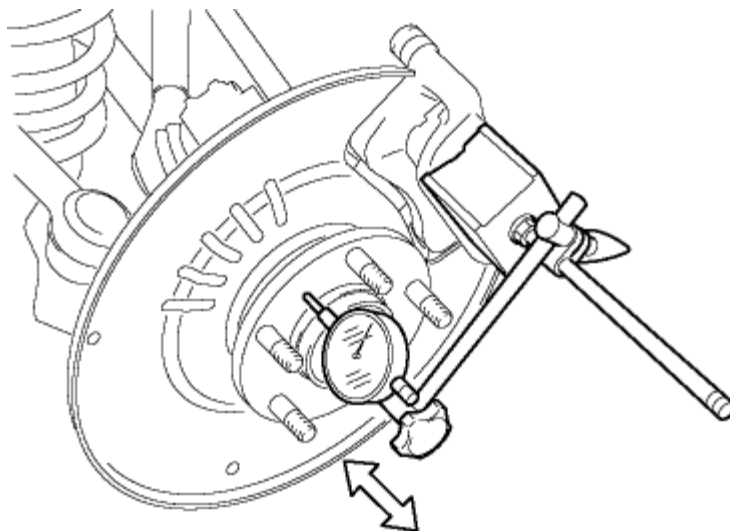


## 2008 - MX-5 - DriveLine/Axle

### WHEEL HUB COMPONENT INSPECTION

#### Wheel Bearing Looseness Inspection

1. Install the magnetic vane and dial gauge as shown in the figure, and inspect the wheel bearing for axial looseness.



- If it exceeds the maximum specification, replace the wheel hub component.

#### **Maximum rear wheel bearing play**

- 0.05 mm {0.002 in}

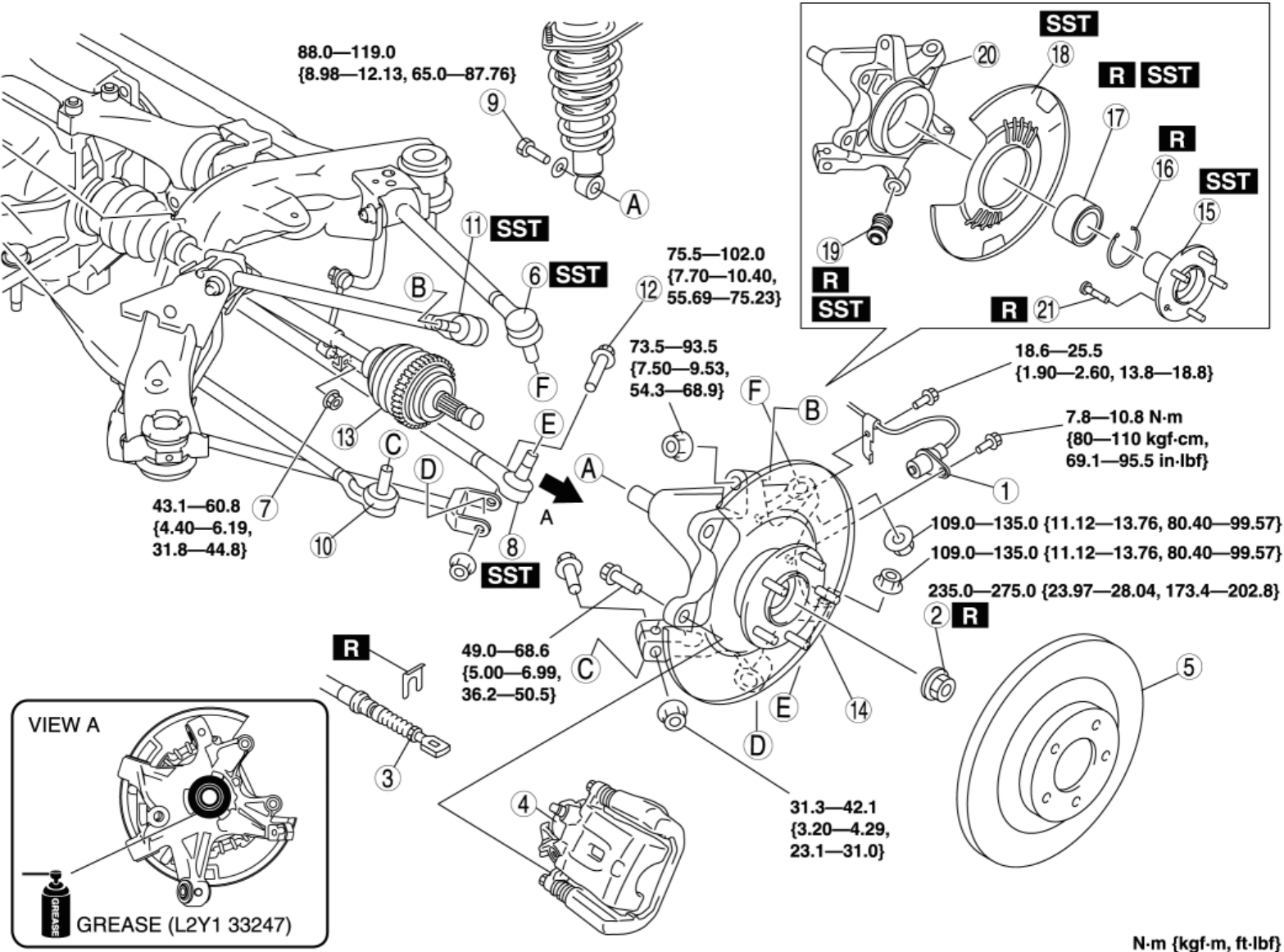
2008 - MX-5 - DriveLine/Axle

WHEEL HUB COMPONENT REMOVAL/INSTALLATION

CAUTION:

- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the wiring harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.

- Remove in the order indicated in the table.
- Install in the reverse order of removal.
- After installation, inspect rear wheel alignment. (See [REAR WHEEL ALIGNMENT](#).)



	(See <a href="#">Locknut Installation Note.</a> )
3	Parking brake cable
4	Brake caliper component (See <a href="#">Brake Caliper Component Removal Note.</a> )
5	Disc plate (See <a href="#">REAR BRAKE (DISC) REMOVAL/INSTALLATION.</a> )
6	Rear lateral link (upper) ball joint (See <a href="#">REAR LATERAL LINK (UPPER) REMOVAL/INSTALLATION.</a> )
7	Stabilizer control link nut (lower) (See <a href="#">REAR STABILIZER REMOVAL/INSTALLATION.</a> )
8	Rear lateral link (lower) ball joint (See <a href="#">REAR LATERAL LINK (LOWER) REMOVAL/INSTALLATION.</a> )
9	Shock absorber bolt (lower)
10	Toe control link ball joint
11	Rear trailing link (upper) ball joint (See <a href="#">REAR TRAILING LINK (UPPER) REMOVAL/INSTALLATION.</a> )
12	Rear trailing link (lower) bolt (outer side)
13	Rear drive shaft (See <a href="#">Rear Drive shaft Removal Note.</a> )
14	Rear knuckle component (See <a href="#">Rear Knuckle Component Installation Note.</a> )
15	Wheel hub component (See <a href="#">Wheel Hub Component Removal Note.</a> ) (See <a href="#">Wheel Hub Component Installation Note.</a> )
16	Retaining ring
17	Wheel bearing (See <a href="#">Wheel Bearing Removal Note.</a> ) (See <a href="#">Wheel Bearing Installation Note.</a> )
18	Dust cover (See <a href="#">Dust Cover Removal Note.</a> ) (See <a href="#">Dust Cover Installation Note.</a> )
19	Bushing (See <a href="#">Bushing Removal Note.</a> ) (See <a href="#">Bushing Installation Note.</a> )
20	Rear knuckle

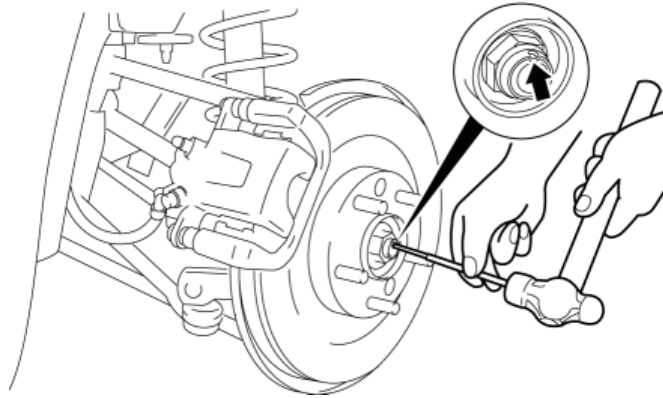
21 Wheel hub bolt

(See [Wheel Hub Bolt Removal Note](#).)

(See [Wheel Hub Bolt Installation Note](#).)

### Locknut Removal Note

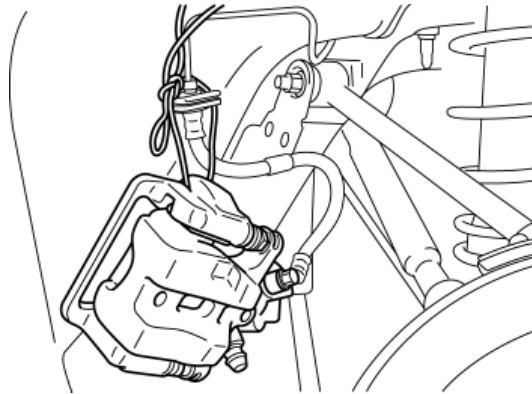
1. Lock the disc plate by applying the brakes.
2. Knock the crimped portion of the locknut outward using a chisel and a hammer.



3. Remove the locknut.

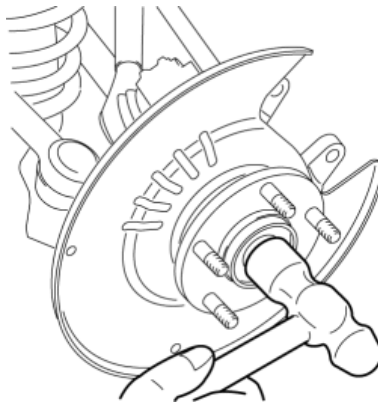
### Brake Caliper Component Removal Note

1. Suspend the brake caliper component using a cable or equivalent.



### Rear Drive shaft Removal Note

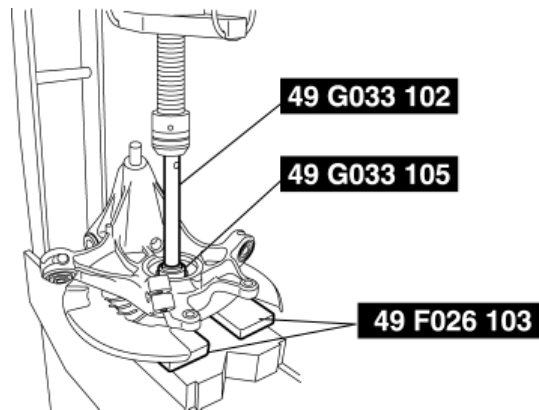
1. Temporarily install a spare nut onto the end of the rear drive shaft.
2. Tap the nut with a copper hammer to loosen the drive shaft from the wheel hub.



3. Separate the rear drive shaft from the wheel hub.

#### Wheel Hub Component Removal Note

1. Wind the **SST** and backing plate contact area with packing tape two times.
2. Remove the wheel hub component using the **SSTs**.

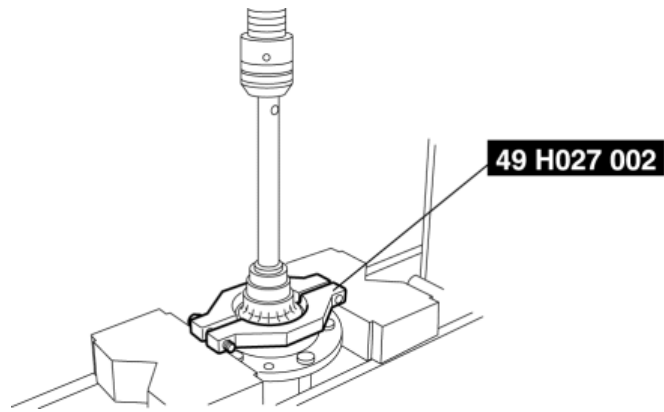


3. If the bearing inner race remains on the wheel hub component, use a chisel to secure a sufficient space for installing the **SST** between wheel hub component and bearing inner race.



4. Remove the bearing inner race using the **SST**.

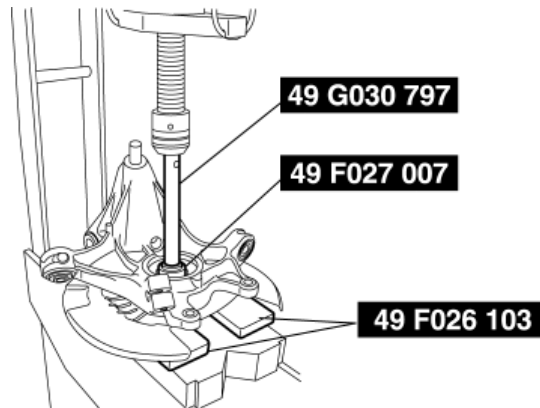




5. After removing the bearing, repair any backing plate deformation.

#### Wheel Bearing Removal Note

1. Wind the **SST** and backing plate contact area with packing tape two times.
2. Remove the wheel bearing from the rear knuckle using the **SSTs**.



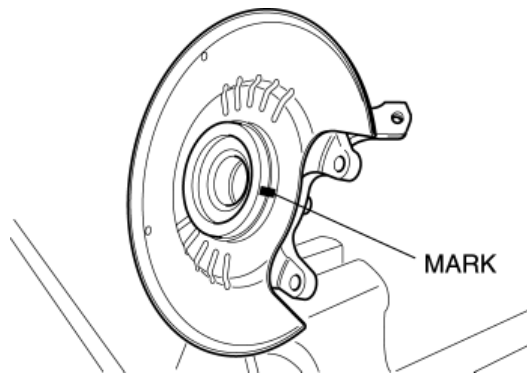
3. After removing the bearing, repair any backing plate deformation.

#### Dust Cover Removal Note

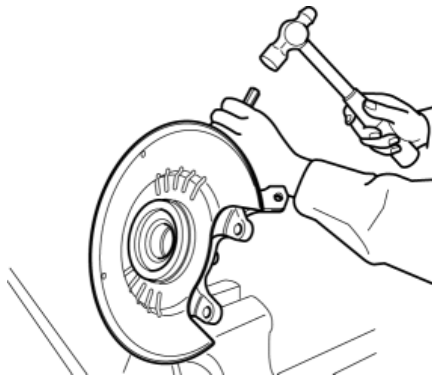
##### NOTE:

- Remove the dust cover only if there is an abnormality.

1. Place an alignment mark on the dust cover and rear knuckle for proper installation.

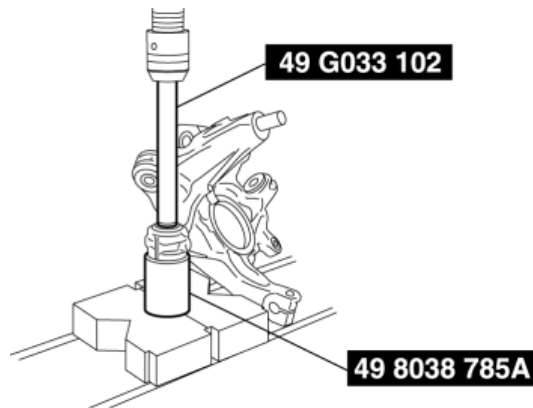


2. Remove the dust cover using a chisel.



### Bushing Removal Note

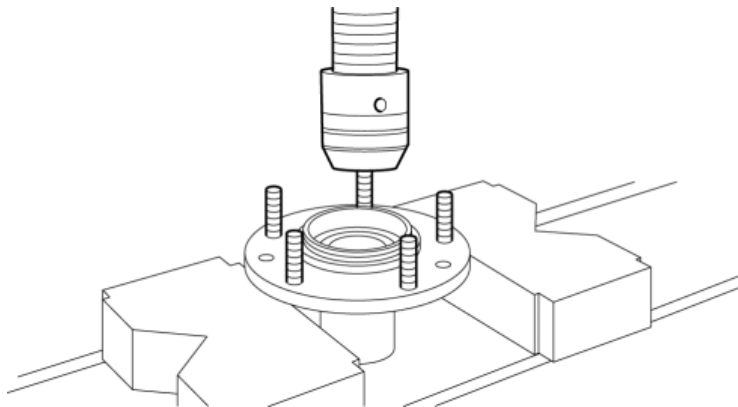
1. Remove the bushing from the rear knuckle using the **SSTs**.



### Wheel Hub Bolt Removal Note

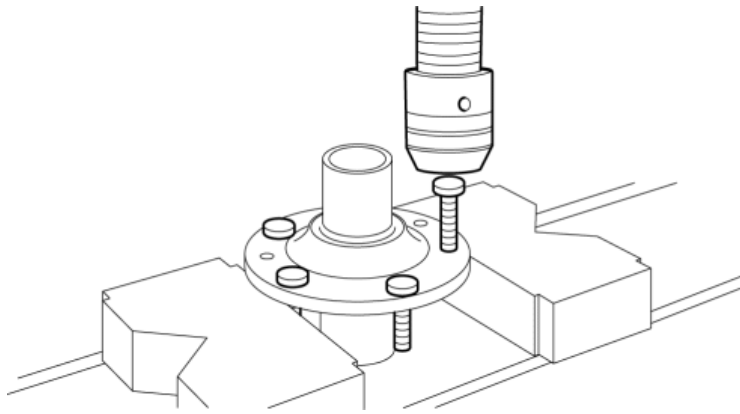
#### NOTE:

- Remove the wheel hub bolt only if there is an abnormality.
1. Remove the wheel hub bolts from the wheel hub using a press.



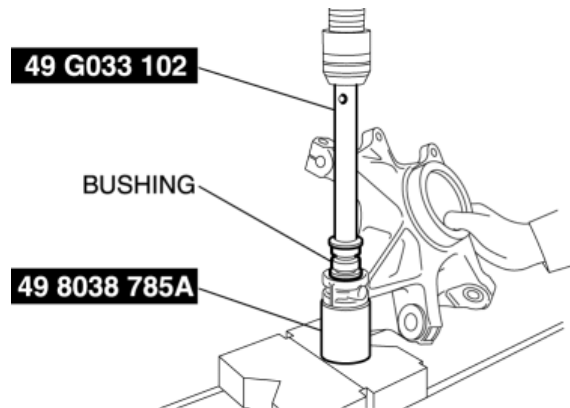
### Wheel Hub Bolt Installation Note

1. Press in new wheel hub bolts into the wheel hub using a press.



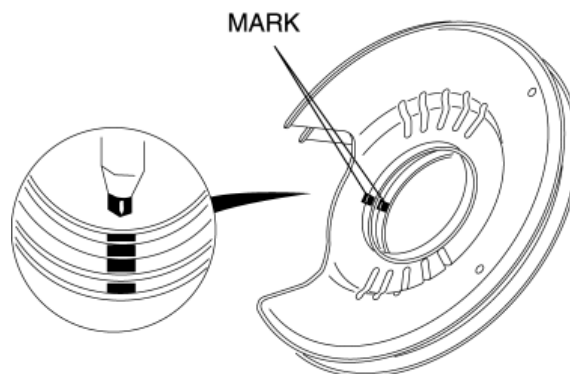
### Bushing Installation Note

1. Press the new bushing into the rear knuckle using the **SSTs**.

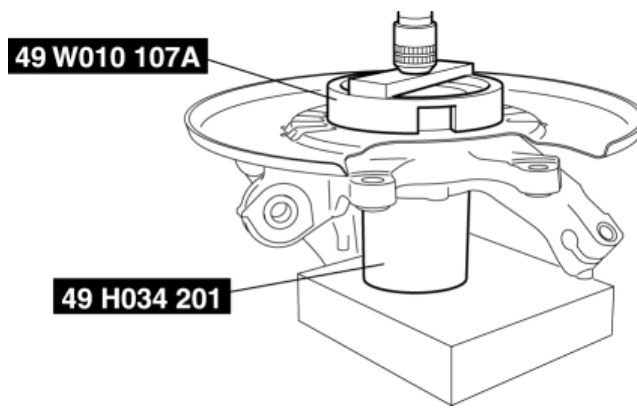


### Dust Cover Installation Note

1. Align the new and old dust covers and place alignment marks on the new dust cover.

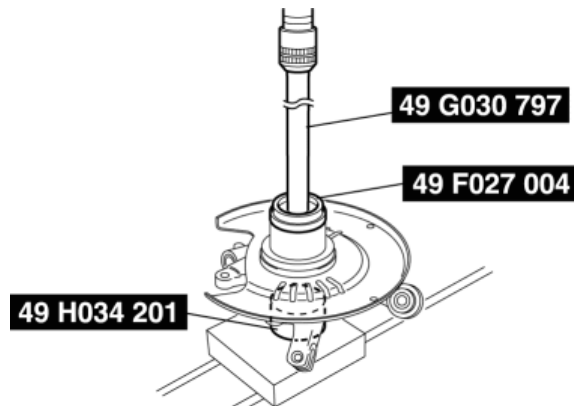


2. Align the marks on the new dust cover and rear knuckle.
3. Press the new dust cover onto the rear knuckle using the **SSTs**.



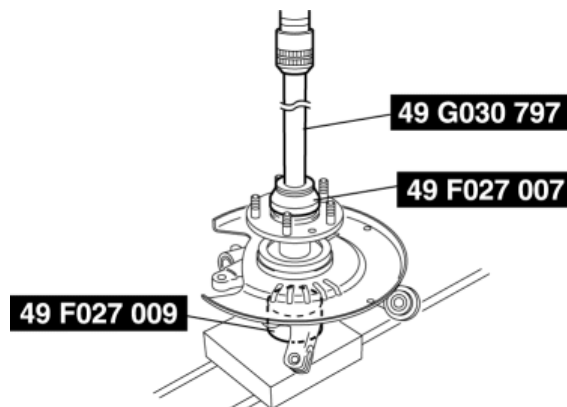
#### Wheel Bearing Installation Note

1. Install a new wheel bearing using the **SSTs**.



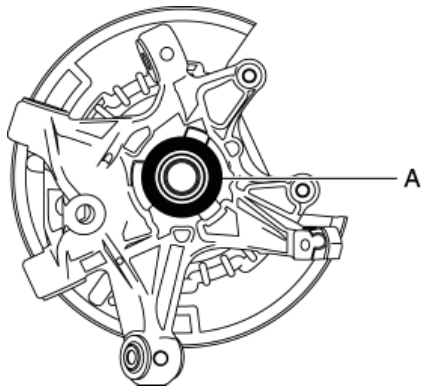
#### Wheel Hub Component Installation Note

1. Install the wheel hub component using the **SSTs**.



#### Rear Knuckle Component Installation Note

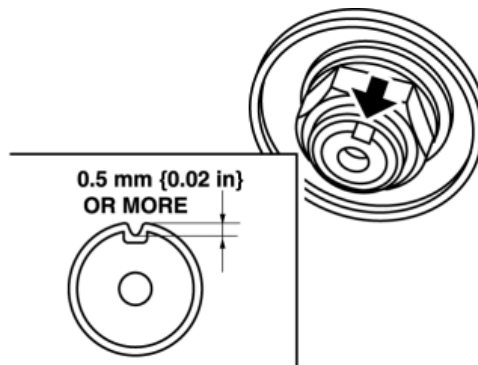
1. Apply grease (L2Y1 33247) to the wheel bearing inner race and drive shaft contact surface (Area A in figure).



2. Install the rear knuckle component.

#### Locknut Installation Note

1. Tighten a new locknut.
2. Install a new locknut and indent as shown to crimp the locknut, using a chisel and hammer.



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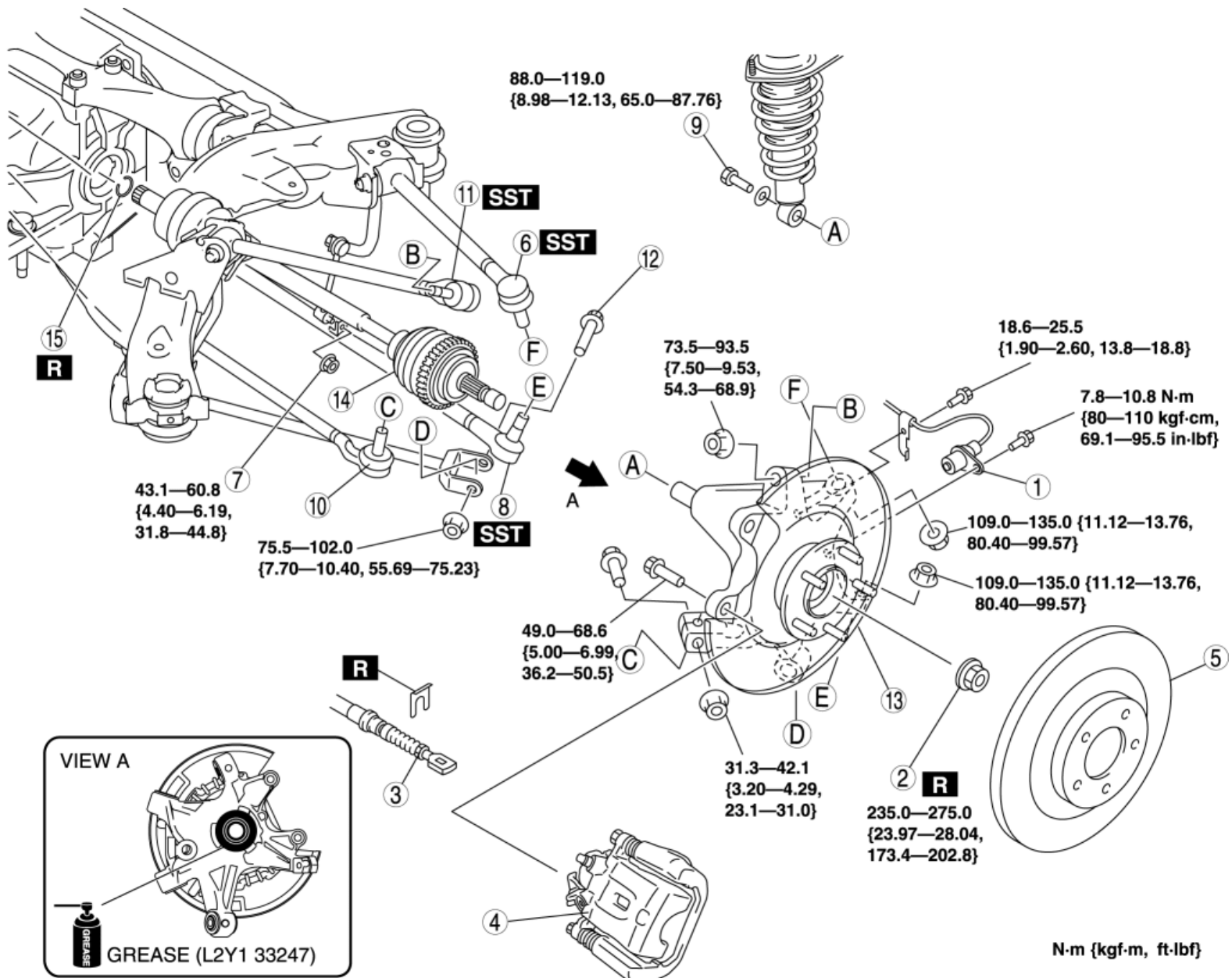
## 2008 - MX-5 - DriveLine/Axle

### REAR DRIVE SHAFT REMOVAL/INSTALLATION

#### CAUTION:

- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the wiring harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.

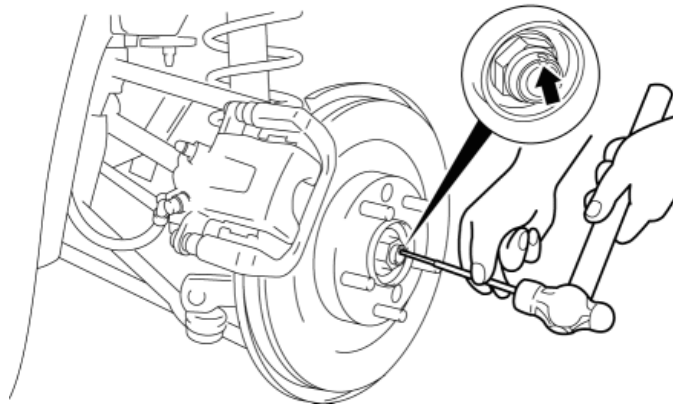
1. Drain the rear differential oil.
2. Remove in the order indicated in the table.
3. Install in the reverse order of removal.
4. Add rear differential oil. (See [DIFFERENTIAL OIL REPLACEMENT](#).)



1	ABS wheel-speed sensor
2	Locknut (See <a href="#">Locknut Removal Note.</a> ) (See <a href="#">Locknut Installation Note.</a> )
3	Parking brake cable
4	Brake caliper component (See <a href="#">Brake Caliper Component Removal Note.</a> )
5	Disc plate (See <a href="#">REAR BRAKE (DISC) REMOVAL/INSTALLATION.</a> )
6	Rear lateral link (upper) ball joint (See <a href="#">REAR LATERAL LINK (UPPER) REMOVAL/INSTALLATION.</a> )
7	Stabilizer control link (lower) (See <a href="#">REAR STABILIZER REMOVAL/INSTALLATION.</a> )
8	Rear lateral link (lower) ball joint (See <a href="#">REAR LATERAL LINK (LOWER) REMOVAL/INSTALLATION.</a> )
9	Shock absorber bolt (lower)
10	Toe control link ball joint
11	Rear trailing link (upper) ball joint (See <a href="#">REAR TRAILING LINK (UPPER) REMOVAL/INSTALLATION.</a> )
12	Rear trailing link (lower) bolt (outer side)
13	Rear knuckle component (See <a href="#">Rear Knuckle Component Installation Note.</a> )
14	Rear drive shaft (See <a href="#">Rear Drive Shaft Removal Note.</a> ) (See <a href="#">Rear Drive Shaft Installation Note.</a> )
15	Clip (See <a href="#">Clip Installation Note.</a> )

#### Locknut Removal Note

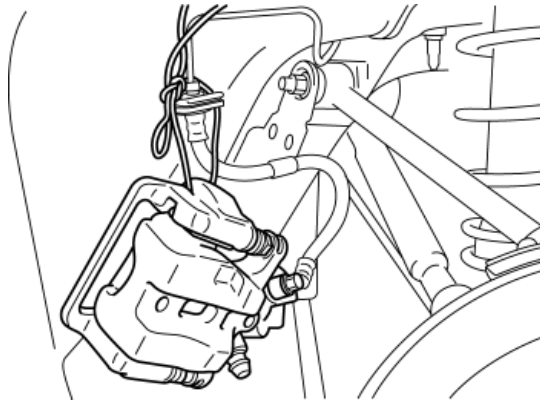
1. Lock the disc plate by applying the brakes.
2. Knock the crimped portion of the locknut outward using a chisel and a hammer.



3. Remove the locknut.

### Brake Caliper Component Removal Note

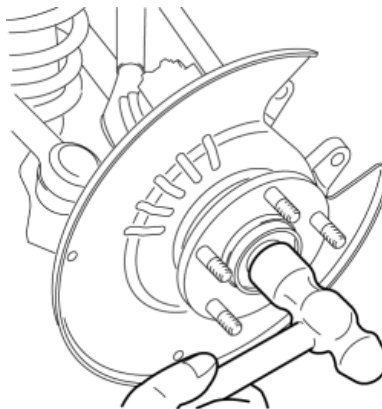
1. Suspend the brake caliper component using a cable or equivalent.



2. Temporarily tighten the wheel nut to prevent the disc plate from falling off.

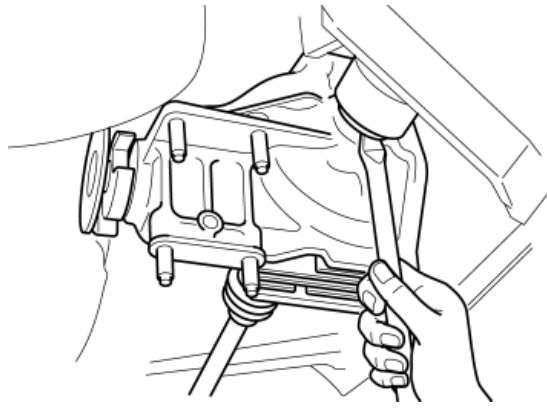
### Rear Drive Shaft Removal Note

1. Temporarily install a spare nut to the end of the rear drive shaft.
2. Knock the nut with copper hammer lightly and remove the rear drive shaft from the wheel hub.



3. Separate the rear drive shaft from the wheel hub.
4. Insert a tire lever or equivalent between the rear differential and differential side outer ring, and then remove the rear drive shaft.





**CAUTION:**

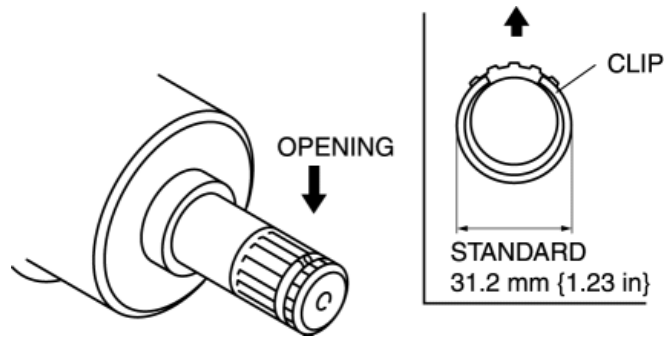
- The sharp edges of the drive shaft can slice or puncture the oil seal. Be careful not to damage the oil seal when removing the drive shaft from the differential.

5. Pull the rear drive shaft to the outer side of the vehicle and disconnect it from the rear differential.

6. To hold the rear knuckle component, install the rear lateral link (upper) to the rear knuckle temporarily after disconnecting the rear drive shaft.

**Clip Installation Note**

1. Point the opening of the new drive shaft clip upward, install it to the clip groove at the end of the rear drive shaft with the installation width within the specification.



**Standard**

- 31.2 mm {1.23 in}

2. After installing the clip, measure the outer diameter. If it exceeds the specification, reinstall the new clip.

**Rear Drive Shaft Installation Note**

1. Apply differential oil to the differential oil seal lip.

**CAUTION:**

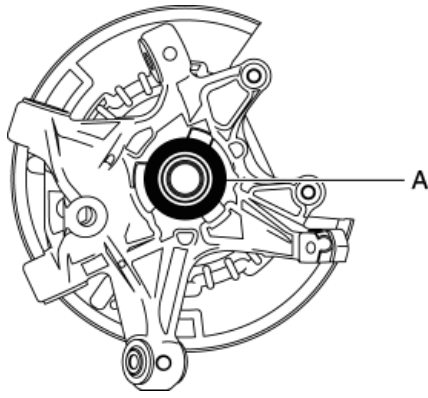
- The sharp edges of the rear drive shaft can slice or puncture the oil seal. Be careful not to damage the oil seal when installing the rear drive shaft from the rear differential.

2. Insert the rear drive shaft into the rear differential with the clip opening facing upward.

3. After installation, verify that the rear drive shaft is securely held by the clip by pulling the outer ring on the differential side towards the axle.

**Rear Knuckle Component Installation Note**

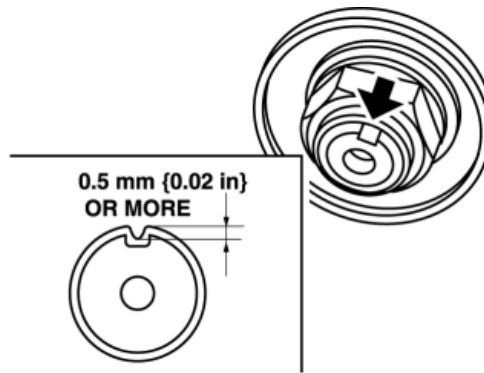
1. Apply grease (L2Y1 33247) to the wheel bearing inner race and drive shaft contact surface (Area A in figure).



2. Install the rear knuckle component.

#### Locknut Installation Note

1. Tighten a new locknut.
2. Crimp the locknut, using a chisel and hammer.



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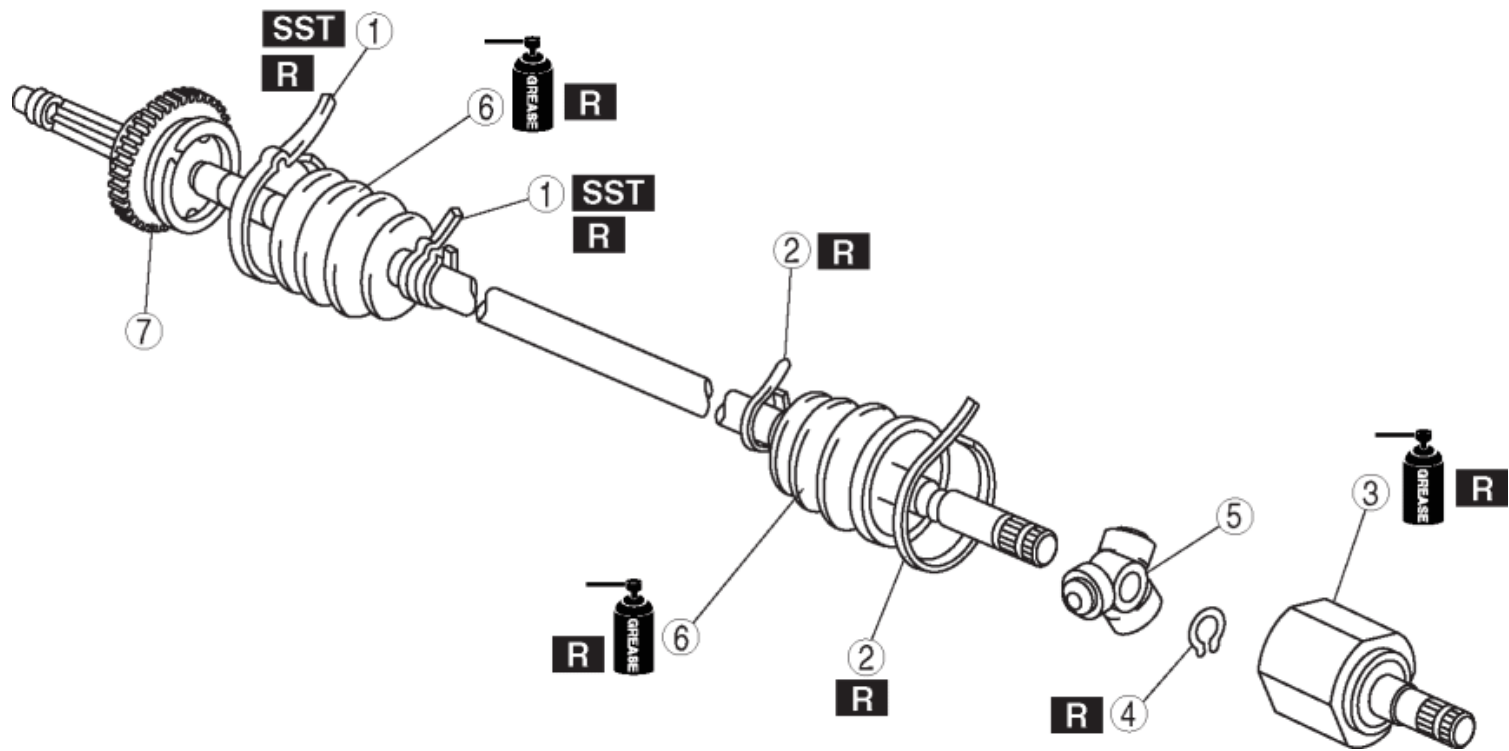
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2008 - MX-5 - DriveLine/Axle

REAR DRIVE SHAFT DISASSEMBLY/ASSEMBLY

- 1. Disassemble in the order indicated in the table.
- 2. Assemble in the reverse order of disassembly.



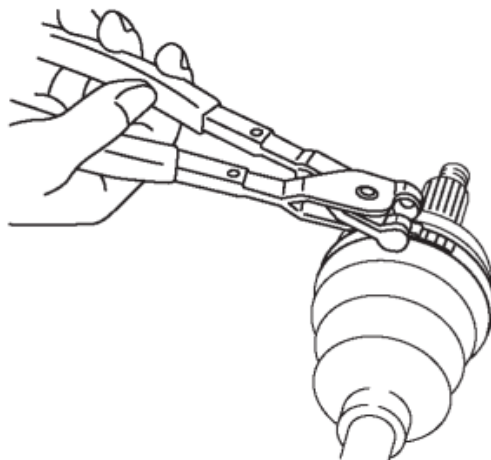
1	Boot band (axle side) (See <a href="#">Boot Band (Axle Side) Disassembly Note.</a> ) (See <a href="#">Boot Band (Axle Side) Assembly Note.</a> )
2	Boot band (differential side) (See <a href="#">Boot Band (Differential Side) Disassembly Note.</a> ) (See <a href="#">Boot Band (Differential Side) Assembly Note.</a> )
3	Tripod joint socket (See <a href="#">Tripod Joint Socket Disassembly Note.</a> ) (See <a href="#">Tripod Joint Socket Assembly Note.</a> )
4	Snap ring (See <a href="#">Snap Ring, Tripod Joint Disassembly Note.</a> ) (See <a href="#">Tripod Joint, Snap Ring Assembly Note.</a> )

5	Tripod joint (See <a href="#">Snap Ring, Tripod Joint Disassembly Note.</a> ) (See <a href="#">Tripod Joint, Snap Ring Assembly Note.</a> )
6	Boot (See <a href="#">Boot Disassembly Note.</a> ) (See <a href="#">Boot Assembly Note.</a> )
7	Shaft and ball joint component

### Boot Band (Axle Side) Disassembly Note

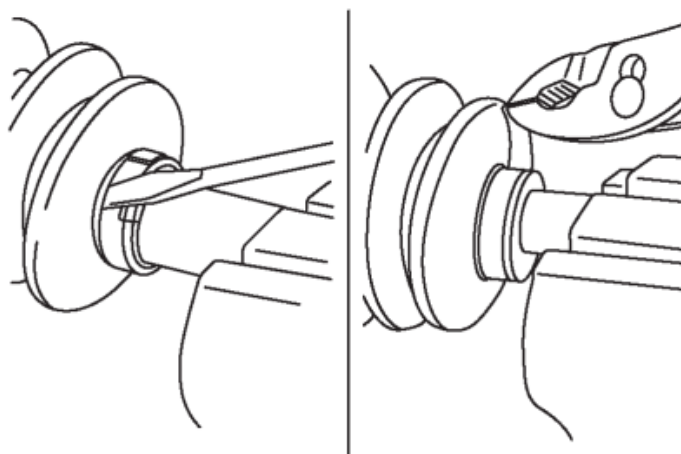
#### NOTE:

- Remove the boot band only if there is an abnormality.
1. Remove the boot band using end clamp pliers.



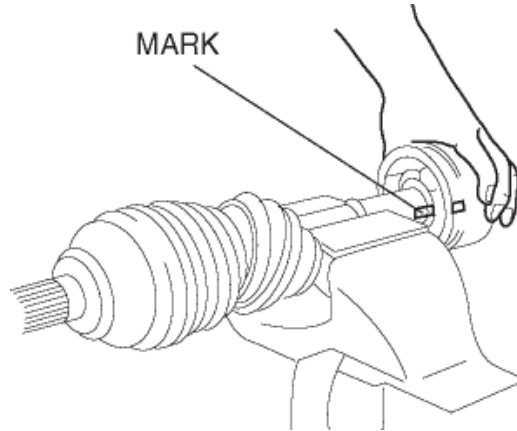
### Boot Band (Differential Side) Disassembly Note

1. Remove the crimp of the clip using a flathead screwdriver.



### Tripod Joint Socket Disassembly Note

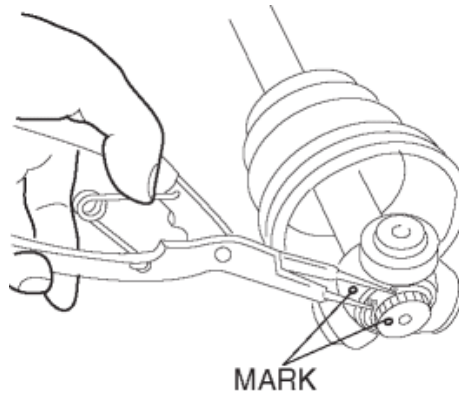
1. Place an alignment mark on the drive shaft and the outer ring.



2. Remove the outer ring.

### Snap Ring, Tripod Joint Disassembly Note

1. Place an alignment mark on the shaft and tripod joint.
2. Remove the snap ring using a snap ring plier.



3. Remove the tripod joint from the shaft.

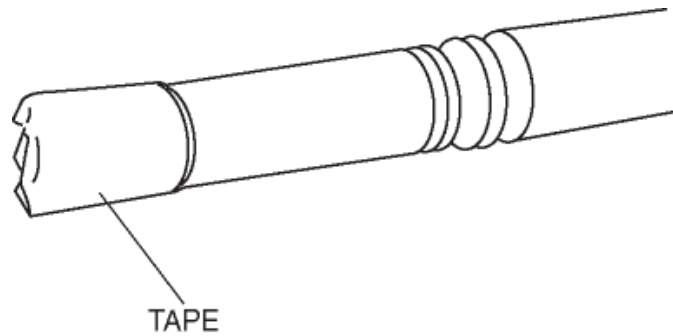
#### CAUTION:

- To prevent damage to the component, do not use a hammer when removing it.

### Boot Disassembly Note

#### NOTE:

- Remove the axle side boot only if there is an abnormality.
1. Wrap the shaft spline with vinyl tape.



2. Remove the boot.

### Boot Assembly Note

#### NOTE:

- The boot shapes on the axle side and the differential side are different so do not miss install them.

1. Fill the inside of the new dust boot (wheel side) with grease.

#### NOTE:

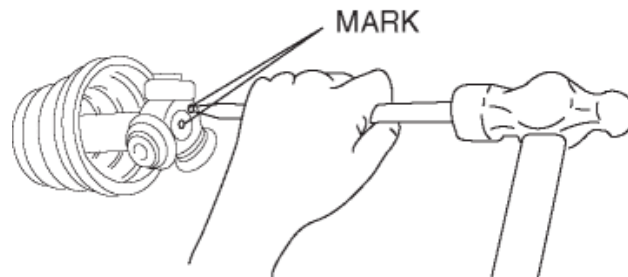
- Do not touch the grease with your hand. Apply it from the tube to prevent foreign matter from entering the boot.

#### Grease amount

- 90—110 g {3.18—3.88 oz}
2. Install the boot with the drive shaft spline still wrapped with vinyl tape.
  3. Remove the vinyl tape.

### Tripod Joint, Snap Ring Assembly Note

1. Align the tripod joint with the shaft mark and insert it using a brass bar.



#### CAUTION:

- To prevent damage to the component, do not tap the roller part when installing.
2. Install the new snap ring to the shaft installation slot securely using a snap ring pliers.

### Tripod Joint Socket Assembly Note

1. Fill the outer ring and boot (differential side) with the repair kit grease.

#### NOTE:

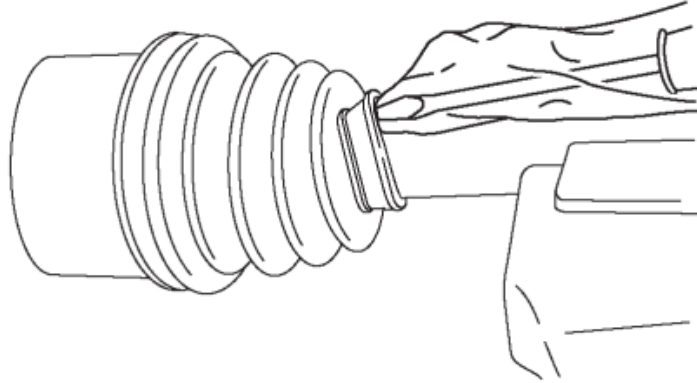
- Do not touch the grease with your hand. Apply it from the tube to prevent foreign matter from entering the boot.

### Grease amount

- 135—155 g {4.77—5.46 oz}

2. Assemble the outer ring.

3. Release any trapped air from the boots by carefully lifting up the small end of each boot with a cloth wrapped screwdriver.



### CAUTION:

- Do not let the grease leak.
- Do not damage the boot.

4. Set the drive shaft length to the specification when the inside of the boots is at ambient pressure.

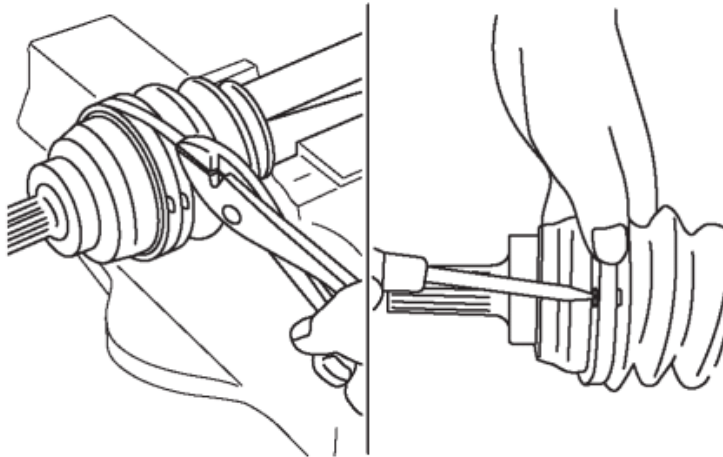
### Drive shaft length

- Left side: 778.5—788.5 mm {30.65—31.04 in}
- Right side: 818.5—828.5 mm {32.22—32.62 in}

5. After installation, verify that there is no boot damage or grease leakage.

### Boot Band (Differential Side) Assembly Note

1. Using pliers, pull the boot band around the boot slot in opposite direction of drive shaft forward rotation direction and tighten.

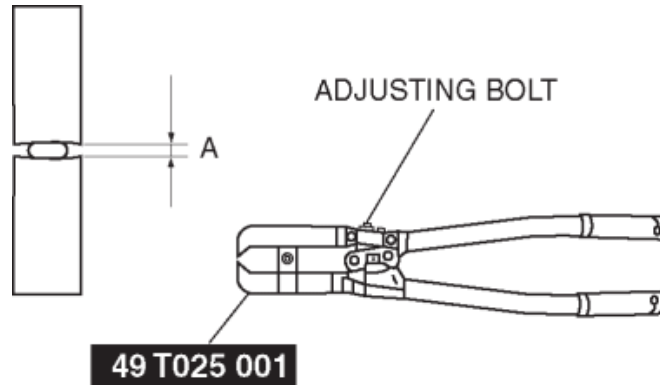


2. Insert the end of the boot band between the boot band clip and fold back the clip tabs using a flathead screwdriver to secure the boot band.

3. Verify that the boot band is installed to the boot slot securely.

## Boot Band (Axle Side) Assembly Note

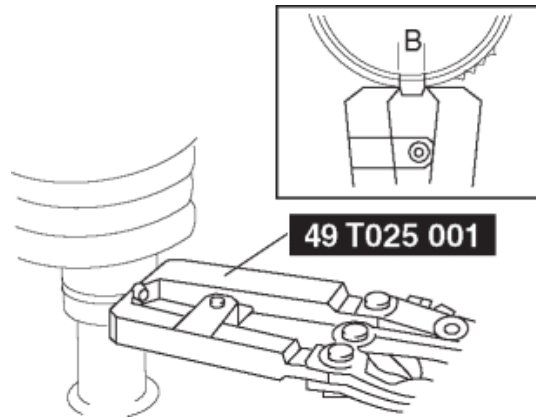
1. Turn the adjusting bolt of the **SST** and adjust the opening size to the specification A.



### Specification A

- 2.9 mm {0.11 in}

2. Crimp the boot band (small-size) using the **SST**.



3. Verify that the crimp value B is within the specification.

- If the crimp value B exceeds the specification, reduce opening length A of the **SST** and recrimp the boot band.
- If the crimp value B is less than the specification, increase opening length A of the **SST** and crimp the new boot band.

### Specification B

- 2.4—2.8 mm {0.095—0.110 in}

4. Verify that the boot band does not protrude from the boot band installation area.

- If the boot band protrudes from the installation area, replace it with a new band and repeat Step 2—4.

5. Fill the boot with the repair kit grease.

6. Adjust opening length A of the **SST** to the specification.

### Specification A

- 3.2 mm {0.13 in}

7. Crimp the boot band (large-size) using the **SST**.

8. Verify that the boot band crimp value B is within the specification.



- If crimp value B exceeds the specification, reduce opening length A of the **SST** and recrimp the boot band.
- If the crimp value B is less than the specification, replace the boot band, increase opening length A of the **SST**, and then recrimp the new boot band.

**Specification B**

- 2.4—2.8 mm {0.095—0.110 in}

9. Verify that the boot band does not protrude from the boot band installation area.

- If the boot band protrudes from the installation area, replace it with a new band and repeat Step 7—9.

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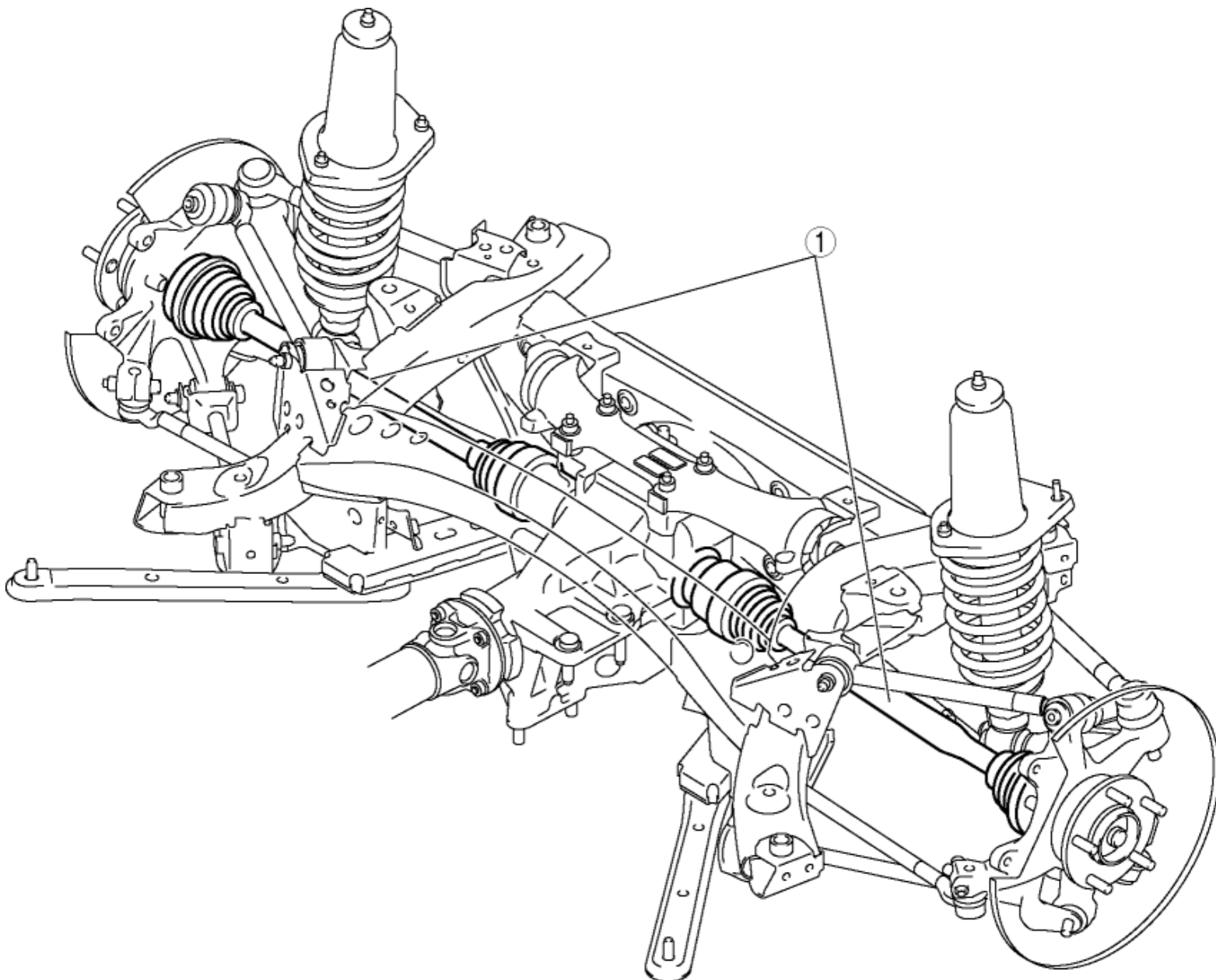
## 2008 - MX-5 - DriveLine/Axle

### REAR DRIVE SHAFT INSPECTION

1. Verify that the drive shaft is not twisted or damaged.
  - If there is any malfunction, replace the applicable part.
2. Inspect the dust boot for damage and cracks.
  - If there is any malfunction, replace the applicable part.
3. Move the spline and joint up and down, left and right by hand and verify that there is no roughness.
  - If there is any malfunction, replace the applicable part.

## 2008 - MX-5 - DriveLine/Axle

## REAR DRIVE SHAFT LOCATION INDEX



1 Rear drive shaft

(See **REAR DRIVE SHAFT INSPECTION**.)

(See **REAR DRIVE SHAFT REMOVAL/INSTALLATION**.)

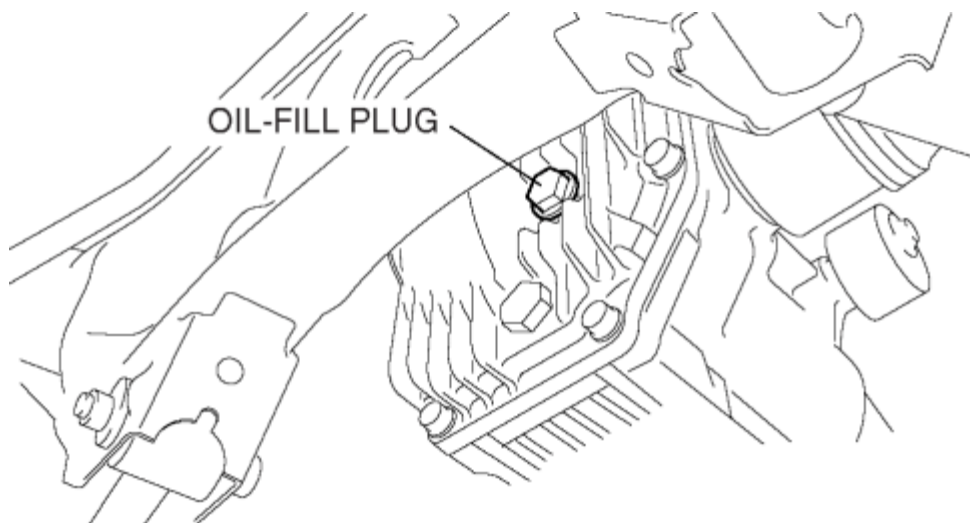
(See **REAR DRIVE SHAFT DISASSEMBLY/ASSEMBLY.**)



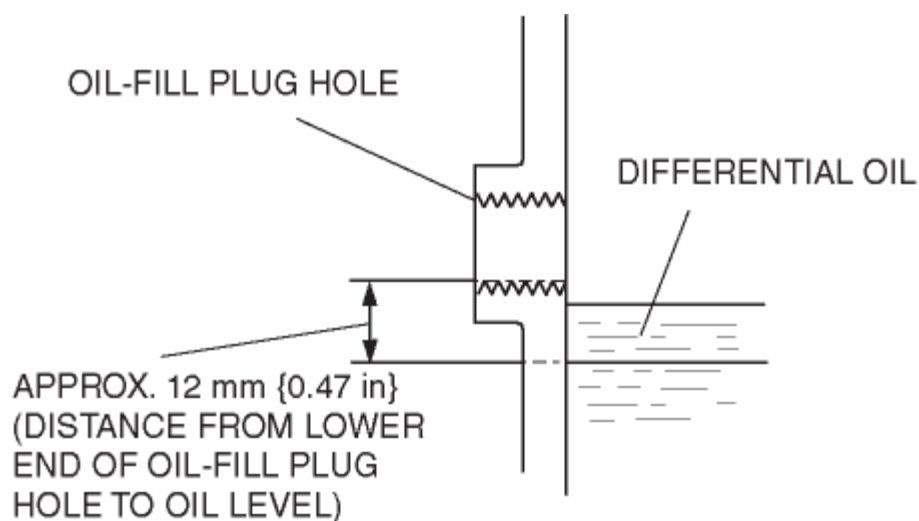
## 2008 - MX-5 - DriveLine/Axle

### DIFFERENTIAL OIL INSPECTION

1. Park the vehicle on level ground for approx. 5 min. to stabilize the differential oil.
2. Remove the oil-fill plug and the washer.



3. Inspect if the oil level is close to the rim of the oil-fill hole.



#### NOTE:

- Each vehicle is filled with a specified amount of oil ( $0.7 \pm 0.1$  L) when it is delivered, therefore, the oil level is lower than the lower end of the plug hole as shown in the figure. However, this has no effect on the differential function.

4. If the oil level is lower than approx. 12 mm {0.47 in} from the lower end of the oil-fill plug hole, inspect for oil leakage and add the specified oil.

#### Differential oil

- Grade: API service GL-5
- Viscosity: SAE 90, SAE 80W-90, SAE 75W-90 (Not available from Mazda)

5. Install the oil-fill plug with a new washer and tighten.

**Tightening torque**

- 39.2—53.9 N·m {4.00—5.49 kgf·m, 29.0—39.7 ft·lbf}

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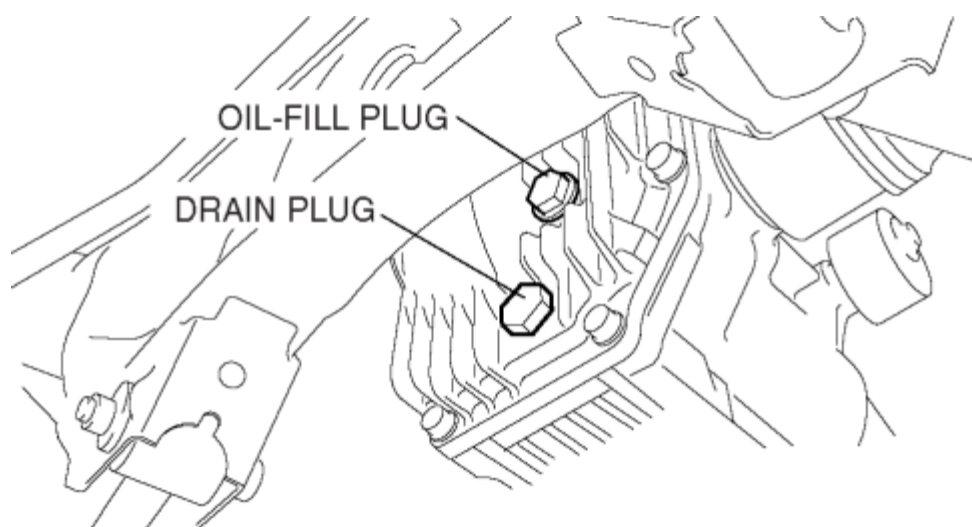
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## 2008 - MX-5 - DriveLine/Axle

### DIFFERENTIAL OIL REPLACEMENT

1. Park the vehicle on level ground.
2. Remove the oil-fill plug.
3. Remove the drain plug and drain the oil.

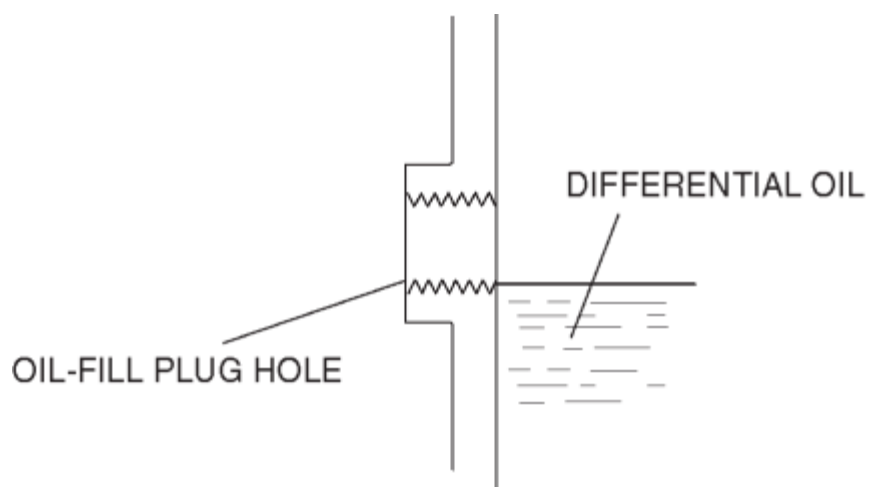


4. Install the drain plug with a new washer and tighten.

#### **Tightening torque**

- 39.2—53.9 N·m  
{ 4.00—5.49 kgf·m, 29.0—39.7 ft·lbf }

5. Add the specified oil from the oil-fill plug hole until the oil level reaches the lower end of the plug hole.



**Differential oil**

- Grade: API service GL-5
- Viscosity: SAE 90, SAE 80W-90, SAE 75W-90 (Not available from Mazda)
- Capacity (approx. quantity): 0.6—0.8 L {0.63— 0.85 US qt, 0.53—0.70 Imp qt}

6. Install the oil-fill plug with a new washer and tighten.

**Tightening torque**

- 39.2—53.9 N·m  
{ 4.00—5.49 kgf·m, 29.0—39.7 ft·lbf }

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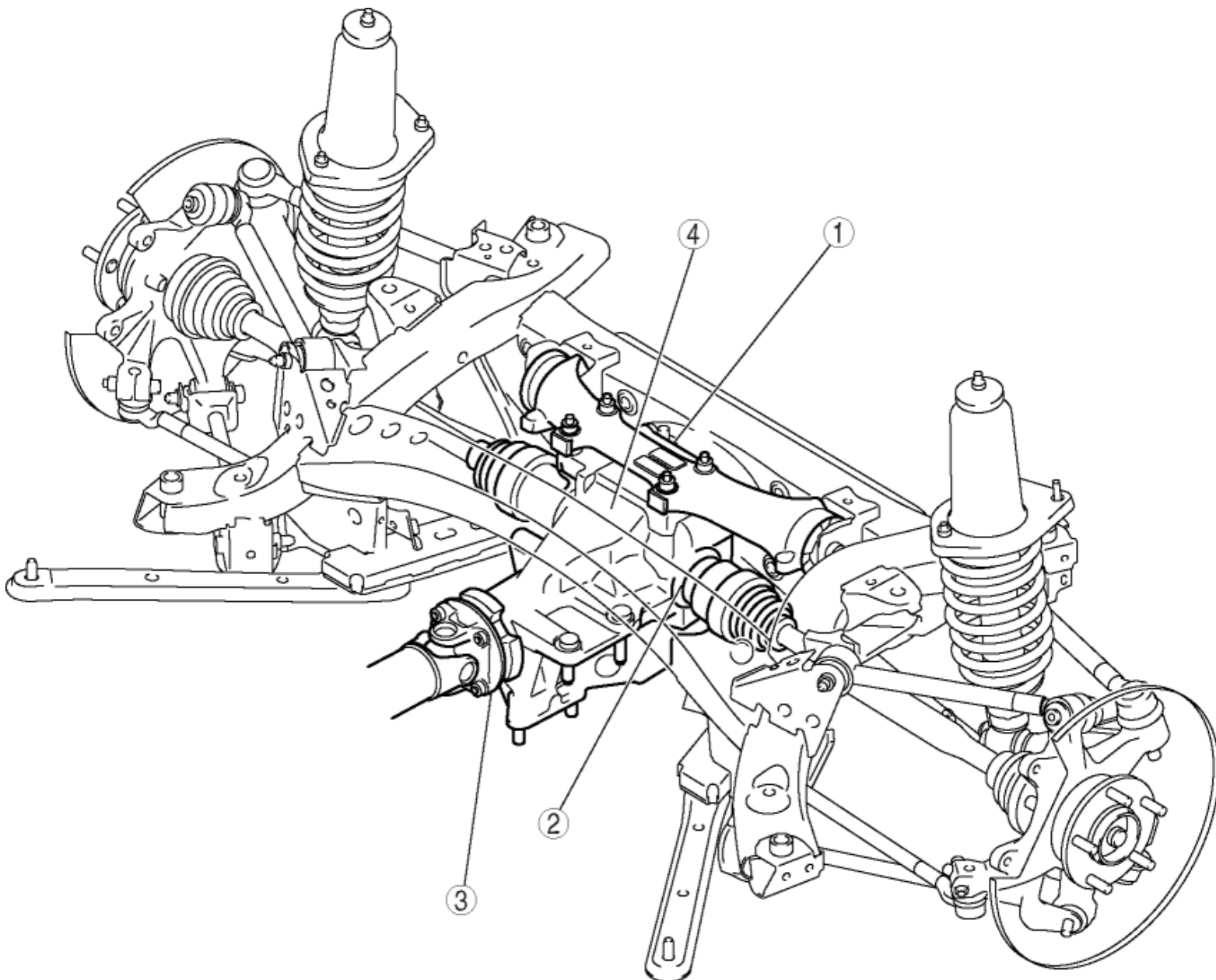
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## 2008 - MX-5 - DriveLine/Axle

### REAR DIFFERENTIAL LOCATION INDEX



1 Differential oil, oil-fill plug and drain plug

(See [DIFFERENTIAL OIL INSPECTION.](#))

(See [DIFFERENTIAL OIL REPLACEMENT.](#))

2 Oil seal (side gear)

	(See <a href="#">OIL SEAL (SIDE GEAR) REPLACEMENT</a> .)
3	Oil seal (companion flange) (See <a href="#">OIL SEAL (COMPANION FLANGE) REPLACEMENT</a> .)
4	Rear differential (See <a href="#">REAR DIFFERENTIAL REMOVAL/INSTALLATION</a> .) (See <a href="#">REAR DIFFERENTIAL DISASSEMBLY</a> .) (See <a href="#">REAR DIFFERENTIAL ASSEMBLY</a> .)

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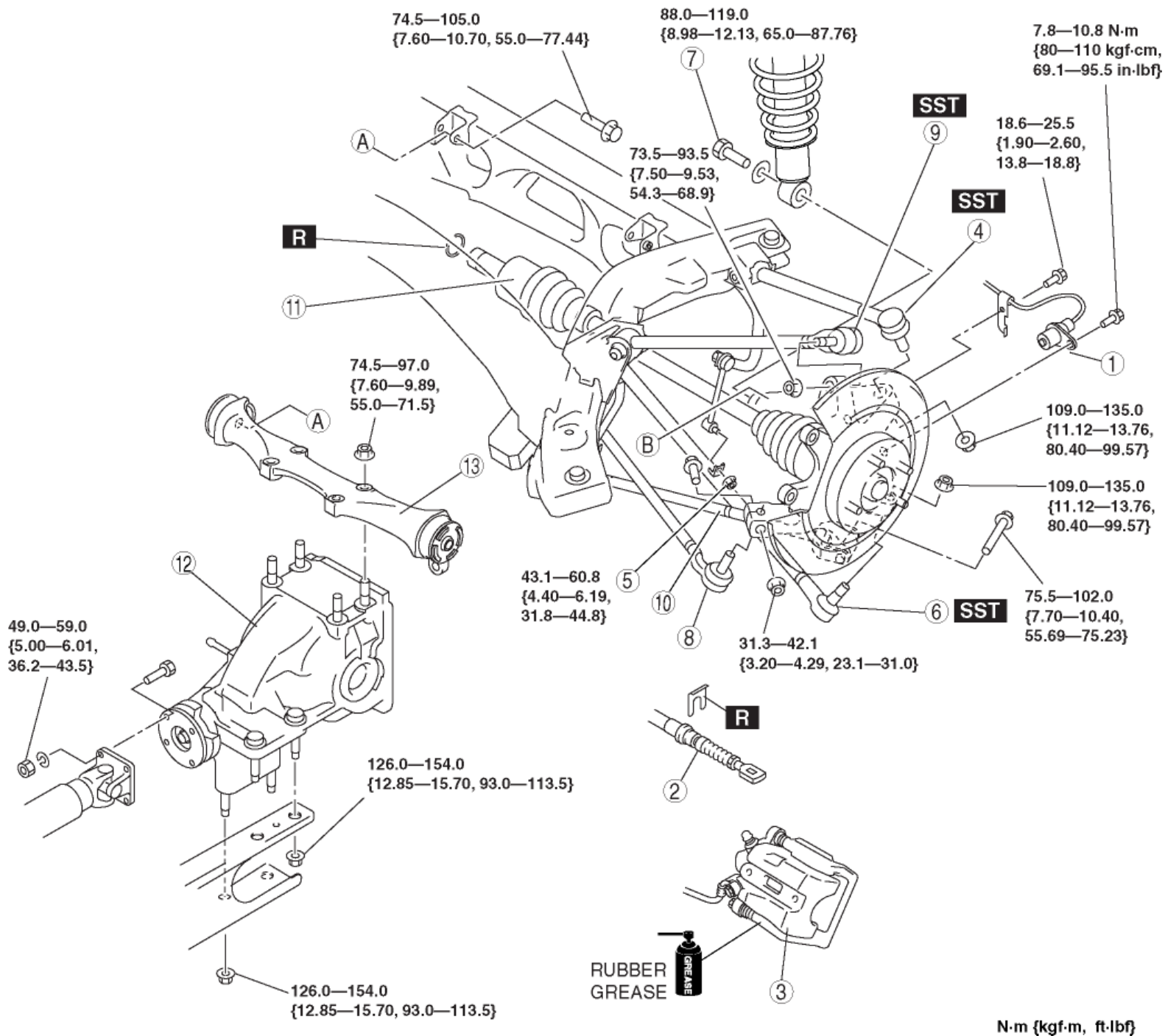
## 2008 - MX-5 - DriveLine/Axle

### REAR DIFFERENTIAL REMOVAL/INSTALLATION

#### CAUTION:

- Performing the following procedures without first removing the ABS wheel-speed sensor may possibly cause an open circuit in the wiring harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel-speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.

1. Drain the rear differential oil.
2. Remove the middle pipe. (See [EXHAUST SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the propeller shaft. (See [PROPELLER SHAFT REMOVAL/INSTALLATION](#).)
4. Remove the power plant frame. (See [TRANSMISSION REMOVAL/INSTALLATION\[M15M-D\]](#).) (See [TRANSMISSION REMOVAL/INSTALLATION\[P66M-D\]](#).)
5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.
7. Add rear differential oil. (See [DIFFERENTIAL OIL REPLACEMENT](#).)

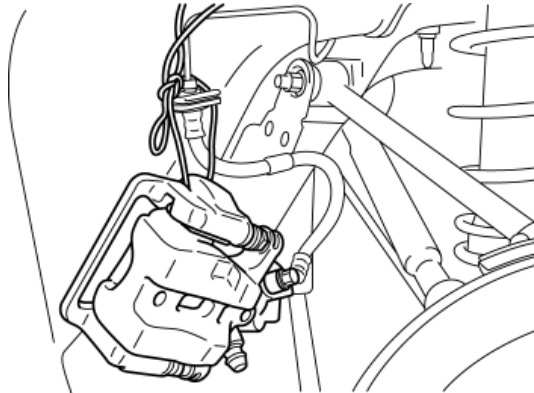


1	ABS wheel-speed sensor
2	Parking brake cable
3	Brake caliper component (See <a href="#">Brake Caliper Component Removal Note.</a> )
4	Rear lateral link (upper) ball joint (See <a href="#">REAR LATERAL LINK (UPPER) REMOVAL/INSTALLATION.</a> )
5	Stabilizer control link (lower) (See <a href="#">REAR STABILIZER REMOVAL/INSTALLATION.</a> )

6	Rear lateral link (lower) ball joint (See <a href="#">REAR LATERAL LINK (LOWER) REMOVAL/INSTALLATION.</a> )
7	Shock absorber bolt (lower)
8	Toe control link ball joint
9	Rear trailing link (upper) ball joint (See <a href="#">REAR LATERAL LINK (UPPER) REMOVAL/INSTALLATION.</a> )
10	Rear trailing link (lower) bolt (outer side)
11	Rear drive shaft, rear knuckle component (See <a href="#">Rear Drive Shaft, Rear Knuckle Component Removal Note.</a> ) (See <a href="#">Rear Drive Shaft, Rear Knuckle Component Installation Note.</a> )
12	Rear differential (See <a href="#">Rear Differential Removal/Installation Note.</a> )
13	Differential mount

#### Brake Caliper Component Removal Note

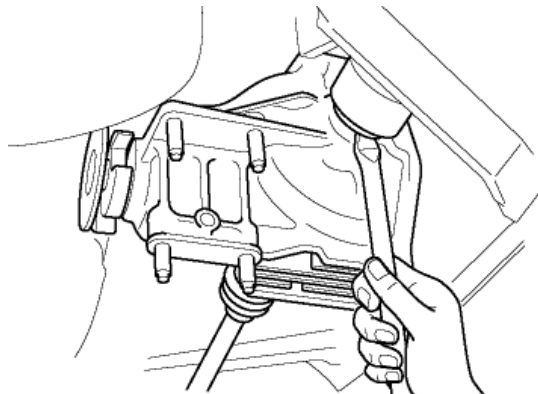
1. Suspend the brake caliper component using a cable or equivalent.



2. Temporarily tighten the wheel nut to prevent the disc plate from falling off.

#### Rear Drive Shaft, Rear Knuckle Component Removal Note

1. Insert a tire lever or equivalent between the rear differential and differential side outer ring, and remove the rear drive shaft.

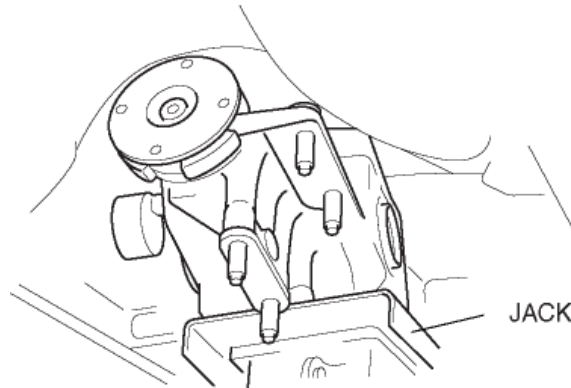


**CAUTION:**

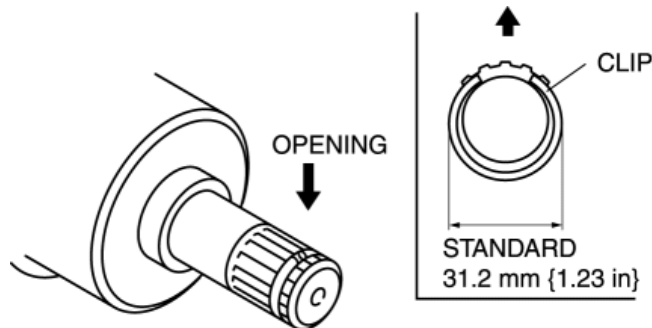
- The sharp edges of the drive shaft can slice or puncture the oil seal. Be careful not to damage the oil seal when removing the drive shaft from the differential.
2. Pull the rear drive shaft and rear knuckle component to the outer side, and detach the rear drive shaft from the rear differential.
  3. To hold the rear drive shaft and rear knuckle component, install the rear lateral link (upper) to the rear knuckle temporarily after disconnecting the rear drive shaft.

**Rear Differential Removal/Installation Note****WARNING:**

- If the rear differential falls off, it can cause serious injuries or death, and damage to the vehicle. When removing/installing the rear differential, verify that it is supported securely with a jack.
1. Remove or install the rear differential, while supporting it securely with a jack, and moving the jack gradually.

**Rear Drive Shaft, Rear Knuckle Component Installation Note**

1. Install a new drive shaft clip to the clip groove at the top of the rear drive shaft with the clip opening facing upward and the clip width within the specification.

**Standard**

- 31.2 mm {1.23 in}
2. After installing the clip, measure the outer diameter if it exceeds the specification, reinstall a new clip.
  3. Apply differential oil to the differential oil seal lip.

**CAUTION:**

- The sharp edges of the rear drive shaft can slice or puncture the oil seal. Be careful not to damage the oil seal when installing the rear drive shaft from the rear differential.
4. Insert the rear drive shaft into the rear differential with the clip opening facing upward.
  5. After installation, verify that the rear drive shaft is securely held by the clip by pulling the outer ring on the differential side towards the axle.



**WARNING:**

- The engine stand is equipped with a self-lock mechanism, however, if the rear differential is tilted, the self-lock mechanism could become inoperative. If the rear differential unexpectedly rotates, it could cause injury, therefore do not maintain the rear differential tilted. When turning the rear differential, grasp the rotation handle firmly.

1. Disassemble in the order indicated in the table.



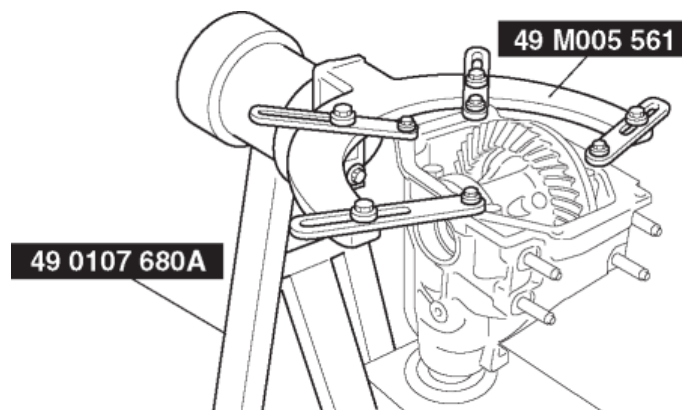


1	Breather plug
2	Rear cover
3	Baffle plate
4	Differential component (See <a href="#">Differential Component Disassembly Note.</a> )
5	Bearing cap (See <a href="#">Bearing Cap Disassembly Note.</a> )
6	Adjustment shim (See <a href="#">Adjustment Shim, Side Bearing Outer Race Disassembly Note.</a> )
7	Differential gear case component
8	Side bearing outer race (See <a href="#">Adjustment Shim, Side Bearing Outer Race Disassembly Note.</a> )
9	Side bearing (See <a href="#">Side Bearing Disassembly Note.</a> )
10	Ring gear
11	Gear case
12	Roll pin (See <a href="#">Roll Pin Disassembly Note.</a> )
13	Pinion shaft
14	Pinion gear
15	Thrust washer
16	Side gear
17	Washer
18	Locknut (See <a href="#">Locknut Disassembly Note.</a> )
19	Washer
20	Companion flange (See <a href="#">Companion Flange Disassembly Note.</a> )
21	Oil seal (companion flange)
22	Spacer
23	Front bearing
24	Drive pinion component

	(See <a href="#">Drive Pinion Component Disassembly Note.</a> )
25	Collapsible spacer
26	Rear bearing (See <a href="#">Rear Bearing Disassembly Note.</a> )
27	Spacer
28	Drive pinion
29	Front bearing outer race (See <a href="#">Front Bearing Outer Race, Rear Bearing Outer Race Disassembly Note.</a> )
30	Rear bearing outer race (See <a href="#">Front Bearing Outer Race, Rear Bearing Outer Race Disassembly Note.</a> )
31	Oil seal (side gear)
32	Differential carrier
33	Oil-fill plug
34	Drain plug

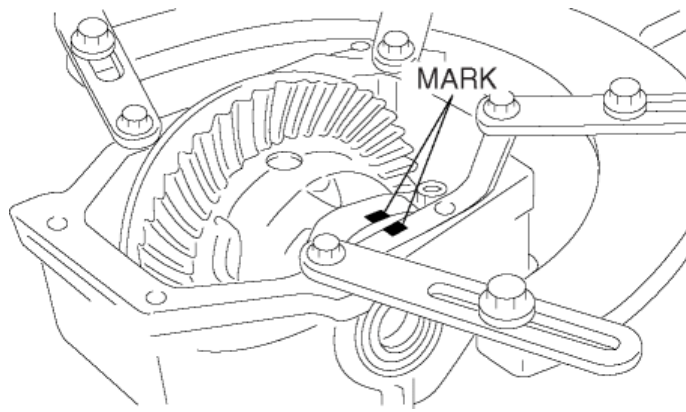
### Differential Component Disassembly Note

1. Install the differential component to the **SSTs**.



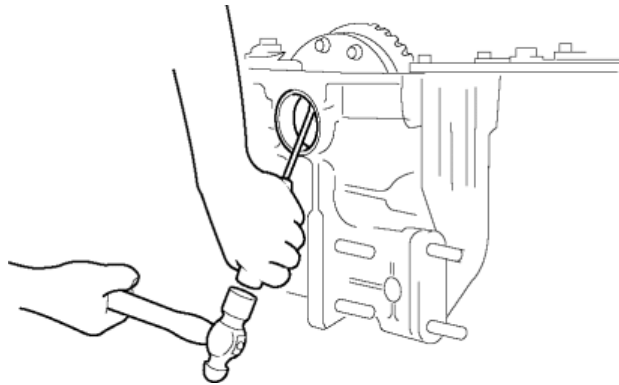
### Bearing Cap Disassembly Note

1. Mark the bearing cap and differential carrier for proper installation.

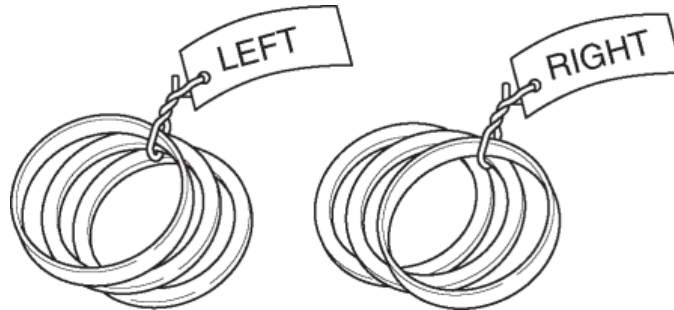


### Adjustment Shim, Side Bearing Outer Race Disassembly Note

1. Remove the adjustment shim using a flathead screwdriver.

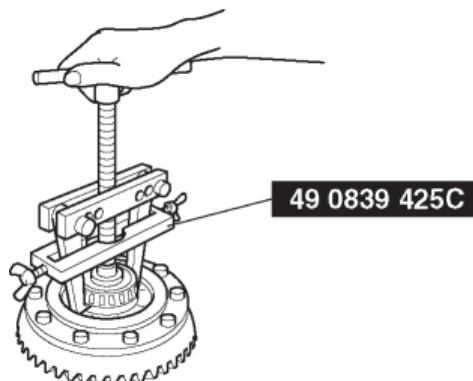


2. Put left and right identification marks on the removed adjustment shims and side bearing outer races.



### Side Bearing Disassembly Note

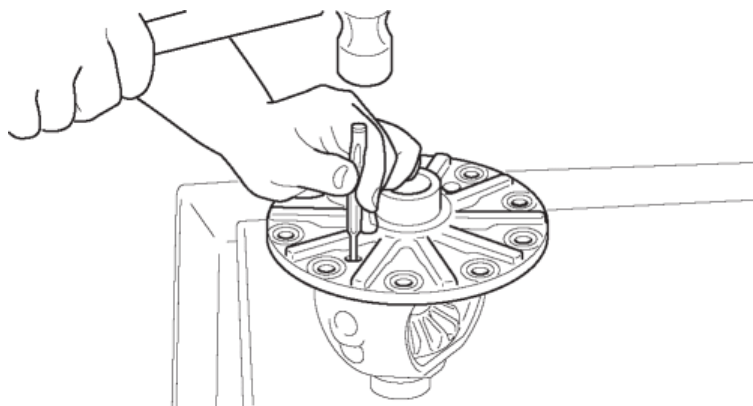
1. Remove the side bearing using the SST.



2. Put left and right identification marks on the removed side bearings.

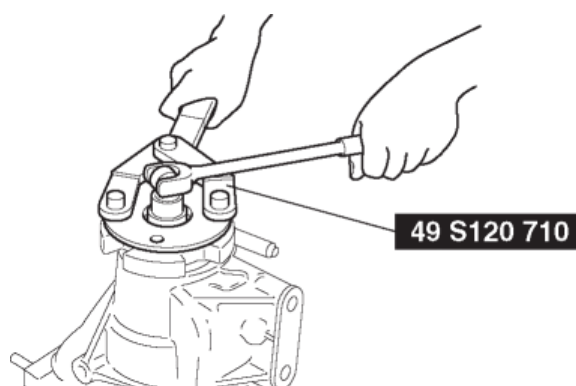
### Roll Pin Disassembly Note

1. Tap the roll pin out from the direction shown in the figure using a pin punch.



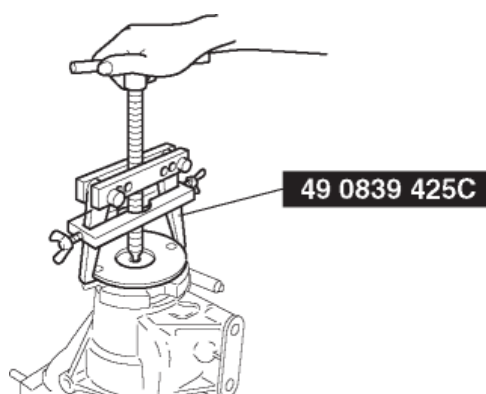
### Locknut Disassembly Note

1. Remove the locknut while fixing the companion flange using the **SST**.



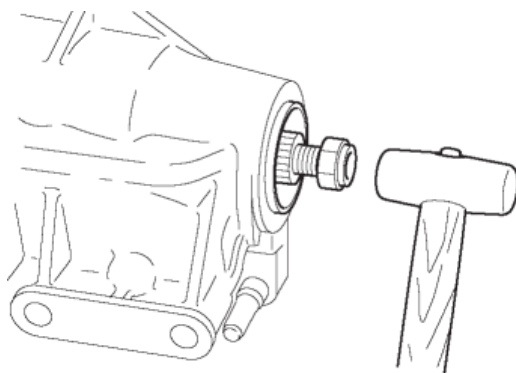
### Companion Flange Disassembly Note

1. Remove the companion flange using the **SST**.



### Drive Pinion Component Disassembly Note

1. Install the removed locknut to the drive pinion top to prevent damage to the thread.

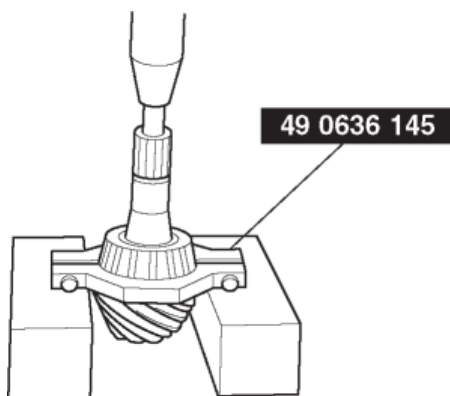


2. Remove the drive pinion component by tapping the locknut lightly using a plastic hammer.
3. Remove the locknut installed in Step 1.

### Rear Bearing Disassembly Note

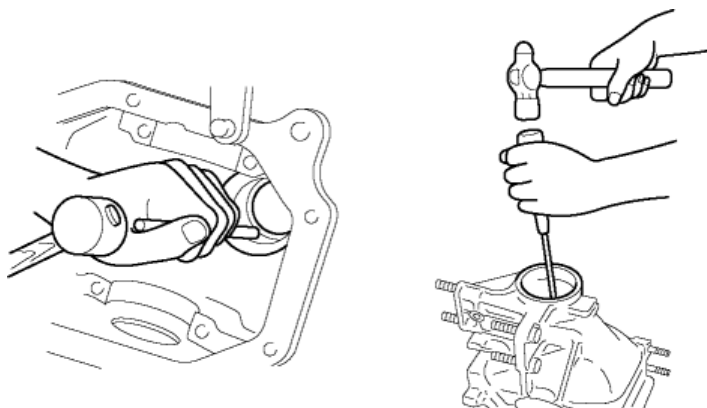
#### CAUTION:

- The drive pinion could be damaged if it falls off. Support the drive pinion with your hand when removing the rear bearing.
1. Remove the rear bearing using the **SST** and a press.



### Front Bearing Outer Race, Rear Bearing Outer Race Disassembly Note

1. Remove the bearing outer race by lightly tapping the edge of the bearing outer race using a flathead screwdriver.



## 2008 - MX-5 - DriveLine/Axle

### REAR DIFFERENTIAL ASSEMBLY

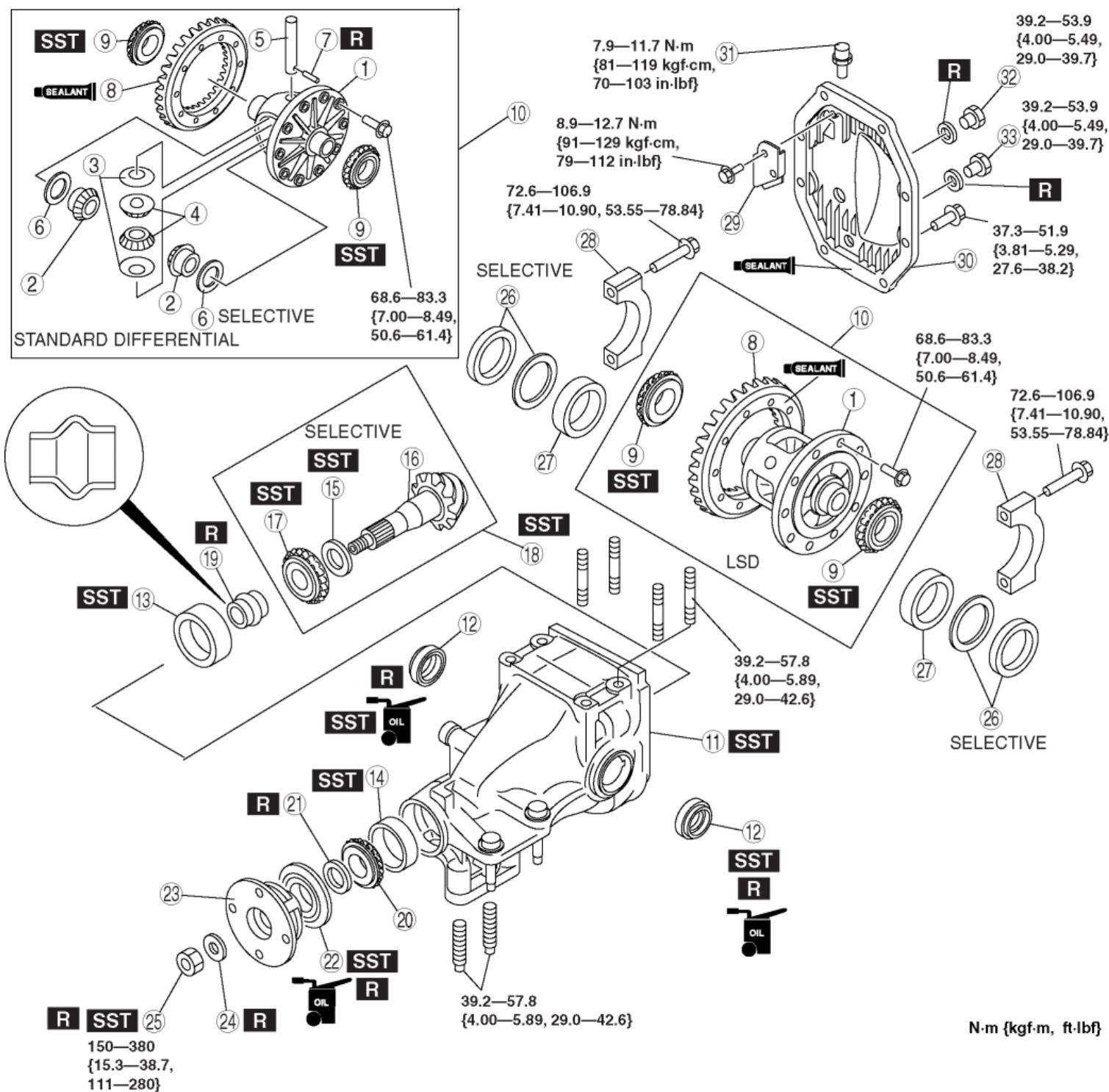
#### WARNING:

- The engine stand is equipped with a self-lock mechanism, however, if the rear differential is tilted, the self-lock mechanism could become inoperative. If the rear differential unexpectedly rotates, it could cause injury, therefore do not maintain the rear differential tilted. When turning the rear differential, grasp the rotation handle firmly.

#### NOTE:

- Clean away the old silicone sealant before applying the new silicone sealant.
- Install the rear cover **within 10 min** after applying the silicone sealant.
- Allow the sealant to set **at least 30 min or more** after installation before filling the differential with differential oil.

1. Assemble in the order indicated in the table.



1	Gear case
2	Side gear
3	Thrust washer
4	Pinion gear
5	Pinion shaft
6	Washer

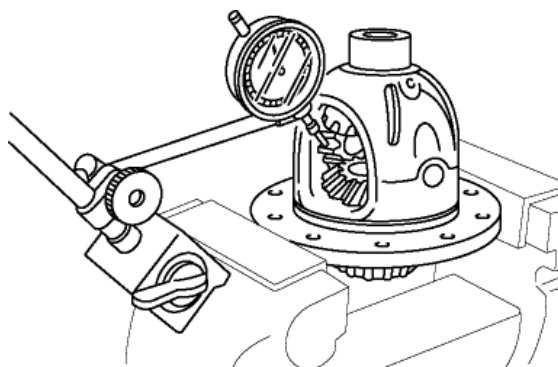
	(See <a href="#">Washer Assembly Note.</a> )
7	Roll pin (See <a href="#">Roll Pin Assembly Note.</a> )
8	Ring gear (See <a href="#">Ring Gear Assembly Note.</a> )
9	Side bearing (See <a href="#">Side Bearing Assembly Note.</a> )
10	Differential gear case component
11	Differential carrier
12	Oil seal (side gear) (See <a href="#">Oil Seal (Side Gear) Assembly Note.</a> )
13	Rear bearing outer race (See <a href="#">Rear Bearing Outer Race Assembly Note.</a> )
14	Front bearing outer race (See <a href="#">Front Bearing Outer Race Assembly Note.</a> )
15	Spacer (See <a href="#">Spacer Assembly Note.</a> )
16	Drive pinion
17	Rear bearing (See <a href="#">Rear Bearing Assembly Note.</a> )
18	Drive pinion component (See <a href="#">Drive Pinion Component Assembly Note.</a> )
19	Collapsible spacer
20	Front bearing
21	Spacer
22	Oil seal (companion flange) (See <a href="#">Oil Seal (Companion Flange) Assembly Note.</a> )
23	Companion flange
24	Washer
25	Locknut (See <a href="#">Locknut Assembly Note.</a> )
26	Adjustment shim (See <a href="#">Adjustment Shim Assembly Note.</a> )
27	Side bearing race



28	Bearing cap (See <a href="#">Bearing Cap Assembly Note</a> .)
29	Baffle plate
30	Rear cover
31	Breather plug
32	Oil-level plug
33	Drain plug

### Washer Assembly Note

1. Assemble the side gear, thrust washer, pinion gear, and the pinion shaft to the gear case.
2. Install the dial gauge with the measuring probe of the dial gauge attached perpendicularly to the end of one of the pinion gear teeth.



3. Fix either one of the side gears.
4. Move the pinion gear and measure the backlash at the pinion gear top.
  - If it is not within the specification, adjust by choosing the proper washer.

#### Backlash of pinion gear and side gear

- 0.1 mm {0.004 in} or less

### Washer table

Identification mark	Part name	Thickness (mm {in})
9	MA29 27 252	0.90 {0.0354}
95	MA29 27 253	0.95 {0.0374}
0	MA29 27 254	1.00 {0.0393}
05	MA29 27 256	1.05 {0.0413}
1	MA29 27 257	1.10 {0.0433}

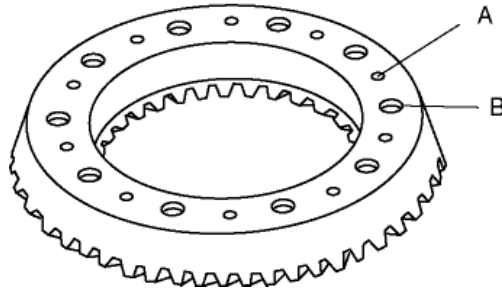
### Roll Pin Assembly Note

1. Align the differential gear case and pinion shaft pin holes.
2. Tap the roll pin in using a pin punch.

## Ring Gear Assembly Note

### CAUTION:

- The gear case and ring gear could be damaged if the ring gear is installed with old thread-locking compound remaining on the bolt threads. Before installing the ring gear, completely remove the old thread-locking compound from the bolt threads.
1. Apply a small amount of thread-locking compound to each of points A on the back of the ring gear, and bolt thread areas B (around the entire ring).



### Application thickness

- Back of ring gear points A:  
Approx.  $0.4 \text{ cm}^3$  {0.4 cc, 0.024 cu in}  
(1 location approx.  $0.04 \text{ cm}^3$  {0.04 cc, 0.0024 cu in})
  - Ring gear bolt thread points B:  
Approx.  $0.4 \text{ cm}^3$  {0.4 cc, 0.024 cu in}  
(1 location approx.  $0.04 \text{ cm}^3$  {0.04 cc, 0.0024 cu in})
2. Install the ring gear to the differential gear case and tighten the bolts in a criss-cross pattern.

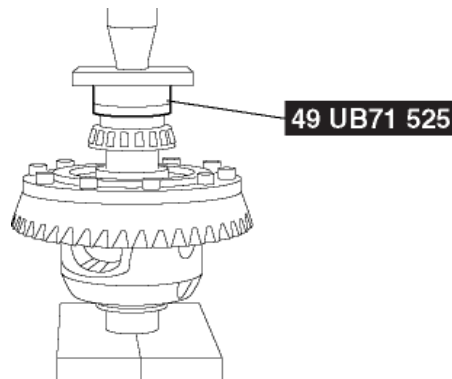
### Tightening torque

- 68.6—83.3 N·m  
{ 7.00—8.49 kgf·m, 50.6—61.4 ft·lbf }

## Side Bearing Assembly Note

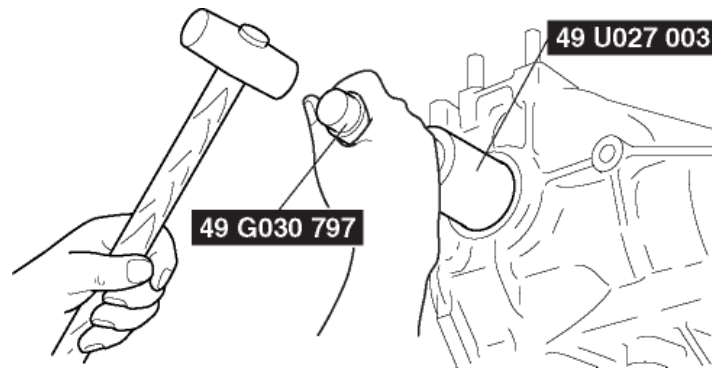
### NOTE:

- When assembling the side bearings, do not mix the left and right side bearings that were identified during disassembly.
1. Press the side bearing in using the **SST** and a press.



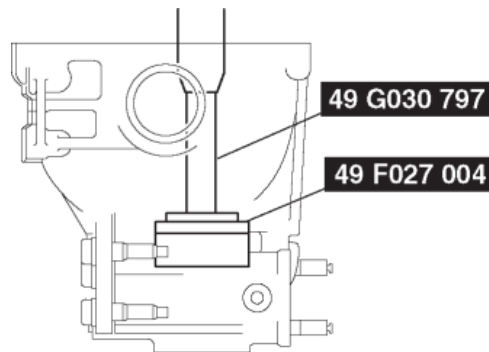
## Oil Seal (Side Gear) Assembly Note

1. Apply differential oil to the lip of a new oil seal.
2. Assemble the oil seal using the **SSTs**.



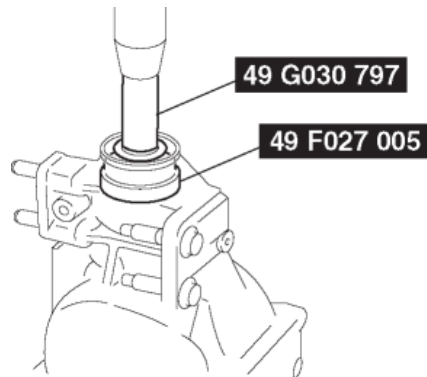
#### Rear Bearing Outer Race Assembly Note

1. Press the rear bearing outer race into the differential carrier using the **SST** and a press.



#### Front Bearing Outer Race Assembly Note

1. Press the front bearing outer race into the differential carrier using the **SST** and a press.

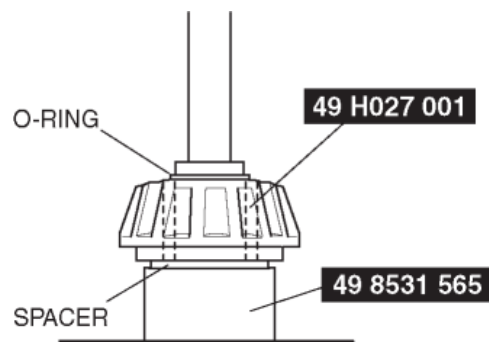


#### Spacer Assembly Note

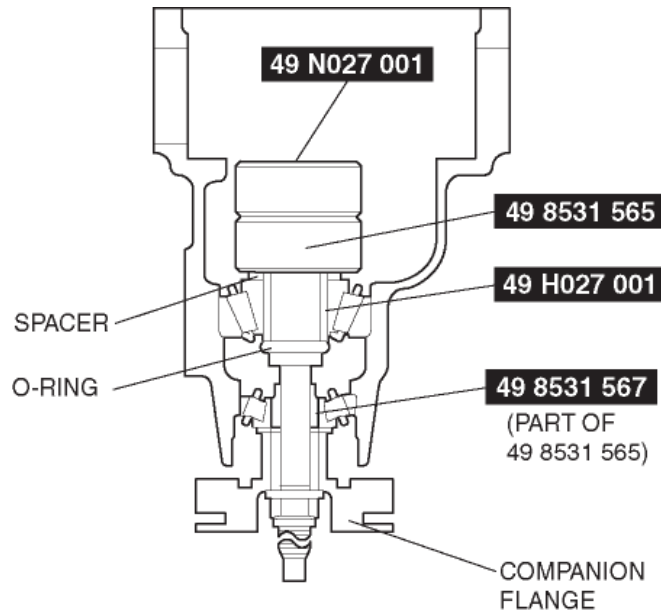
##### Pinion height adjustment

#### NOTE:

- Use the installed spacer when adjusting.
  - Install the spacer with the chamfer on the **SST** side.
1. Assemble the spacer, bearing inner race (rear side), and the **SST** (O-ring) to the **SST** (49 8531 565) as shown in the figure.



2. Insert the set assembled in Step 1 from the rear side of the differential carrier.

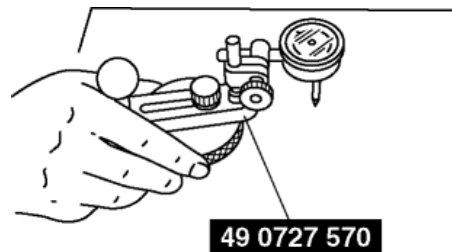


3. Assemble the **SST** (49 8531 567), front bearing, companion flange, and a washer from the front side of the differential carrier.

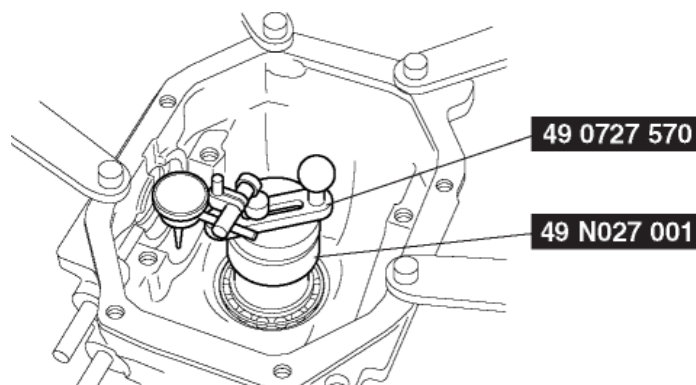
4. Tighten the locknut to the extent that the **SST** (49 8531 565) can be turned by hand.

5. Place the **SST** (49 N027 001) on top of the **SST** (49 8531 565).

6. Place the **SST** on the surface plate and set the dial gauge to zero.

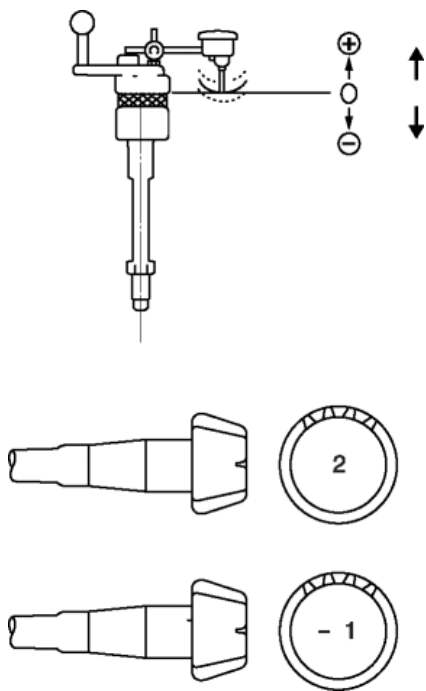


7. Set the **SSTs** as shown in the figure.



8. Place the measuring probe of the dial gauge at the point where the side bearing is installed in the differential carrier and measure at the lowest position. Measure the left and right sides.

9. Add the two (left and right) values obtained by the measurements taken in Step 8 and then divide the total by **2**. From this sum, subtract the sum of the number inscribed on the end of the drive pinion divided by **100**. (If there is no figure inscribed, use 0.) This is the pinion height adjustment value.



**Differential pinion height**

- 0.038 mm {0.0015 in} or less

**NOTE:**

- When the values obtained by the measurements taken in Step 8, 9 are 0.06 mm {0.0024 in}, 0.04 mm {0.0016 in} and the tip surface of the drive pinion value is 2, the formula is  $((0.06+0.04)/2)-(2/100)=0.03$ . Therefore, assemble a spacer 0.03 mm {0.0012} thicker than the currently assembled one. The thickness settings are in increments of 0.015 mm {0.0006}, so choose one closest in thickness and install.

**Spacer table**

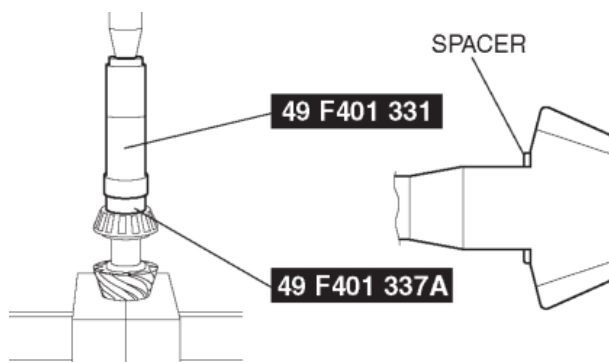
Identification mark	Thickness (mm {in})	Identification mark	Thickness (mm {in})
08	3.080 {0.1213}	29	3.290 {0.1295}
09	3.095 {0.1220}	30	3.305 {0.1301}
11	3.110 {0.1224}	32	3.320 {0.1307}
12	3.125 {0.1230}	33	3.335 {0.1313}
14	3.140 {0.1234}	35	3.350 {0.1319}
15	3.155 {0.1242}	36	3.365 {0.1325}
17	3.170 {0.1248}	38	3.380 {0.1331}
18	3.185 {0.1254}	39	3.395 {0.1337}
20	3.200 {0.1260}	41	3.410 {0.1343}
21	3.215 {0.1266}	42	3.425 {0.1348}
23	3.230 {0.1271}	44	3.440 {0.1354}
24	3.245 {0.1278}	45	3.455 {0.1360}

26	3.260 {0.1283}	47	3.470 {0.1366}
27	3.275 {0.1289}	—	—

## Rear Bearing Assembly Note

### NOTE:

- Install the spacer with the chamfer on the gear side.
1. Assemble the spacer selected in the pinion height adjustment to the drive pinion.
  2. Press the drive pinion into the rear bearing using the **SSTs** and a press.



## Drive Pinion Component Assembly Note

### Drive pinion preload adjustment

### NOTE:

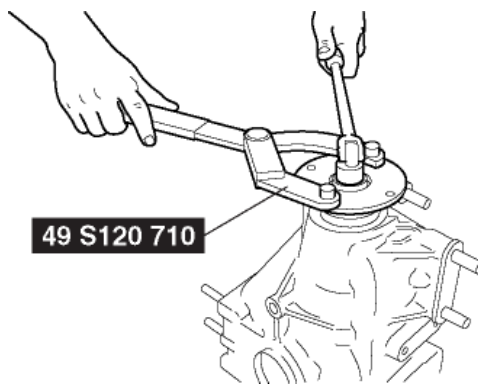
- Perform preload adjustment with the oil seal uninstalled.
1. Assemble the following parts to the drive pinion.
    - New collapsible spacer
    - Front bearing
    - New spacer
    - Companion flange
    - New washer
    - New locknut
  2. Turn the serrated part of the drive pinion by hand to seat the bearing.
  3. Tighten the locknut temporarily tightened in Step 1 from the lower limit of the specified tightening torque using the **SST**, and obtain the specified preload. Record the tightening torque at this time.

### Tightening torque

- 150—380 N·m { 15.3—38.7 kgf·m, 111—280 ft·lbf }

### Drive pinion preload

- 1.3—1.8 N·m { 14—18 kgf·cm, 12—15 in·lbf }

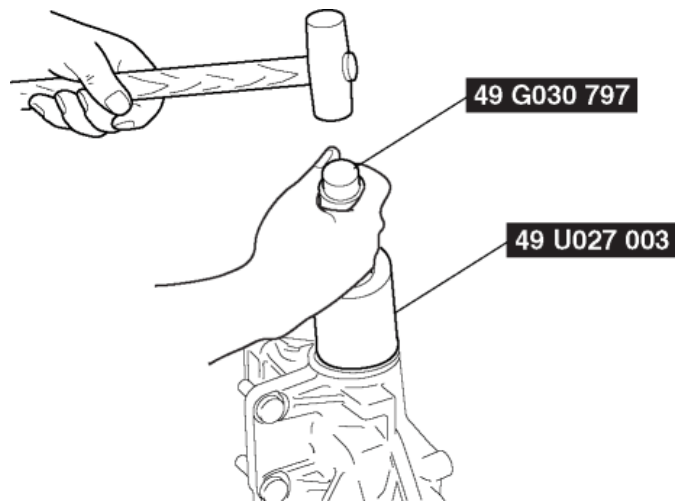


- If the specified preload cannot be obtained within the specified tightening torque, replace with a new collapsible spacer and adjust again.

4. Remove the locknut, washer, and companion flange.

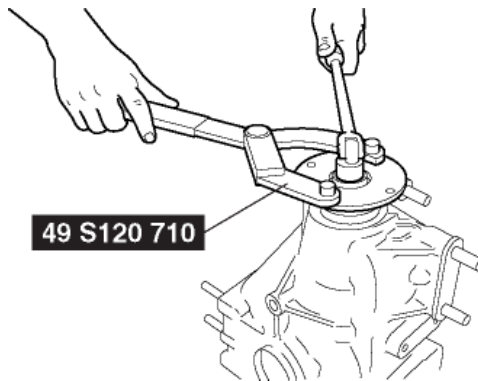
#### Oil Seal (Companion Flange) Assembly Note

1. Apply differential oil to the lip of a new oil seal.
2. Assemble the oil seal using the **SST**.

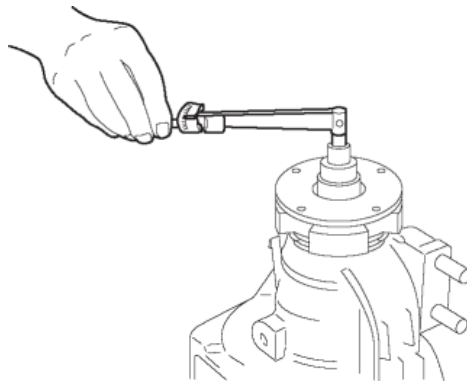


#### Locknut Assembly Note

1. Tighten a new locknut with the torque recorded at the drive pinion preload adjustment using the **SST**.



2. Verify that the drive pinion preload is within the specification.



- If not within the specification, perform the preload adjustment again.

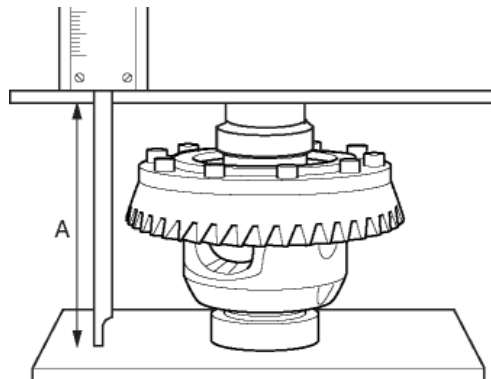
#### Drive pinion preload

- 1.3—1.8 N·m {14—18 kgf·cm, 12—15 in·lbf}

### Adjustment Shim Assembly Note

#### Ring gear backlash adjustment

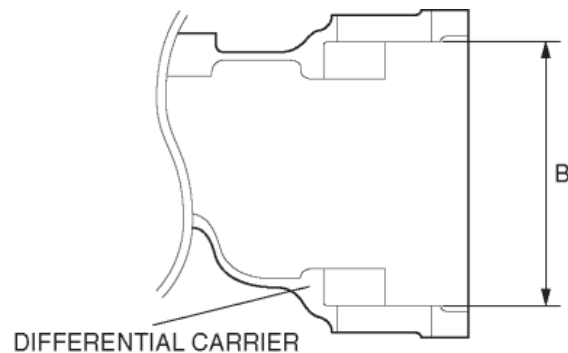
1. Stack the side bearing race and differential gear case component on the surface plate as shown in the figure, and measure the height using a caliper and a ruler. This is value A.



#### Standard Height A

- 151.4—152.6 mm {5.961—6.007 in}

2. Measure the width of the section of the differential gear case component installed in the differential carrier. This is value B.



#### Standard width B

- 171 mm {6.73 in}

1. The combined thickness of the left and right adjustment shims is obtained by the following formula.

$$\text{Shim thickness (mm \{in\})} = B - A + (0.01 - 0.03 \{0.0004 - 0.0118 \text{ in}\})$$

2. If the combined thickness of the previously assembled adjustment shims is equal to the calculated thickness, use the shims as they are.
3. If the combined thickness of the previously assembled adjustment shims is not equal to the calculated thickness, or if the adjustment shims have to be replaced, select two appropriate adjustment shims from the table below. **Adjustment shim table**



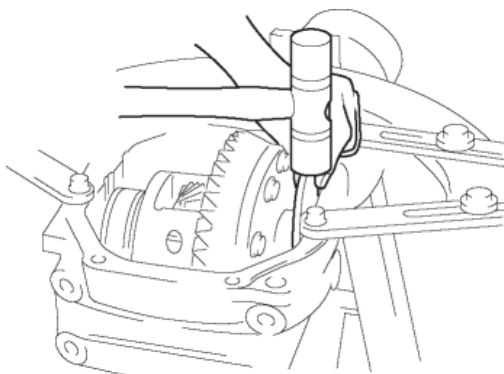
Identification mark	Thickness (mm {in})	Identification mark	Thickness (mm {in})
550	5.50 {0.217}	605	6.05 {0.238}
560	5.60 {0.220}	610	6.10 {0.240}
565	5.65 {0.222}	615	6.15 {0.242}
570	5.70 {0.224}	620	6.20 {0.244}
575	5.75 {0.226}	625	6.25 {0.246}
580	5.80 {0.228}	630	6.30 {0.248}
585	5.85 {0.230}	635	6.35 {0.250}
590	5.90 {0.232}	640	6.40 {0.252}
595	5.95 {0.234}	650	6.50 {0.256}
600	6.00 {0.236}	—	—

**NOTE:**

- If the adjustment shims are to be reused, assemble the left and right shims that were identified during disassembly.
- When assembling the side bearing races, do not mix the left and right side bearings that were identified during disassembly.

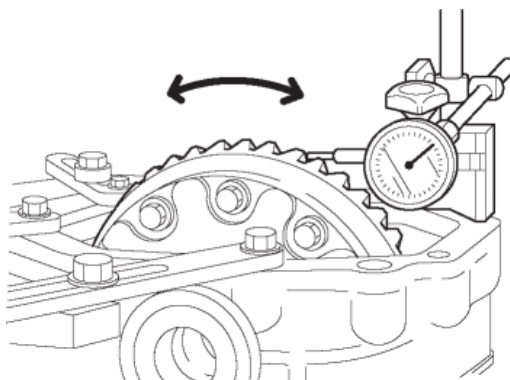
4. Assemble the differential gear case component and the side bearing race to the differential carrier.

5. Tap the selected adjustment shim between the differential carrier and the side bearing race with a plastic hammer as shown in the figure.



6. Align the bearing cap alignment marks, assemble the bearing cap, and then temporarily tighten the bolts.

7. Install the dial gauge with the measuring probe of the dial gauge attached perpendicularly to the end of one of the ring gear teeth.



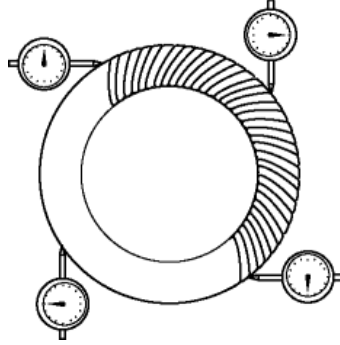
8. Secure the drive pinion and measure the backlash of the ring gear.

### Backlash of drive pinion and ring gear

- Standard: **0.09—0.11 mm {0.0035—0.0043 in}**
- Minimum value: **0.05 mm {0.0020 in}** or more
- Variance: **0.07 mm {0.0028 in}** or less

#### NOTE:

- Measure the backlash at 4 locations around the ring gear. Make sure all of the 4 locations are within specification, and the minimum value for the 4 locations is **0.05 mm {0.0020in}** or more and the variance is **0.07 mm {0.0028 in}** or less



9. If the backlash is not within the specification, adjust the gear case component by moving it in the axial direction.

#### NOTE:

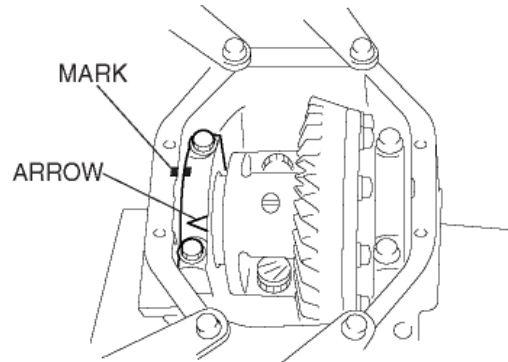
- When moving the gear case component in the axial direction, replace the adjustment shims. If the adjustment shim on the right side is replaced with one that is **0.05 mm {0.0020 in}** thicker, replace the one on the left with one that is **0.05 mm {0.0020 in}** thinner.

### Bearing Cap Assembly Note

1. Align the bearing cap alignment marks and assemble the bearing cap with the arrow facing outward.

#### Tightening torque

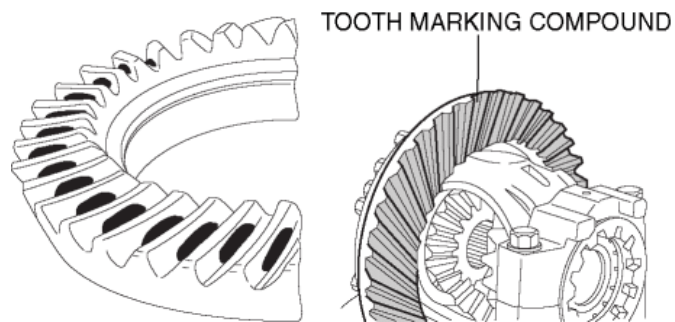
- 72.6—106.9 N·m {7.41—10.91 kgf·m, 53.5—78.84 ft·lbf}



2. Perform the drive pinion and ring gear tooth contact inspection.

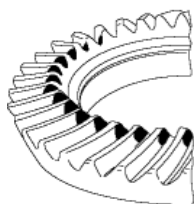
### Drive Pinion, Ring Gear Tooth Contact Inspection

1. Apply tooth marking compound evenly to both surfaces of the ring gear.
2. Rotate the ring gear back and forth for several times.
3. Inspect the tooth contact pattern in 4 locations around the ring gear, and verify that the tooth contact points exhibit the pattern shown in the figure.
  - If the tooth contact points are normal, wipe off the marking compound.
  - If the tooth contact points are not normal, adjust the pinion height, then adjust the backlash.

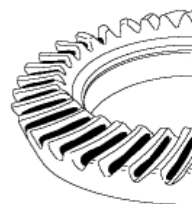


4. If the toe and flank contact points appear as shown in the figure after the drive pinion and ring gear teeth contact inspection, replace the spacer with a thinner one, and move the drive pinion outward.

TOE CONTACT

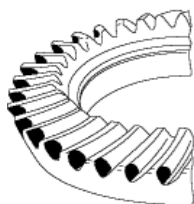


FLANK CONTACT

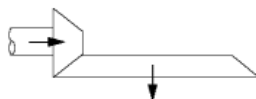
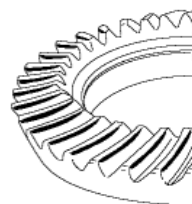


5. If the heel and face contact points appear as shown in the figure after the drive pinion and ring gear teeth contact inspection, replace the spacer with a thicker one, and move the drive pinion inward.

HEEL CONTACT



FACE CONTACT



## 2008 - MX-5 - DriveLine/Axle

### OIL SEAL (SIDE GEAR) REPLACEMENT

1. Remove the drain plug and drain the oil.
2. Install the drain plug with a new washer and tighten.

#### Tightening torque

- 39.2—53.9 N·m {4.00—5.49 kgf·m, 29.0—39.7 ft·lbf}

3. Disconnect the rear drive shaft on the differential side.

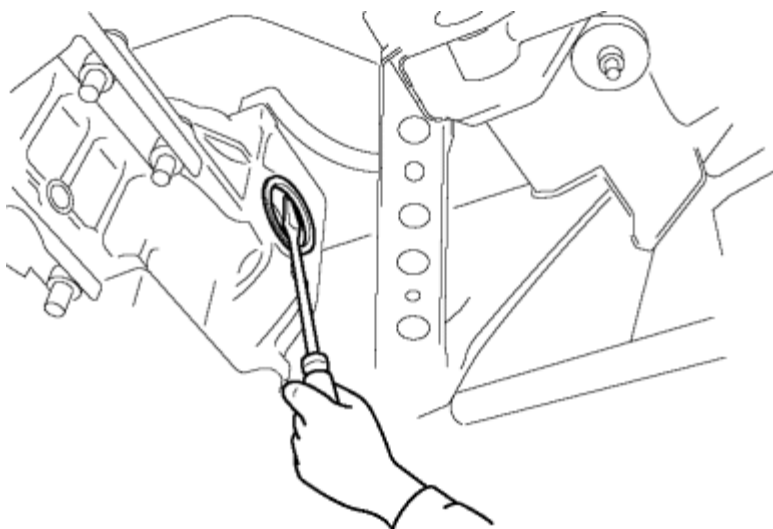
(See [REAR DIFFERENTIAL REMOVAL/INSTALLATION](#).)

4. Remove the clip from the rear drive shaft.

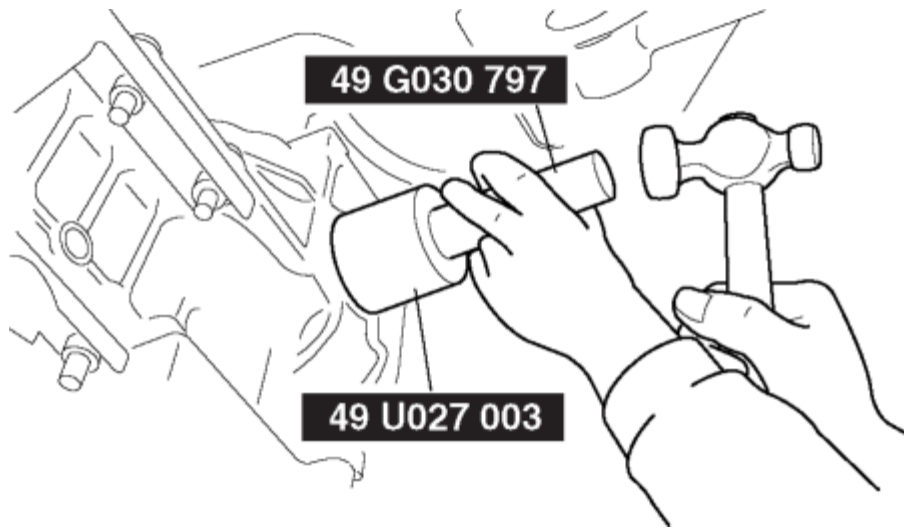
#### CAUTION:

- To prevent damaging the inside of the differential casing, wrap cloth on the end of the flathead screwdriver.

5. Remove the oil seal from the differential carrier using a flathead screwdriver.



6. Apply differential oil to the lip of a new oil seal.
7. Tap in the new oil seal until it reaches the differential carrier using the **SSTs**.



**NOTE:**

- Install the oil seal at a straight angle.

8. After installing a new clip to the rear drive shaft, insert it into the rear differential.

(See [REAR DIFFERENTIAL REMOVAL/INSTALLATION](#).)

9. Verify that the rear drive shaft is held securely by the clip by pulling the outer ring on the differential side towards the axle.

10. Add differential oil.

11. After adding the oil, perform the oil level inspection. (See [DIFFERENTIAL OIL INSPECTION](#).)

12. Install the oil-fill plug with a new washer and tighten.

**Tightening torque**

- 39.2—53.9 N·m {4.00—5.49 kgf·m, 29.0—39.7 ft·lbf}

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## 2008 - MX-5 - DriveLine/Axle

### OIL SEAL (COMPANION FLANGE) REPLACEMENT

1. Remove the rear differential. (See [REAR DIFFERENTIAL REMOVAL/INSTALLATION.](#))
2. Replace the oil seal (companion flange) referring to the rear differential disassembly/assembly procedure. (See [REAR DIFFERENTIAL DISASSEMBLY.](#)) (See [REAR DIFFERENTIAL ASSEMBLY.](#))
3. Install the rear differential. (See [REAR DIFFERENTIAL REMOVAL/INSTALLATION.](#))

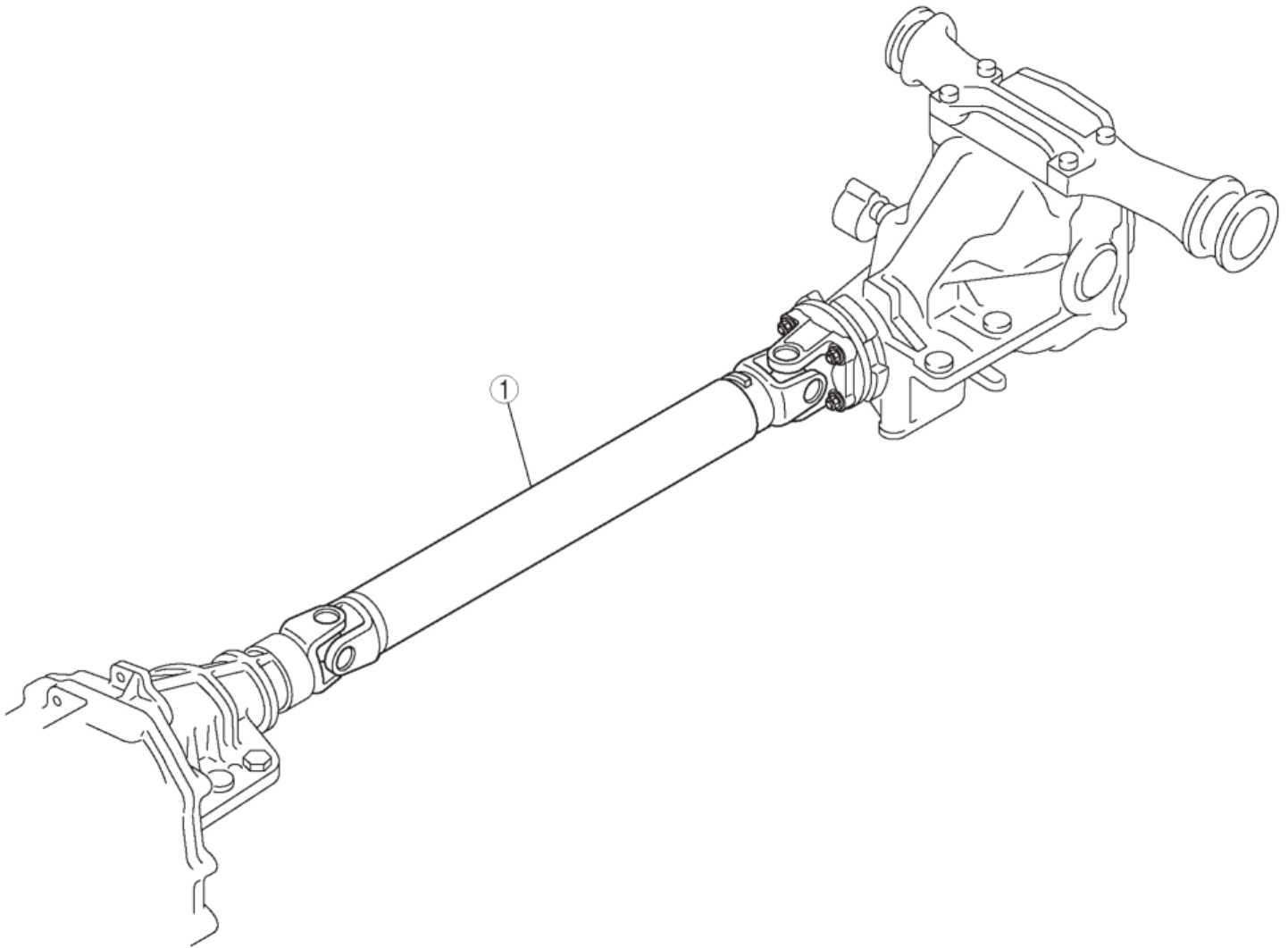
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## 2008 - MX-5 - DriveLine/Axle

### PROPELLER SHAFT LOCATION INDEX



1 Propeller shaft

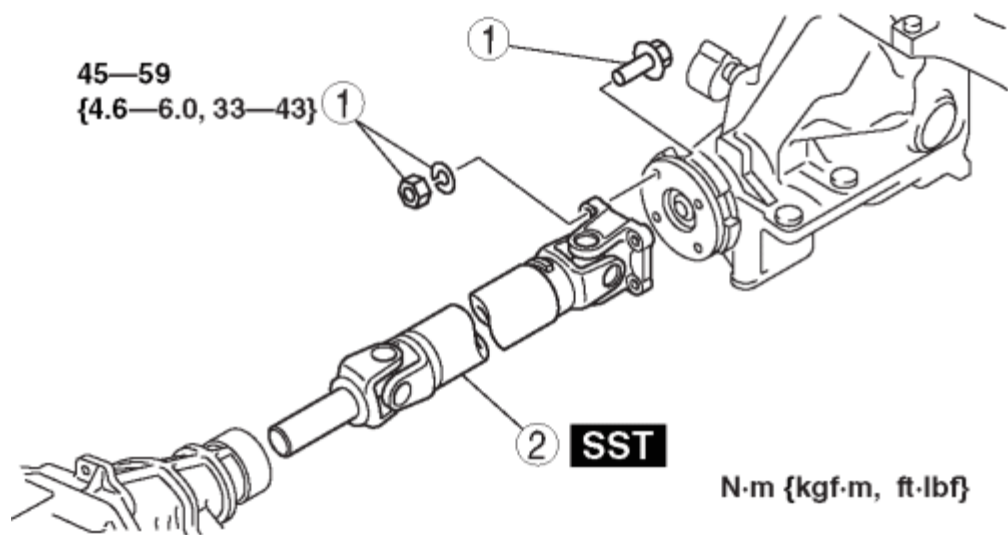
(See [PROPELLER SHAFT REMOVAL/INSTALLATION.](#))

(See [PROPELLER SHAFT INSPECTION.](#))

2008 - MX-5 - DriveLine/Axle

PROPELLER SHAFT REMOVAL/INSTALLATION

- 1. Remove the member and the middle pipe.  
(See [EXHAUST SYSTEM REMOVAL/INSTALLATION\[LF\]](#).)
- 2. Remove in the order indicated in the table.
- 3. Install in the reverse order of removal.



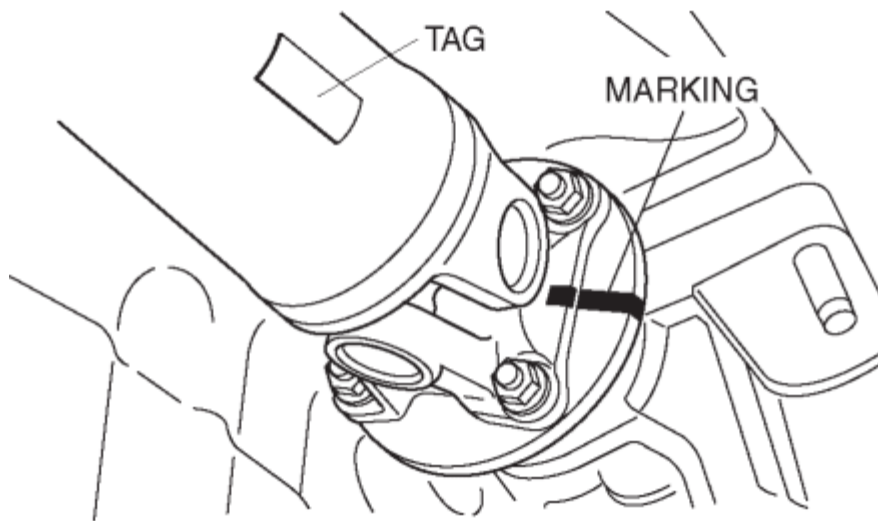
1	Bolt, nut
2	Propeller shaft (See <a href="#">Propeller Shaft Removal Note</a> .) (See <a href="#">Propeller Shaft Installation Note</a> .)

Propeller Shaft Removal Note

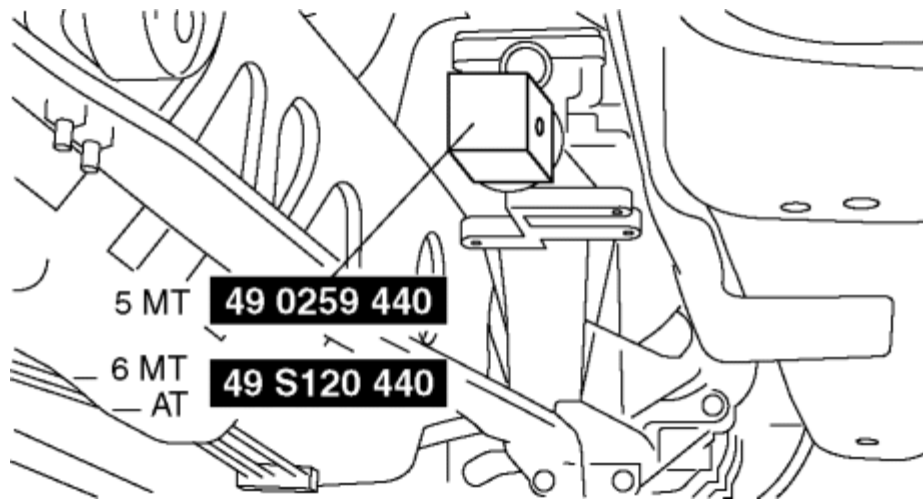
CAUTION:

- When replacing with a new propeller shaft, mark the companion flange to match the position of the tag on the propeller shaft.
1. Before removing the propeller shaft, make alignment marks on the yoke and differential companion flange.



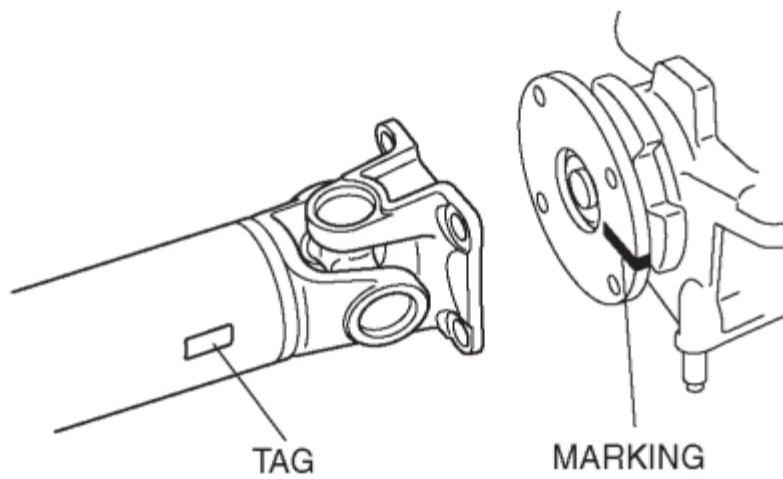


2. Install the **SST** to the extension housing.



### Propeller Shaft Installation Note

1. Align the marks and install the propeller shaft.
2. When installing a new propeller shaft, align the differential companion flange mark with the tag on the propeller shaft and assemble.



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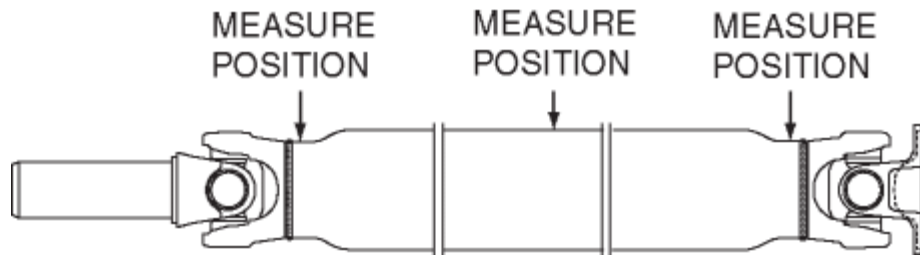
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## 2008 - MX-5 - DriveLine/Axle

### PROPELLER SHAFT INSPECTION

1. Use a dial gauge to measure the runout of the propeller shaft at each position.

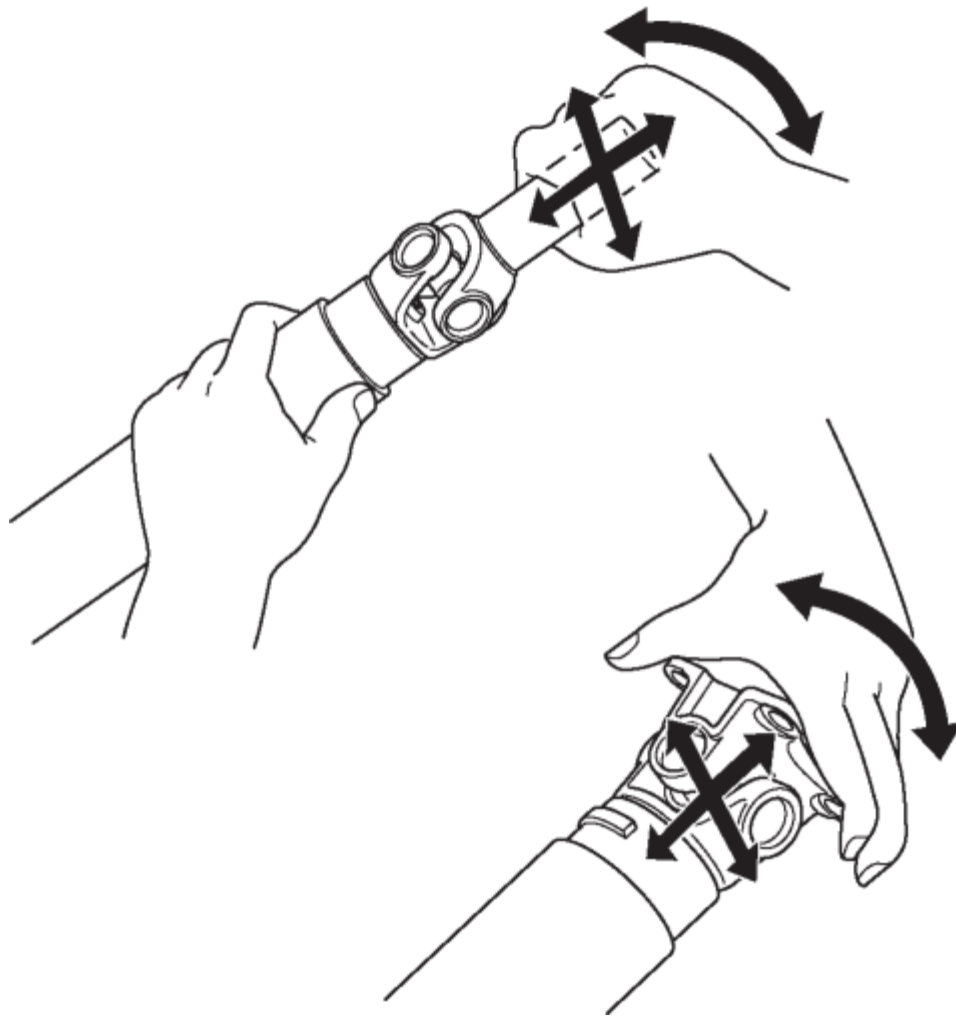


- If it exceeds the maximum specification, replace the propeller shaft.

#### **Maximum runout**

- 0.6 mm {0.024 in}

2. Inspect the play and rotation of the joint by turning the universal joint in the direction shown by the arrow.



**Initial torque (Reference value)**

- 0.29—0.98 N·m  
{ 3.0—10 kgf·cm, 2.7—8.6 in·lbf }
- If there is excessive play or initial torque, replace the propeller shaft.

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## 2008 - MX-5 - DriveLine/Axle

### DRIVELINE/AXLE TECHNICAL DATA

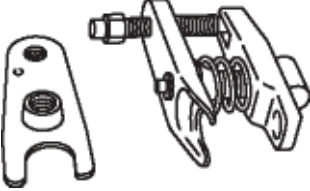
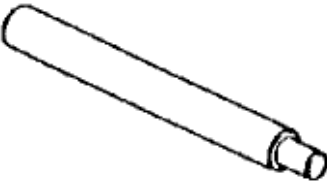

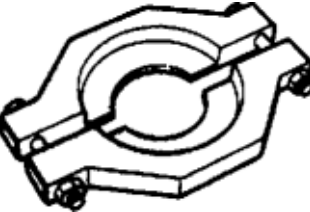


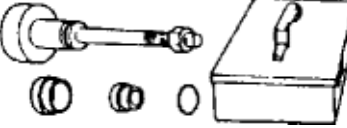
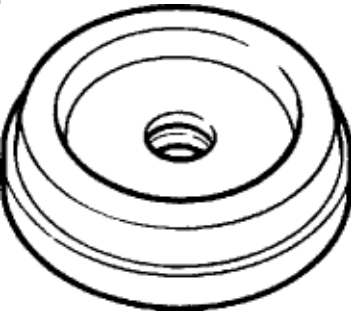


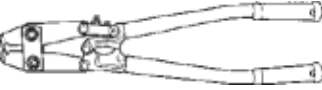
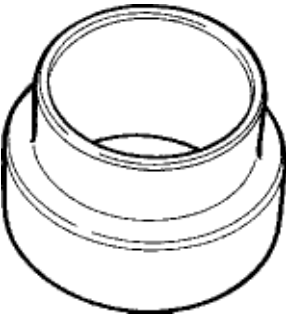
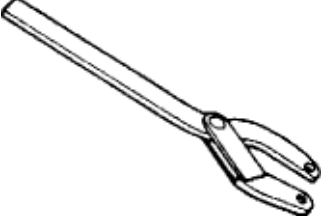
Item	Specification
Maximum front wheel bearing play	0.05 mm {0.002 in}
Maximum rear wheel bearing play	0.05 mm {0.002 in}
Drive shaft length	Left side: 778.5—788.5 {30.65—31.04} Right side: 818.5—828.5 {32.22—32.62}
Differential oil	Grade: API service GL-5 Viscosity: SAE 90, SAE 80W-90, SAE 75W-90 (Not available from Mazda) Capacity (approx. quantity): 0.6—0.8 L {0.63— 0.85 US qt, 0.53—0.70 Imp qt}
Backlash of pinion gear and side gear	0.1 mm {0.004 in} or less
Differential pinion height	0.038 mm {0.0015 in} or less
Differential drive pinion preload	1.3—1.8 N·m {14—18 kgf·cm, 12.1—15.6 in·lbf}
Backlash of drive pinion and ring gear	Standard: 0.09—0.11 mm {0.0035—0.0043 in} Minimum value: 0.05 mm {0.0020 in} or more Variance: 0.07 mm {0.0028 in} or less
Propeller shaft maximum runout	0.6 mm {0.024 in}
Propeller shaft initial torque (Reference value)	0.29—0.98 N·m

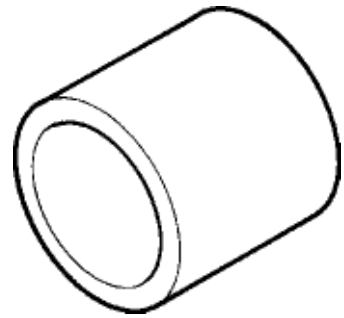
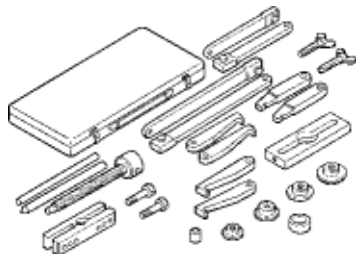
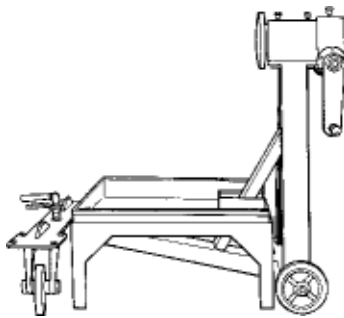

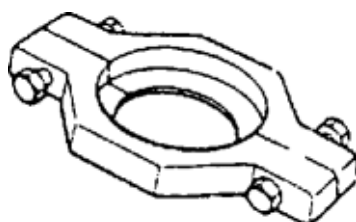

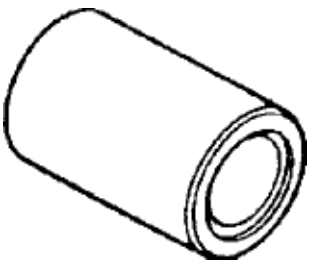
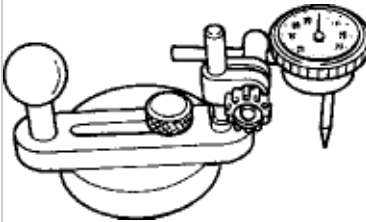
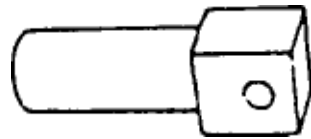
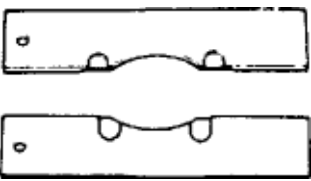

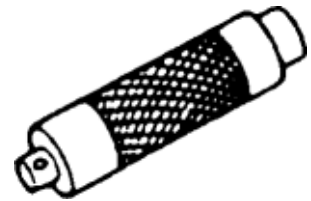
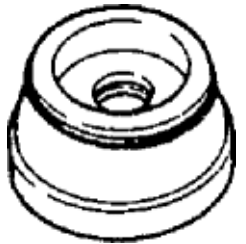

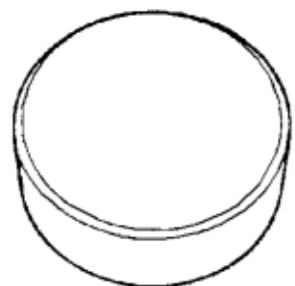
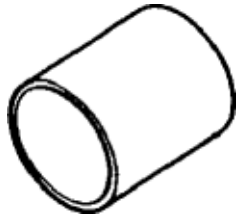
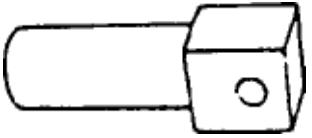


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## 2008 - MX-5 - DriveLine/Axle

### DRIVELINE/AXLE SST

49 T028 3A0  Ball joint puller set		49 G033 102  Handle		49 G033 105  Attachment	
49 H027 002  Bearing remover		49 F027 007  Attachment ø72		49 F401 331  Body	
49 8531 565  Drive pinion model		49 F027 004  Attachment ø80		49 H034 201  Support block	
49 F027 009  Attachment ø68&77		49 T025 001  Boot clamp crimper		49 F401 337A  Attachment IN ø35	
49 U027 003  Oil seal installer		49 S120 710  Coupling flange holder		49 0839 425C  Bearing puller set	

					
49 0107 680A  Engine stand		49 M005 561  Diff carrier hunger		49 0636 145  Fan pulley boss puller	
49 UB71 525  Bearing installer		49 8038 785A  Dust boot installer		49 0727 570  Pinion height adjust gauge	
49 S120 440  Mainshaft holder		49 F026 103  Wheel hub puller		49 W010 107A  Oil seal installer	
49 G030 797  Handle		49 F027 005  Attachment ø62		49 8531 567  Collar A (Part of 49 8531 565)	
49 N027 001  Gauge block		49 H027 001  Collar		49 0259 440  Mainshaft holder	



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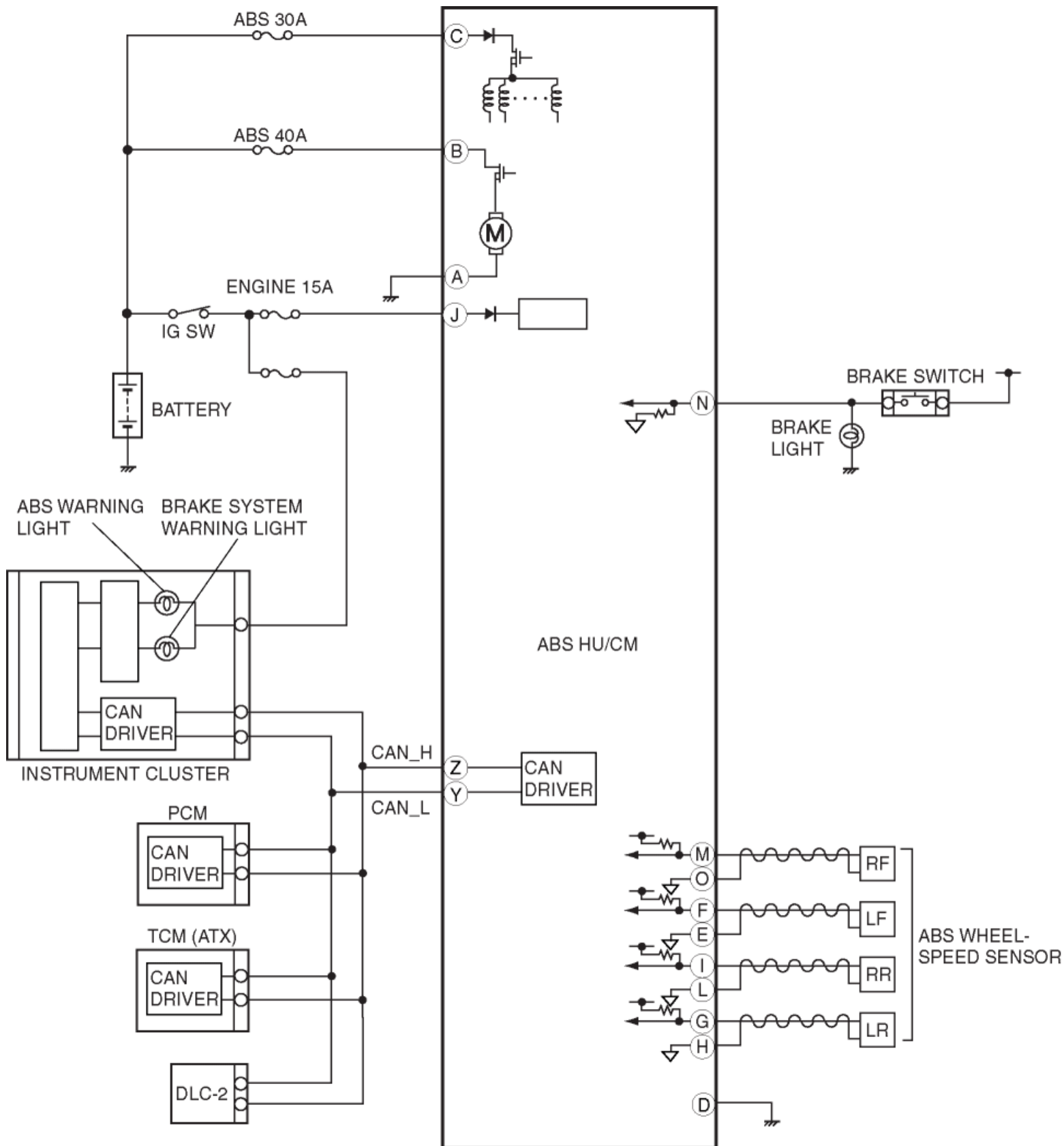
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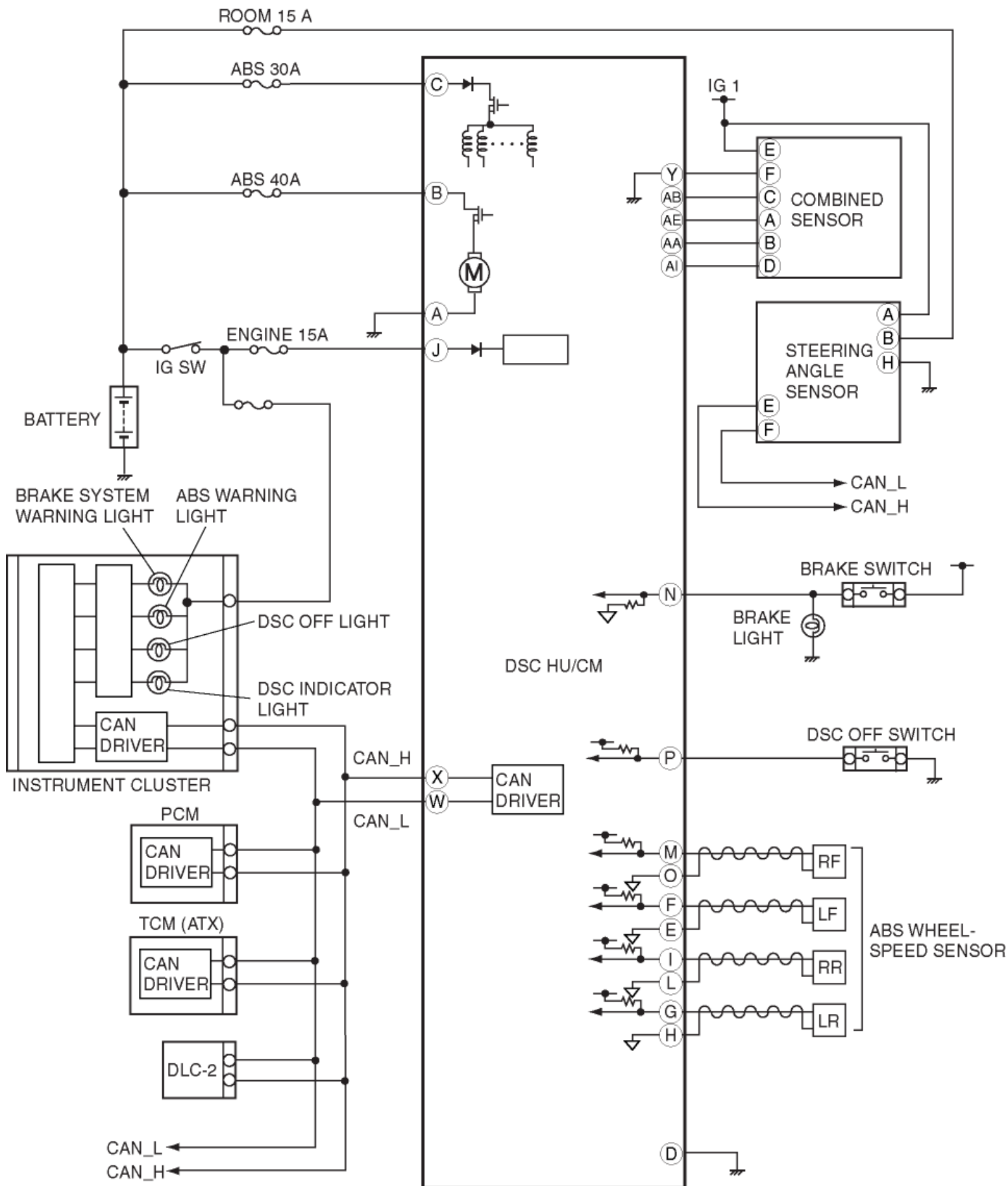
2008 - MX-5 - Brakes

SYSTEM WIRING DIAGRAM

Vehicle with ABS



Vehicle with DSC





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## 2008 - MX-5 - Brakes

### FOREWORD

- Before performing the steps in Symptom Troubleshooting, perform the On-board Diagnostic Inspection. To check the DTC, follow the DTC Inspection steps. (See **ON-BOARD DIAGNOSIS[ABS]**.) (See **ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]**.)

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2008 - MX-5 - Brakes

PRECAUTION

Vehicle with ABS

1. Any one or a combination of the ABS warning and BRAKE system warning lights illuminate even when the system is normal.

Warning lights that may illuminate and/or flash	Condition under which the light may illuminate	Conditions under which the light will go out	ABS, EBD control
<div>Any or all the following lights illuminate:</div> <div><ul style="list-style-type: none"><li>• ABS warning light</li><li>• BRAKE system warning light (*1)</li></ul></div>	<div><ul style="list-style-type: none"><li>• When the front wheels are jacked up, stuck, or placed on a chassis roller, and only the front wheel ABS wheel speed sensors are spun for <b>20 s or more</b>.</li></ul></div>	<div>After turning ignition switch off, vehicle is driven at speed <b>greater than 10 km/h {6.2 mph}</b> and normal operation is confirmed.</div>	<div><ul style="list-style-type: none"><li>• ABS: Disables control.</li><li>• EBD:<div><div>1. Disable control, in cases where the light may illuminate, only when ABS HU/CM detects that wheel speed sensors determine that two or more rear wheels are malfunctioning.</div><div>2. Enables control, if wheel speed sensors determine that three or more wheels are functioning correctly.</div></div></li></ul></div>
	Parking brake is not fully released while driving.		
	Brake drag.		
	Sudden acceleration/deceleration.		
	Left/right or front/rear tires are different. (Size,		

	radius, tire pressure, or wear is other than that listed on tire label.)		
All the following lights illuminate: <ul style="list-style-type: none"> <li>• ABS warning light</li> <li>• BRAKE system warning light</li> </ul>	Battery voltage at ABS HU/CM ignition terminal J drops <b>below approx. 9 to 10 V.</b> (*2)	Battery voltage rises <b>above approx. 10 V.</b>  (Only BRAKE system warning light goes out.)	ABS: Enables control.  EBD: Enables control.

\*1

**The light will illuminate only when ABS HU/CM detects that a rear wheel speed sensor is malfunctioning.**

\*2

**If battery voltage drops below 9 V while vehicle speed is greater than 6 km/h {3.7 mph} , the ABS HU/CM stores DTC B1318.**

## 2. Precautions during servicing of ABS

The ABS is composed of electrical and mechanical parts. It is necessary to categorize malfunctions as being either electrical or hydraulic when performing troubleshooting.

### a. Malfunctions in electrical system

- The ABS HU/CM has an on-board diagnostic function. With this function, any one or a combination of the ABS warning light and BRAKE system warning light will illuminate when there is a problem in the electrical system. Also, past and present malfunctions are stored in the ABS HU/CM. This function can find malfunctions that do not occur during periodic inspections. Connect the M-MDS to the DLC 2. Stored malfunctions will be displayed in the order of occurrence. To find out the causes of ABS malfunctions, use these on-board diagnostic results.
- If a malfunction occurred in the past but is now normal, the cause is likely a temporary poor connection of the wiring harness. The ABS HU/CM usually operates normally. Be careful when searching for the cause of malfunction.
- After repair, it is necessary to clear the DTC from the ABS HU/CM memory.

Also, if the ABS related parts have been replaced, verify that no DTC is displayed after repairs.

- After repairing the ABS wheel-speed sensor or ABS sensor rotor, or after replacing the ABS HU/CM, the ABS warning light may not go out (\*) even when the ignition switch is turned to the ON position. In this case, drive the vehicle at a speed of **10 km/h {6.2 mph} or more**, make sure that ABS warning light goes out, and then clear the DTC.

\* The BRAKE system warning light also illuminates when there is any rear wheel deformation.

- When repairing, if the ABS related connectors are disconnected and the ignition switch is turned to the ON position, the ABS HU/CM will mistakenly detect a fault and record it as a malfunction.



- To protect the ABS HU/CM, make sure the ignition is off before connecting or disconnecting the ABS HU/CM connector.

b. Malfunctions in hydraulic system

- Symptoms in a hydraulic system malfunction are similar to those in a conventional brake malfunction. However, it is necessary to determine if the malfunction is in an ABS component or the conventional brake system.
- The ABS hydraulic unit contains delicate mechanical parts. If foreign material gets into the component, the ABS may fail to operate. Also, it will likely become extremely difficult to find the location of the malfunction in the event that the brakes operate but the ABS does not. Make sure foreign material does not enter when servicing the ABS (e.g. brake fluid replacement, pipe removal).

## Vehicle with DSC

1. The ABS warning light and/or BRAKE system warning light and/or DSC indicator light and/or DSC OFF light illuminate even when the system is normal.

Warning lights that may illuminate and/or flash	Condition under which the light may illuminate	Conditions under which the light will go out	ABS, EBD, TCS and DSC control
<ul style="list-style-type: none"> <li>• ABS warning light</li> <li>• BRAKE system warning light</li> <li>• DSC indicator light</li> </ul>	Under any of the following conditions: <ul style="list-style-type: none"> <li>• When the front wheels are jacked up, stuck, or placed on a chassis roller, and only the front wheel ABS wheel speed sensors are spun for <b>20 s or more</b>.</li> </ul>	After turning ignition switch off, vehicle is driven at speed <b>greater than 10 km/h {6.2 mph}</b> and normal operation is confirmed.	<ul style="list-style-type: none"> <li>• ABS: Disables control.</li> <li>• EBD:               <ol style="list-style-type: none"> <li>1. Disable control, in cases where the light may illuminate, only when ABS HU/CM detects that wheel speed sensors determine that two or more wheels are malfunctioning.</li> <li>2. Enables control, if wheel speed sensors determine three or more wheels are functioning correctly.</li> </ol> </li> <li>• TCS: Disables control.</li> <li>• DSC: Disables control.</li> </ul>
	Parking brake is not fully released while driving.		
	Brake drag.		
	Sudden acceleration/deceleration.		

	Left/right or front/rear tires are different. (Size, radius, tire pressure, or wear is other than that listed on tire label.)		
	Battery voltage at DSC HU/CM ignition terminal drops <b>below approx. 10 V.</b>	Battery voltage rises <b>above approx. 10 V.</b>	ABS: Disables control. EBD: Enables control. TCS: Disables control. DSC: Disables control.
<ul style="list-style-type: none"> <li>Brake system warning light</li> </ul>	Brake fluid amount is low.	Brake fluid level lower than recommended amount.	ABS: Enables control. EBD: Enables control. TCS: Enables control. DSC: Enables control.

## 2. Precautions during servicing of DSC

The DSC is composed of electrical and mechanical parts. It is necessary to categorize malfunctions as being either electrical or hydraulic when performing troubleshooting.

### a. Malfunction in electrical system

- The control module has an on-board diagnostic function. With this function, the ABS warning light and/or BRAKE system warning light and/or DSC indicator light and/or DSC OFF light will illuminate when there is a problem in the electrical system.

Also, past and present malfunctions are in the control module. This function can find malfunctions that do not occur during periodic inspections. Connect the M-MDS to the DLC-2, the stored malfunctions will be displayed in the order of occurrence. To find out the causes of DSC malfunctions, use these on-board diagnostic results.

- If a malfunction occurred in the past but is now normal, the cause is likely a temporary poor connection of the wiring harness.

The control module usually operates normally. Be careful when searching for the cause of malfunction.

- After repair, it is necessary to clear the DTC from the control module memory.

Also, if the DSC related parts have been replaced, verify that no DTC is displayed after repairs.

- After repairing the ABS wheel-speed sensor or ABS sensor rotor, or after replacing the control module, the ABS warning light may not go out even when the ignition switch is turned to the ON position. In this case, drive the vehicle at a speed of **more than 10 km/h {6.2 mph}**, make sure the ABS warning light goes out, and then clear the DTC.
- When repairing, if the DSC related connectors are disconnected and the ignition switch is turned to the ON position, the control module will mistakenly detect a fault and record it as a malfunction.

### CAUTION:

- In DSC vehicles, when the DSC HU/CM, steering angle sensor, or combined sensor is replaced, perform the initialization procedure for each sensor. (See **STEERING ANGLE SENSOR INITIALIZATION PROCEDURE.**) (See **COMBINED SENSOR INITIALIZATION PROCEDURE.**) (See **STEERING ANGLE SIGNAL INITIALIZATION PROCEDURE.**)
- To protect the control module, make sure the ignition is off before connecting or disconnecting the control module connector.

#### b. Malfunctions in hydraulic system

- Symptoms in a hydraulic system malfunction are similar to those in a conventional brake malfunction. However, it is necessary to determine if the malfunction is in a DSC component or the conventional brake system.
- The hydraulic unit contains delicate mechanical parts. If foreign material gets into the component, the DSC may fail to operate. Also, it will likely become extremely difficult to find the location of the malfunction in the event that the brakes operate but the DSC does not. Make sure foreign material does not enter when servicing the DSC (e.g.brake fluid replacement, pipe removal).

## Intermittent Concern Troubleshooting

### Vibration method

- If a malfunction occurs or becomes worse while driving on a rough road or when the engine is vibrating, perform the following steps.

### NOTE:

- There are several reasons why vehicle or engine vibration could cause an electrical malfunction. Inspect the following:
  - Connectors not fully seated.
  - Wire harnesses not having full play.
  - Wires laying across brackets or moving parts.
  - Wires routed too close to hot parts.
- An improperly routed, improperly clamped, or loose harness can cause wiring to become pinched between parts.
- The connector joints, points of vibration, and places where wiring harnesses pass through the firewall, body and other panels are the major areas to be inspected.

### Inspection method for switch connectors or wires

1. Connect the M-MDS to DLC-2.
2. Turn the ignition switch to the ON position (engine off).

### NOTE:

- If the engine starts and runs, perform the following steps at idle.
3. Access PIDs for the switch you are inspecting.
  4. Turn the switch on manually.

5. Slightly shake each connector or wiring harness vertically and horizontally while monitoring the PID.



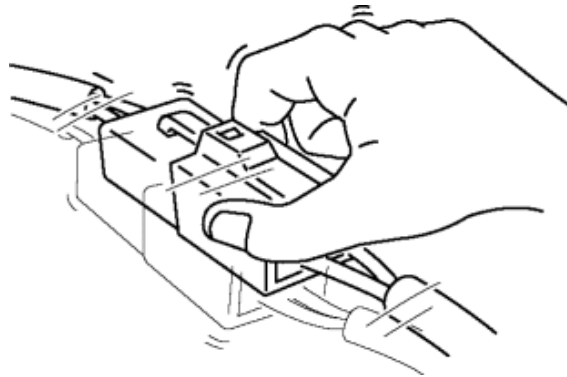
- If the PID value is unstable, inspect for poor connection.

#### Inspection method for sensor connectors or wires

1. Connect the M-MDS to the DLC-2.
2. Turn the ignition switch to the ON position (engine off).

#### NOTE:

- If the engine starts and runs, perform the following steps at idle.
3. Access PIDs for the switch you are inspecting.
  4. Slightly shake each connector or wiring harness vertically and horizontally while monitoring the PID.



- If the PID value is unstable, inspect for poor connection.

#### Inspection method for sensors

1. Connect the M-MDS to DLC-2.
2. Turn the ignition switch to the ON position (engine off).

#### NOTE:

- If engine starts and runs, perform the following steps at idle.
3. Access PIDs for the switch you are inspecting.
  4. Vibrate the sensor slightly with your finger.
- If the PID value is unstable or a malfunction occurs, inspect for poor connection and/or

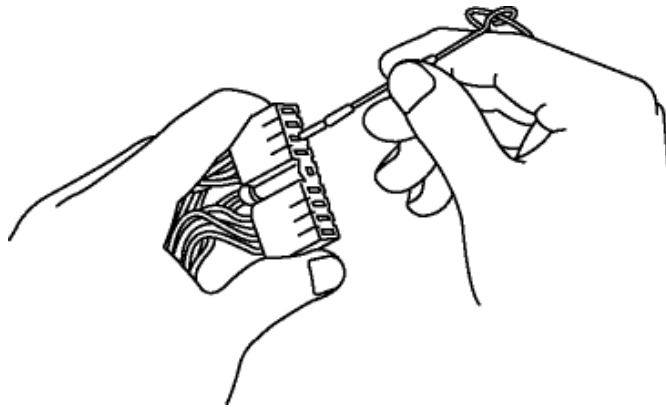
poorly mounted sensor.

#### **Malfunction data monitor method**

1. Perform the malfunction reappearance test according to malfunction reappearance mode and malfunction data monitor. The malfunction cause is found in the malfunction data.

#### **Inspection method for connector terminal**

1. Inspect the connection condition of each female terminal.
2. Insert the male terminal, and fit the female terminal side to female terminal. Inspect if the malfunction is in the female terminal.



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SYMPTOM TROUBLESHOOTING

- Verify the symptoms, and perform troubleshooting according to the appropriate number.

Vehicle with ABS

No.	Symptom
1	Neither ABS warning light nor BRAKE system warning light illuminate when the ignition switch is turned to the ON position.
2	ABS warning light does not illuminate when the ignition switch is turned to the ON position.
3	BRAKE system warning light does not illuminate when the ignition switch is turned to the ON position.
4	Both ABS warning light and BRAKE system warning light stay on <b>4 s or more</b> when the ignition switch is turned to the ON position.
5	ABS warning light stays on <b>4 s or more</b> when the ignition switch is turned to the ON position.
6	BRAKE system warning light stays on <b>4 s or more</b> when the ignition switch is turned to the ON position. (Parking brake is released.)

Vehicle with DSC

No.	Symptom
7	Any of the following lights do not illuminate when the ignition switch is turned to the ON position. <ul style="list-style-type: none"><li>• ABS warning light</li><li>• BRAKE system warning light</li><li>• DSC indicator light</li><li>• DSC OFF light</li></ul>
8	Any of the following lights remain on: <ul style="list-style-type: none"><li>• ABS warning light.</li><li>• BRAKE system warning light</li><li>• DSC indicator light</li><li>• DSC OFF light</li></ul>
9	There is a malfunction in the system even though ABS warning light, BRAKE system warning light, DSC indicator light and DSC OFF light do not illuminate.
10	ABS or TCS* <sup>1</sup> operates frequently.  TCS does not work correctly.
11	DSC* <sup>2</sup> operates frequently.

DSC does not work correctly.

\*1

DSC system contains traction control function; DSC indicator light illuminates and goes out while TCS is operating.

\*2

DSC indicator light illuminates and goes out while DSC is operating.

Vehicle with ABS

x: Applicable

Possible factor																
Troubleshooting item		ABS HU/CM	Instrument cluster	CAN communication	Battery	Brake fluid	Brake fluid level sensor	Parking brake switch	Charging system	ABS HU/CM power supply (terminal J)	ABS HU/CM ground 1 (terminal D)	Instrument cluster power supply (terminal 1G)	Instrument cluster ground (terminal 1E)	Tire size, tire air pressure	Conventional brakes	Brake pipe routing
1	Neither ABS warning light nor BRAKE system warning light illuminates when the ignition switch is turned to the ON position.	X	X									X	X			
2	ABS warning light does not illuminate when the ignition switch is turned to the ON position.	X	X													
3	BRAKE system warning light does not illuminate when the ignition switch is turned to the ON position.	X	X													
4	Both ABS warning light and BRAKE system warning light stay on 4 s or more when the ignition switch is turned to the ON position.	X	X	X	X				X	X	X					
5	ABS warning light stays on 4 s or more when the ignition switch is turned to the ON position.	X	X	X												
6	BRAKE system warning light stays on 4 s or more when the ignition switch is turned to the ON position.	X	X	X		X	X	X								

Vehicle with DSC

Possible factor																
Troubleshooting item		DSC HU/CM	Instrument cluster	CAN communication	Each sensor installation	Battery	Charging system	Brake fluid	Parking brake	Tire	Tire air pressure	Control module power supply system	Control module ground system	Instrument cluster power supply system	Instrument cluster ground system	Conventional brake
7	Any of the following lights do not illuminate when the ignition switch is turned to the on position: (ABS warning light, BRAKE system warning light, DSC indicator light and/or DSC OFF light).	X	X	X										X	X	
8	Any of the following lights remain on: (ABS warning light, BRAKE system warning light, DSC indicator light and/or DSC OFF light).		X	X		X	X	X	X			X	X			
9	There is a malfunction in the system even though ABS warning light, DSC indicator light, and DSC OFF light do not illuminate.															X
10	ABS or TCS (*1) operates frequently. /TCS does not work correctly. (*1): DSC system contains traction control function; DSC indicator light goes on and off while DSC is operating.				X					X	X					
11	DSC (*2) operates frequently. /DSC does not work correctly. (*2): DSC indicator light goes on and while TCS is operating.				X					X	X					



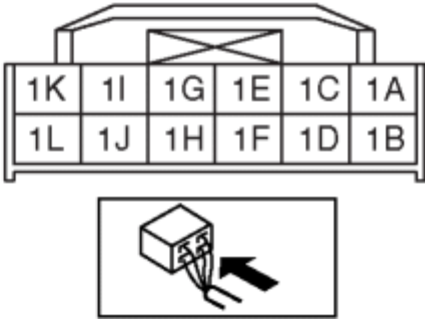
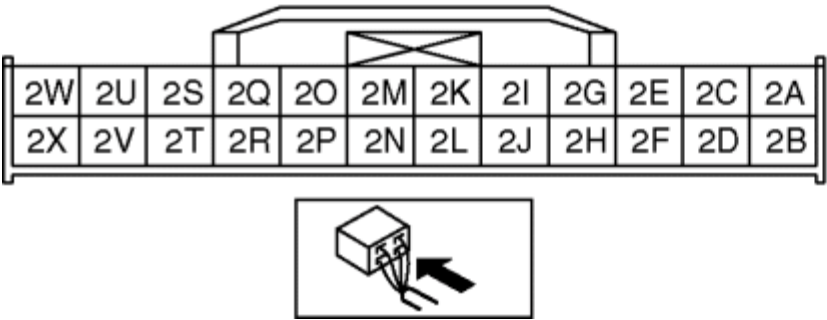
## 2008 - MX-5 - Brakes

### NO.1 NEITHER ABS WARNING LIGHT NOR BRAKE SYSTEM WARNING LIGHT ILLUMINATE WHEN THE IGNITION SWITCH IS TURNED TO THE ON POSITION

1	ABS warning light and BRAKE system warning light do not illuminate when the ignition switch is turned to ON position.		
[TROUBLESHOOTING HINTS]			
<ul style="list-style-type: none"><li>• Malfunction of instrument cluster or ABS HU/CM</li><li>• Improper configuration (instrument cluster)</li></ul>			
STEP	INSPECTION		ACTION
1	VERIFY WHETHER MALFUNCTION IS IN COMMON POWER SUPPLY OF WARNING LIGHTS AND INDICATOR LIGHTS, OR IN OTHER WARNING LIGHTS AND INDICATOR LIGHTS		YesGo to step 4.
	<ul style="list-style-type: none"><li>• Do other warning and indicator lights illuminate when the ignition switch is turned to the ON position?</li></ul>		NoGo to the next step.
2	INSPECT INSTRUMENT CLUSTER POWER SUPPLY FUSE		YesGo to the next step.
	<ul style="list-style-type: none"><li>• Is the instrument cluster ignition power supply fuse normal?</li></ul>		NoInspect for a short to ground on the circuit with the blown fuse.  Repair or replace if necessary.  Install appropriate amperage fuse.
*3	VERIFY WHETHER MALFUNCTION IS IN WIRING HARNESS (INSPECT FOR CONTINUITY BETWEEN INSTRUMENT CLUSTER POWER SUPPLY AND INSTRUMENT CLUSTER) OR INSTRUMENT CLUSTER		YesReplace the instrument cluster (open circuit in instrument cluster).  (See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION.</b> )
	<ul style="list-style-type: none"><li>• Turn the ignition switch to the ON position.</li><li>• Measure the voltage at instrument cluster connector (12-pin) terminal 1G.</li><li>• Is the voltage <b>approx. 12 V?</b></li></ul>		NoInspect for an open circuit between the instrument cluster and ground.

			Repair or replace if necessary.
4	<b>CONFIRM DTC U1900 USING M-MDS</b> <ul style="list-style-type: none"><li>Retrieve DTCs from the PCM, ABS and instrument cluster.</li><li>Is DTC U1900 retrieved?</li></ul>	Yes	Go to the next step.
		No	Inspect the instrument cluster. If normal, go to Step 6.
5	<b>CONFIRM DTCS U0121, U0100 AND U0214 USING M-MDS:</b> <ul style="list-style-type: none"><li>Retrieve DTCs from the instrument cluster.</li><li>Are DTCs U0121, U0100 and U0214 retrieved?</li></ul>	Yes	Replace the instrument cluster (open circuit in instrument cluster).  (See <a href="#">INSTRUMENT CLUSTER REMOVAL/INSTALLATION.</a> )
		No	Inspect network communication for related system malfunction.  Repair or replace if necessary.
6	<b>CONFIRM DTC B2477 FOR INSTRUMENT CLUSTER USING M-MDS</b> <ul style="list-style-type: none"><li>Is DTC B2477 retrieved?</li></ul>	Yes	Perform instrument cluster configuration.  (See <a href="#">INSTRUMENT CLUSTER CONFIGURATION.</a> )
		No	Replace the ABS HU/CM.  (See <a href="#">ABS HU/CM REMOVAL/INSTALLATION.</a> )

INSTRUMENT CLUSTER WIRING HARNESS-SIDE CONNECTOR



- When performing an asterisked (\*) troubleshooting inspection, slightly shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, verify that the connectors, terminals and wiring harness are connected correctly and undamaged.

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2008 - MX-5 - Brakes

NO.2 ABS WARNING LIGHT DOES NOT ILLUMINATE WHEN IGNITION SWITCH TURNED TO ON POSITION

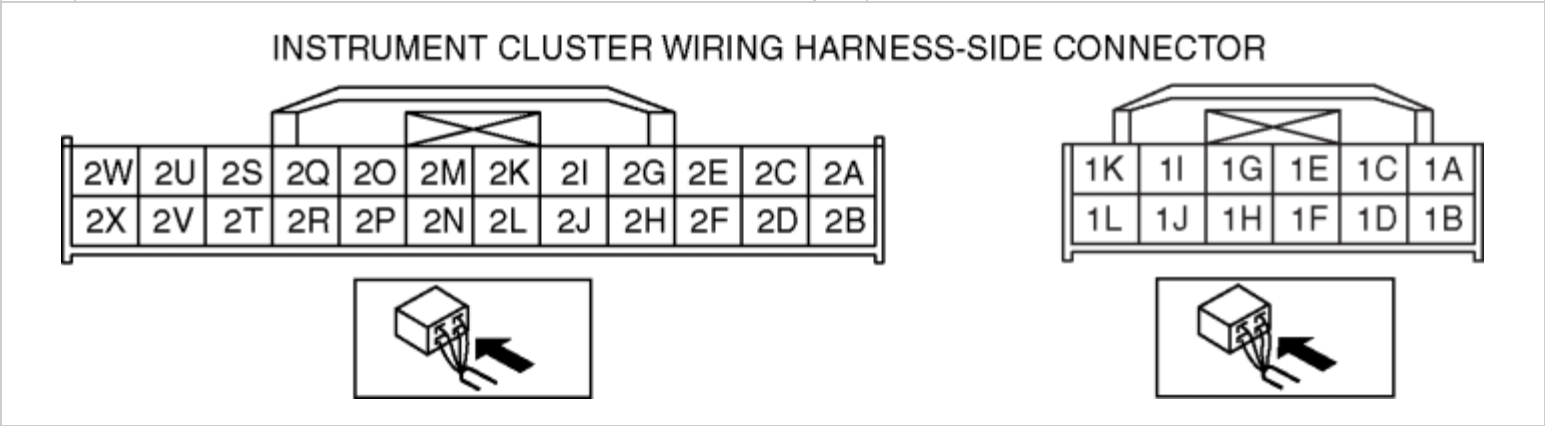
2ABS warning light does not illuminate when the ignition switch is turned to the ON position.

[TROUBLESHOOTING HINTS]

- Malfunction of instrument cluster or ABS HU/CM

Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>CONFIRM DTC U1900 USING M-MDS</b> <ul style="list-style-type: none"><li>Retrieve DTCs from the PCM, ABS and instrument cluster.</li><li>Is DTC U1900 retrieved?</li></ul>	YesGo to the next step.
		NoInspect the instrument cluster. If normal, go to the next step.
2	<b>CONFIRM DTCS U0121, U0100 AND U0214 USING M-MDS:</b> <ul style="list-style-type: none"><li>Retrieve DTCs from the instrument cluster.</li><li>Are DTCs U0121, U0100 and U0214 retrieved?</li></ul>	YesReplace the instrument cluster (open circuit in instrument cluster).  (See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION.</b> )
		NoInspect the network communication for a related system malfunction.  Repair or replace if necessary.





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NO.3 BRAKE SYSTEM WARNING LIGHT DOES NOT ILLUMINATE WHEN THE IGNITION SWITCH IS TURNED TO THE ON POSITION

3 BRAKE system warning light does not illuminate when the ignition switch is turned to the ON position.

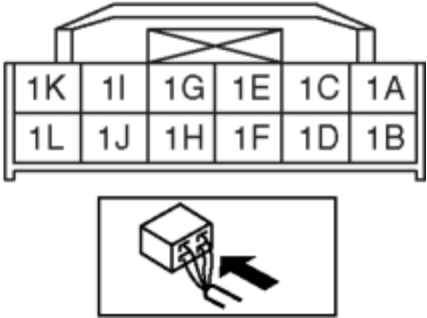
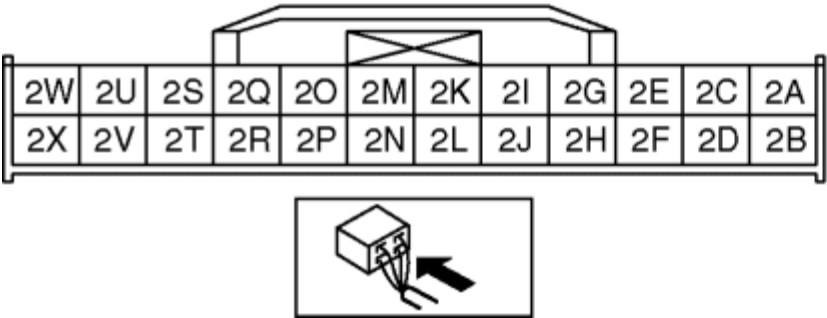
[TROUBLESHOOTING HINTS]

- Malfunction of instrument cluster or ABS HU/CM

Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>CONFIRM DTC U1900 USING M-MDS</b> <ul style="list-style-type: none"><li>• Retrieve DTCs from the PCM, ABS and instrument cluster.</li><li>• Is DTC U1900 retrieved?</li></ul>	YesGo to the next step.
		No Inspect the instrument cluster. If normal, go to the next step.
2	<b>CONFIRM DTCS U0121, U0100 AND U0214 USING M-MDS:</b> <ul style="list-style-type: none"><li>• Retrieve DTCs from the instrument cluster.</li><li>• Are DTCs U0121, U0100 and U0214 retrieved?</li></ul>	YesReplace the instrument cluster (open circuit in instrument cluster).  (See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION.</b> )
		No Inspect the network communication for a related system malfunction.  Repair or replace if necessary.

INSTRUMENT CLUSTER WIRING HARNESS-SIDE CONNECTOR



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## 2008 - MX-5 - Brakes

### NO.4 BOTH ABS WARNING LIGHT AND BRAKE SYSTEM WARNING LIGHT STAY ON 4 S OR MORE WHEN THE IGNITION SWITCH IS TURNED TO THE ON POSITION

4 Both ABS warning light and BRAKE system warning light stay on 4 s or more when the ignition switch is turned to the ON position.

#### [TROUBLESHOOTING HINTS]

- ABS HU/CM detects ABS proportioning system malfunction.
- ABS HU/CM detects low voltage in power supply (ABS CM ignition terminal J voltage is below about 9 to 10 V).
- ABS HU/CM does not operate.
- Malfunction of communication network.

#### Diagnostic procedure

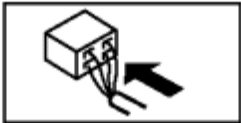
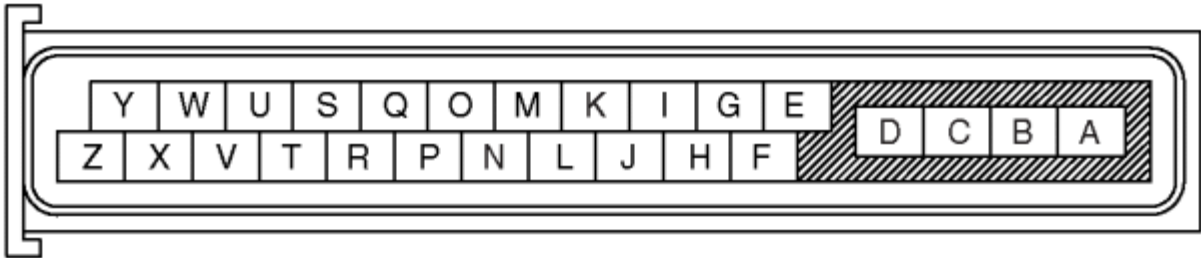
STEP	INSPECTION	ACTION
1	<b>INSPECT ABS HU/CM POWER SUPPLY FUSE</b> <ul style="list-style-type: none"> <li>Is the ABS HU/CM ignition power supply fuse normal?</li> </ul>	Yes Go to the next step.
		No Inspect for a short to ground on circuit with the blown fuse.  Repair or replace if necessary.  Install appropriate amperage fuse.
2	<b>INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC 2 FOR CONTINUITY AND SHORTS</b> <ul style="list-style-type: none"> <li>Perform DTC inspection.</li> <li>Is error message displayed regarding communication between ABS HU/CM and M-MDS?</li> </ul>	Yes If a communication error message is displayed even after inspecting according to the procedure displayed on the M-MDS, go to step 10.
		No Go to the next step.
3	<b>INSPECT FOR DTCS IN ABS HU/CM</b> <ul style="list-style-type: none"> <li>Have DTCs been stored in memory?</li> </ul>	Yes Perform the applicable DTC inspection.  (See <b>ON-BOARD DIAGNOSIS[ABS]</b> .)



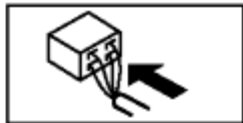
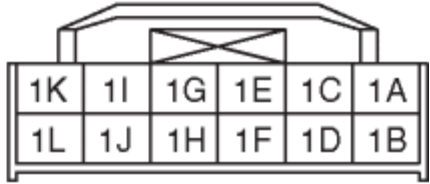
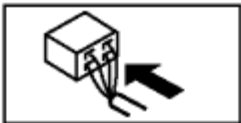
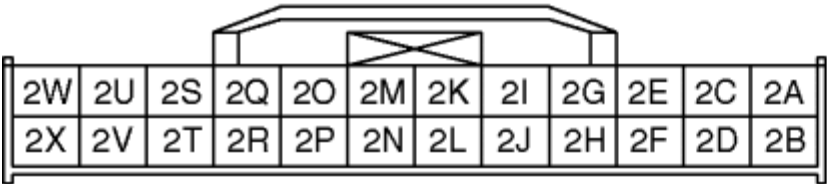
		No	Go to the next step.
4	<b>INSPECT WARNING LIGHT OPERATION</b> <ul style="list-style-type: none"> <li>Turn on the all warning light on instrument cluster using the instrument cluster input/output check code26.</li> <li>(See <b>INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.</b>)</li> <li>Do the ABS and BRAKE system warning light illuminate?</li> </ul>	Yes	Go to the next step.
		No	Replace the instrument cluster.  (See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION.</b> )
5	<b>INSPECT ABS HU/CM IGNITION POWER SUPPLY SYSTEM (TERMINAL J)</b> <ul style="list-style-type: none"> <li>Inspect the voltage for datalogger ABS_VOLT item using the M-MDS.</li> </ul> <b>Specification: approx. 10 V</b> <ul style="list-style-type: none"> <li>Is the voltage within specification?</li> </ul>	Yes	Replace the ABS HU/CM (open or short in ground circuit in ABS HU/CM).  (See <b>ABS HU/CM REMOVAL/INSTALLATION.</b> )
		No	Go to the next step.
6	<b>INSPECT BATTERY</b> <ul style="list-style-type: none"> <li>Is the battery voltage normal?</li> </ul>	Yes	Go to the next step.
		No	Inspect the battery and charging system.  (See <b>BATTERY INSPECTION [LF].</b> )  (See <b>GENERATOR INSPECTION [LF].</b> )
7	<b>INSPECT CHARGING SYSTEM</b> <ul style="list-style-type: none"> <li>Is the battery voltage normal with the electrical load (A/C, headlight, etc.) on and the engine idling?</li> </ul>	Yes	Go to the next step.
		No	Inspect the charging system (drive belt tension, generator, etc.).  (See <b>GENERATOR INSPECTION [LF].</b> )
*8	<b>INSPECT WIRING HARNESS BETWEEN ABS HU/CM POWER SUPPLY AND ABS HU/CM FOR CONTINUITY</b> <ul style="list-style-type: none"> <li>Disconnect the ABS HU/CM connector.</li> <li>Is the voltage <b>approx. 12 V</b> at connector terminal Z?</li> </ul>	Yes	Go to the next step.
		No	Inspect the ABS HU/CM connector for secure connection.
*9	<b>INSPECT WIRING HARNESS BETWEEN ABS HU/CM GROUND FOR CONTINUITY</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> </ul>	Yes	If a malfunction error message is displayed on the M-MDS in Step 1 inspection, go to the next step.  If a malfunction error message is not displayed on

	<ul style="list-style-type: none"> <li>Is there continuity between connector terminal D and the ground?</li> </ul>	<p>the M-MDS in Step 1 inspection, troubleshooting is completed.</p> <p>No Repair the wiring harness between ABS HU/CM and ground.</p>
*10	<b>INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC 2 FOR CONTINUITY</b> <ul style="list-style-type: none"> <li>Is there continuity between connector terminal Z, Y and DLC 2?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Repair the wiring harness between ABS HU/CM and DLC 2.</p>
*11	<b>INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC 2 FOR SHORT TO BATTERY</b> <ul style="list-style-type: none"> <li>Is the voltage <b>approx. 12 V</b> at connector terminal Z, Y?</li> </ul>	<p>Yes Repair the wiring harness between ABS HU/CM and DLC 2.</p> <p>No Go to the next step.</p>
*12	<b>INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC 2 FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>Is there continuity between connector terminal Z, Y and DLC 2?</li> </ul>	<p>Yes Repair the wiring harness between ABS HU/CM and DLC 2.</p> <p>No Replace the ABS HU/CM (communication circuit malfunction in ABS HU/CM).  (See <a href="#">ABS HU/CM REMOVAL/INSTALLATION.</a>)</p>

ABS HU/CM WIRING HARNESS-SIDE CONNECTOR



INSTRUMENT CLUSTER WIRING HARNESS-SIDE CONNECTOR



- When performing an asterisked (\*) troubleshooting inspection, slightly shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, verify that the connectors, terminals and wiring harness are connected correctly and undamaged.

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## 2008 - MX-5 - Brakes

### NO.5 ABS WARNING LIGHT STAYS ON 4 S OR MORE WHEN IGNITION SWITCH TURNED TO ON POSITION

5ABS warning light stays on 4 s or more when the ignition switch to the ON position.

#### [TROUBLESHOOTING HINTS]

- ABS HU/CM detects ABS system malfunction.

#### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC 2 FOR CONTINUITY AND SHORTS</b> <ul style="list-style-type: none"> <li>• Perform the DTC inspection.</li> <li>• Is an error message displayed regarding communication between the ABS HU/CM and the M-MDS?</li> </ul>	Yes If a communication error message is displayed even after inspecting according to procedures displayed in the M-MDS, go to Step 4.
		No Go to the next step.
2	<b>INSPECT FOR DTCs IN ABS HU/CM</b> <ul style="list-style-type: none"> <li>• Have DTCs been stored in memory?</li> </ul>	Yes Perform the applicable DTC inspection. (See <a href="#">ON-BOARD DIAGNOSIS[ABS].</a> )
		No Go to the next step.
3	<b>INSPECT WARNING LIGHT OPERATION</b> <ul style="list-style-type: none"> <li>• Turn on the all warning light on instrument cluster using the instrument cluster input/output check code26.  (See <a href="#">INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.</a>)</li> <li>• Does the warning light illuminate?</li> </ul>	Yes Replace the ABS HU/CM (open circuit or short to ground in ABS HU/CM).  (See <a href="#">ABS HU/CM REMOVAL/INSTALLATION.</a> )
		No Replace the instrument cluster.  (See <a href="#">INSTRUMENT CLUSTER REMOVAL/INSTALLATION.</a> )
*4	<b>INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC 2 FOR CONTINUITY</b>	Yes Go to the next step.

	Disconnect the ABS HU/CM connector. <ul style="list-style-type: none"> <li>Is there continuity between connector terminal Z, Y and DLC-2?</li> </ul>	No	Repair the wiring harness between the ABS HU/CM and DLC-2.
*5	<b>INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC 2 FOR SHORT TO B+</b> <ul style="list-style-type: none"> <li>Is the voltage <b>approx. 12V</b> at connector terminal Z, Y?</li> </ul>	Yes	Repair the wiring harness between the ABS HU/CM and DLC-2.
		No	Go to the next step.
*6	<b>INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC 2 FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>Is there continuity between connector terminal Z, Y and ground?</li> </ul>	Yes	Repair the wiring harness between the ABS HU/CM and DLC-2.
		No	Replace the ABS HU/CM (communication circuit malfunction in ABS HU/CM).  (See <a href="#">ABS HU/CM REMOVAL/INSTALLATION.</a> )

### ABS HU/CM WIRING HARNESS-SIDE CONNECTOR

### INSTRUMENT CLUSTER WIRING HARNESS-SIDE CONNECTOR

- When performing an asterisked (\*) troubleshooting inspection, slightly shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, verify that the connectors, terminals and wiring harness are connected correctly and undamaged.



## 2008 - MX-5 - Brakes

### NO.6 BRAKE SYSTEM WARNING LIGHT STAYS ON 4 S OR MORE WHEN IGNITION SWITCH TURNED TO ON POSITION

**6** BRAKE system warning light stays on 4 s or more when the ignition switch is turned to the ON position. (Parking brake is released.)

#### [TROUBLESHOOTING HINTS]

- Malfunction of instrument cluster or ABS HU/CM
- Short to ground in circuit in parking brake switch and/or brake fluid level sensor

#### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT BRAKE FLUID LEVEL</b> <ul style="list-style-type: none"> <li>• Is brake fluid level normal?</li> </ul>	Yes Go to the next step.
		No Add brake fluid.
*2	<b>INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC-2 FOR CONTINUITY AND SHORTS</b> <ul style="list-style-type: none"> <li>• Monitor the one or more items of ABS HU/CM using the M-MDS datalogger function.</li> <li>• Is error message displayed regarding communication between ABS HU/CM and M-MDS?</li> </ul>	Yes If a communication error message is displayed even after inspecting according to procedures displayed on M-MDS. Go to next Step 6.
		No Go to the next step.
3	<b>INSPECT FOR DTCs IN ABS HU/CM</b> <ul style="list-style-type: none"> <li>• Have DTCs been stored in memory?</li> </ul>	Yes Perform the applicable DTC inspection. (See <a href="#">ON-BOARD DIAGNOSIS[ABS]</a> .)
		No Go to the next step.
4	<b>INSPECT WARNING LIGHT OPERATION</b> <ul style="list-style-type: none"> <li>• Turn on the all warning light on instrument cluster using the</li> </ul>	Yes Go to the next step.
		No Replace the instrument cluster.

	<p>instrument cluster input/output check code26.</p> <p>(See <b>INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.</b>)</p> <ul style="list-style-type: none"><li>Does the warning light illuminate?</li></ul>		(See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION.</b> )
5	<p><b>VERIFY WHETHER MALFUNCTION IS IN PARKING BRAKE SWITCH OR BRAKE FLUID LEVEL SENSOR, OR IN SOME OTHER PART</b></p> <ul style="list-style-type: none"><li>Disconnect in the following order:<ol style="list-style-type: none"><li>Parking brake switch connector</li><li>Brake fluid level sensor connector</li></ol></li><li>Does the BRAKE system warning light go out with ignition switch turned to the ON position?</li></ul>	Yes	<p>Replace the parking brake switch and/or brake fluid level sensor (Short with some internal part).</p> <p>(See <b>MASTER CYLINDER REMOVAL/INSTALLATION.</b>)</p> <p>(See <b>PARKING BRAKE LEVER REMOVAL/INSTALLATION.</b>)</p>
		No	<p>Perform the following inspections. Repair if necessary.</p> <ul style="list-style-type: none"><li>Short to ground in the wiring harness between the instrument cluster (BRAKE system warning light) and parking brake switch.</li><li>Short to ground in the wiring harness between the instrument cluster (BRAKE system warning light) and brake fluid level sensor.</li></ul> <p>If inspection results are okay, replace the ABS HU/CM.</p> <p>(See <b>ABS HU/CM REMOVAL/INSTALLATION.</b>)</p>
*6	<p><b>INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC-2 FOR CONTINUITY</b></p> <ul style="list-style-type: none"><li>Disconnect the ABS HU/CM connector.</li><li>Is there continuity between connector terminal Z, Y and DLC-2?</li></ul>	Yes	<p>Go to the next step.</p>
		No	<p>Repair the wiring harness between the ABS HU/CM and DLC-2.</p>
*7	<p><b>INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC-2 FOR SHORT TO B+</b></p> <ul style="list-style-type: none"><li>Is the voltage <b>approx. 12 V</b> at connector terminal Z, Y?</li></ul>	Yes	<p>Repair the wiring harness between the ABS HU/CM and DLC-2.</p>
		No	<p>Go to the next step.</p>
*8	<p><b>INSPECT WIRING HARNESS BETWEEN ABS HU/CM AND DLC-2 FOR SHORT TO GROUND</b></p> <ul style="list-style-type: none"><li>Is there continuity between connector terminal Z, Y and</li></ul>	Yes	<p>Repair the wiring harness between the ABS HU/CM and DLC-2.</p>
		No	<p>Replace the ABS HU/CM (communication circuit</p>

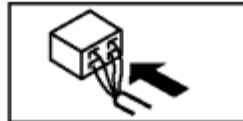
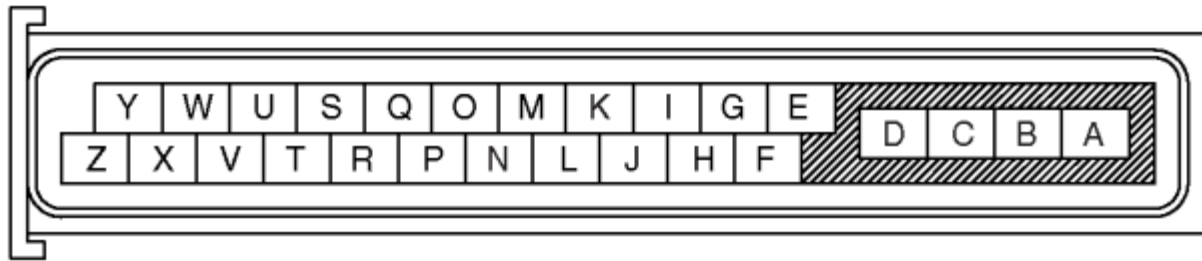


ground?

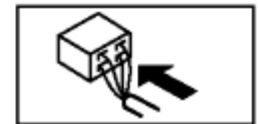
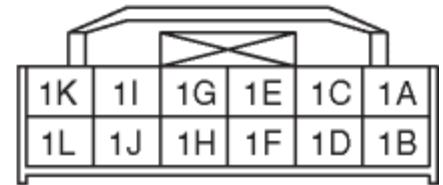
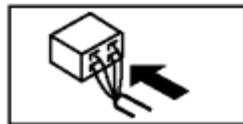
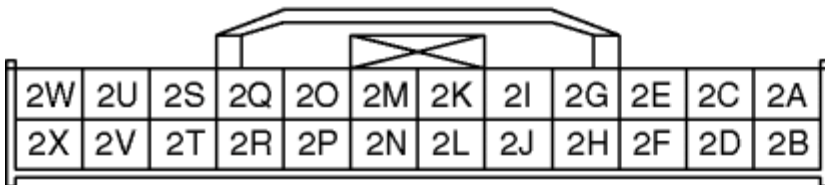
malfunction in ABS HU/CM).

(See [ABS HU/CM REMOVAL/INSTALLATION.](#))

### ABS HU/CM WIRING HARNESS-SIDE CONNECTOR



### INSTRUMENT CLUSTER WIRING HARNESS-SIDE CONNECTOR



- When performing an asterisked (\*) troubleshooting inspection, slightly shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, verify that the connectors, terminals and wiring harness are connected correctly and undamaged.

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## 2008 - MX-5 - Brakes

**NO.7 ANY OF THE FOLLOWING LIGHTS DO NOT ILLUMINATE WHEN IGNITION SWITCH TURNED TO ON POSITION: (ABS WARNING LIGHT, BRAKE SYSTEM WARNING LIGHT, DSC INDICATOR LIGHT AND/OR DSC OFF LIGHT)**

Any of the following lights do not illuminate when the ignition switch is turned to the ON position: (ABS warning light, BRAKE system warning light, DSC indicator light and/or DSC OFF light).	
<b>[TROUBLESHOOTING HINTS]</b> <ul style="list-style-type: none"> <li>• Inspect each light in the instrument cluster for malfunction</li> <li>• Poor connection at DSC HU/CM connector</li> </ul>	

### Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>INSPECT FOR DTCS IN DSC HU/CM</b> <ul style="list-style-type: none"> <li>• Inspect the DTC for the DSC ON-BOARD DIAGNOSTIC SYSTEM.</li> <li>• Have DTCs been stored in memory?</li> </ul>	Yes	Perform the applicable DTC inspection.  (See <b>ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</b> .)
		No	Go to the next step.
2	<b>INSPECT WHETHER MALFUNCTION IS IN INSTRUMENT CLUSTER SYSTEM OR OTHER SYSTEM</b> <ul style="list-style-type: none"> <li>• Do other warning and indicator lights illuminate when the ignition switch is turned to the ON position?</li> </ul>	Yes	Go to the next step.
		No	Inspect or repair the instrument cluster (power supply system, ground system).
3	<b>VERIFY THAT DSC HU/CM CONNECTOR IS CONNECTED</b> <ul style="list-style-type: none"> <li>• Is the DSC HU/CM securely connected?</li> </ul>	Yes	Go to the next step.
		No	Connect the DSC HU/CM connector securely, then go to the next step.
4	<b>VERIFY THAT DSC HU/CM CONNECTOR TERMINAL OR RELATED CONNECTOR TERMINALS ARE CONNECTED</b>	Yes	Replace the DSC HU/CM.

	<ul style="list-style-type: none"><li>• Are DSC HU/CM connector terminal, instrument cluster connector terminal, or related connector terminals securely connected?</li></ul>		(See <a href="#">DSC HU/CM REMOVAL/INSTALLATION.</a> )
		No	Securely connect DSC HU/CM connector terminal and related connector terminals.

## 2008 - MX-5 - Brakes

**NO.8 ANY OF THE FOLLOWING LIGHTS REMAIN ON: (ABS WARNING LIGHT, BRAKE SYSTEM WARNING LIGHT, DSC INDICATOR LIGHT AND/OR DSC OFF LIGHT)**

8 Any of the following lights remain on: (ABS warning light, BRAKE system warning light, DSC indicator light and/or DSC OFF light)

### [TROUBLESHOOTING HINTS]

- Brake fluid amount is low
- Parking brake does not release
- No connection at DSC HU/CM connector  
(When DSC HU/CM connector is disconnected, ABS warning light and BRAKE system warning light illuminate)
- DSC HU/CM detected malfunction (Input and output device malfunction)
- DSC HU/CM detects low voltage in power supply
- DSC HU/CM ground malfunction  
(When DSC HU/CM ground is not securely connected, ABS warning light and BRAKE system warning light illuminate but diagnostic trouble code does not displayed)
- DSC HU/CM does not operate (DSC HU/CM malfunction)

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT BRAKE FLUID AMOUNT AND VERIFY THAT PARKING BRAKE RELEASES</b> <ul style="list-style-type: none"> <li>• Is the brake fluid amount normal?</li> <li>• Is the parking brake lever released?</li> </ul>	Yes Go to the next step.
		No Add brake fluid or release parking brake lever.
2	<b>INSPECT DTCS IN DSC HU/CM</b> <ul style="list-style-type: none"> <li>• Inspect the DTC for the DSC ON-BOARD DIAGNOSTIC SYSTEM.</li> <li>• Have DTCs been stored in memory?</li> </ul>	Yes Perform inspection using appropriate DTC.  (See <b>ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</b> .)

		No	Go to the next step.
3	<b>INSPECT WHETHER MALFUNCTION IS IN CONTROL MODULE CONNECTOR, TERMINAL OR OTHER</b> <ul style="list-style-type: none"> <li>Do the ABS warning light and BRAKE system warning light go out after <b>4 s</b> when the ignition switch is turned to the ON position?</li> </ul>	Yes	Temporary poor connection in control module connector.  Inspect DSC HU/CM connector, then go to Step 6.  Inspect DSC HU/CM connector terminal, then go to Step 7.
		No	Go to the next step.
4	<b>INSPECT BATTERY</b> <ul style="list-style-type: none"> <li>Is the battery voltage normal?</li> </ul>	Yes	Go to the next step.
		No	Inspect the battery and charging system.  (See <b>BATTERY INSPECTION [LF].</b> )  (See <b>GENERATOR INSPECTION [LF].</b> )
5	<b>INSPECT CHARGING SYSTEM</b> <ul style="list-style-type: none"> <li>Is the battery voltage normal with electrical load (A/C, headlight, etc.) on and engine idling?</li> </ul>	Yes	Go to the next step.
		No	Inspect the charging system (drive belt tension, generator, etc.).  (See <b>GENERATOR INSPECTION [LF].</b> )
6	<b>VERIFY THAT DSC HU/CM CONNECTOR IS CONNECTED</b> <ul style="list-style-type: none"> <li>Is the DSC HU/CM securely connected?</li> </ul>	Yes	Go to the next step.
		No	Connect the DSC HU/CM connector securely, then go to the next step.
7	<b>VERIFY THAT DSC HU/CM CONNECTOR TERMINAL OR RELATED CONNECTOR TERMINALS ARE CONNECTED</b> <ul style="list-style-type: none"> <li>Are the DSC HU/CM connector terminal or instrument cluster connector terminal etc. related connector terminals securely connected?</li> </ul>	Yes	Replace the DSC HU/CM.  (See <b>DSC HU/CM REMOVAL/INSTALLATION.</b> )
		No	Securely connect the DSC HU/CM connector terminal and related connector terminals.



2008 - MX-5 - Brakes

NO.9 THERE IS A MALFUNCTION IN THE SYSTEM EVEN THOUGH ABS WARNING LIGHT, BRAKE SYSTEM WARNING LIGHT, DSC INDICATOR LIGHT AND DSC OFF LIGHT DO NOT ILLUMINATE

9

There is a malfunction in the system even though the ABS warning light, BRAKE system warning light, DSC indicator light and DSC OFF light do not illuminate.

[TROUBLESHOOTING HINTS]

- There is a mechanical malfunction in system

Diagnostic procedure

STEP	INSPECTION		ACTION
1	<b>INSPECT DSC HU/CM FOR DTCs</b> <ul style="list-style-type: none"><li>• Inspect the DTC for the DSC ON-BOARD DIAGNOSTIC SYSTEM.</li><li>• Have DTCs been stored in memory?</li></ul>	Yes	Perform the applicable DTC inspection. (See <b>ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</b> .)
		No	Go to the next step.
2	<b>INSPECT DSC SYSTEM</b> <ul style="list-style-type: none"><li>• Perform DSC system inspection. (See <b>DSC SYSTEM INSPECTION</b>.)</li><li>• Is the system normal?</li></ul>	Yes	Inspect the conventional brake system.
		No	Repair or replace any malfunctioning part.

## 2008 - MX-5 - Brakes

### NO.11 DSC(\*2) OPERATES FREQUENTLY/DSC DOES NOT WORK CORRECTLY\*2: DSC INDICATOR LIGHT GOES ON AND OFF WHILE DSC IS OPERATING

11	<p>DSC (*2) operates frequently. /DSC does not work correctly.</p> <p>(*2): DSC indicator light goes on and off while DSC is operating.</p>
<p><b>[TROUBLESHOOTING HINTS]</b></p> <ul style="list-style-type: none"> <li>DSC HU/CM detected malfunction (input and output device malfunction)</li> <li>Poor installation of yaw rate sensor, lateral-G sensor and/or steering angle sensor</li> </ul> <p>(If any of the above sensors are poorly installed, DSC may operate intermittently)</p> <ul style="list-style-type: none"> <li>When replacing the DSC HU/CM, combined sensor or steering angle sensor, initialization is not performed.</li> </ul> <p>(If initialization is not performed correctly, DSC may not work correctly)</p>	

#### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<p><b>INSPECT DSC HU/CM FOR DTCs</b></p> <ul style="list-style-type: none"> <li>Inspect the DTC for the DSC ON-BOARD DIAGNOSTIC SYSTEM.</li> <li>Have DTCs been recorded in memory?</li> </ul>	<p>Yes Perform the applicable DTC inspection. (See <b>ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</b>.)</p> <p>No Go to the next step.</p>
2	<p><b>VERIFY THAT EACH SENSOR IS INSTALLED</b></p> <ul style="list-style-type: none"> <li>Are the combined sensor and steering angle sensor securely installed?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Install sensor securely.</p>
*3	<p><b>VERIFY THAT EACH SENSOR IS INITIALIZED</b></p> <ul style="list-style-type: none"> <li>Was initialization performed after replacement of the DSC HU/CM, combined sensor or steering angle sensor?</li> </ul>	<p>Yes Find malfunctioning part according to "INTERMITTENT CONCERN TROUBLESHOOTING."</p> <p>No Perform initialization procedure.</p>



		(See <b>COMBINED SENSOR INITIALIZATION PROCEDURE.</b> )
		(See <b>STEERING ANGLE SENSOR INITIALIZATION PROCEDURE.</b> )

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2008 - MX-5 - Brakes

**NO.10 ABS OR TCS\*1 OPERATES FREQUENTLY/TCS DOES NOT WORK CORRECTLY\*1: DSC SYSTEM FUNCTION CONTAINS TRACTION CONTROL FUNCTION, DSC INDICATOR LIGHT GOES ON AND OFF WHILE TCS IS OPERATING**

ABS or TCS (*1) operates frequently./TCS does not work correctly.	
10	(*1): DSC system function contains traction control function; DSC indicator light goes on and off while TCS is operating.
<b>[TROUBLESHOOTING HINTS]</b> <ul style="list-style-type: none"><li>• There is a difference in size or air pressure between the front and rear tires</li><li>• Incorrect ABS wheel-speed signal is input to DSC HU/CM</li><li>• There is a malfunction in the engine control system (TCS malfunction)</li></ul>	

Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>INSPECT DTCS IN DSC HU/CM</b> <ul style="list-style-type: none"><li>• Inspect the DTC for the DSC ON-BOARD DIAGNOSTIC SYSTEM.</li><li>• Have DTCs been stored in memory?</li></ul>	Yes	Perform the applicable DTC inspection.  (See <b>ON-BOARD DIAGNOSIS[DYNAMIC STABILITY CONTROL (DSC)]</b> .)
		No	Go to the next step.
2	<b>INSPECT TIRE SIZE AND AIR PRESSURE</b> <ul style="list-style-type: none"><li>• Inspect the tire size and the air pressure.</li><li>• Are size and air pressure as specified?</li></ul>	Yes	Go to the next step.
		No	Replace with specified tires and adjust tire air pressure.

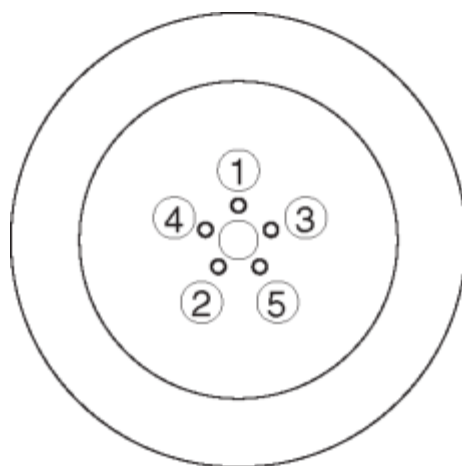
3	<b>INSPECT ABS WHEEL-SPEED SENSOR OUTPUT VALUE</b> <ul style="list-style-type: none"> <li>Inspect the output value from the ABS wheel-speed sensor.</li> </ul> <p>(See <b>FRONT ABS WHEEL-SPEED SENSOR INSPECTION.</b>)</p> <p>(See <b>REAR ABS WHEEL-SPEED SENSOR INSPECTION.</b>)</p> <ul style="list-style-type: none"> <li>Is the output value normal?</li> </ul>		<div>YesFind that malfunctioning part according to "INTERMITTENT CONCERN TROUBLESHOOTING".</div> <div>No <ul style="list-style-type: none"> <li>ABS wheel-speed sensor installation inspection: <p>Inspect the sensor for looseness and verify that it is securely installed.</p> </li> <li>Sensor rotor installation inspection: <p>Inspect the sensor rotor for poor installation and chipping of sensor rotor teeth. (If sensor rotor is installed poorly, it may cause output of abnormal wave form at high speed.)</p> </li> </ul> </div>
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## 2008 - MX-5 - Brakes

### GENERAL PROCEDURES (BRAKE)

#### Wheel and Tire Installation

1. When installing the wheels and tires, tighten the wheel nuts in a criss-cross pattern to the following tightening torque.



#### Tightening torque

- 88—118 N·m { 9.0—12.0 Kgf·m, 65.0—87.0 ft·lbf }

#### Brake Lines Disconnection

1. If any brake line has been disconnected anytime during the procedures, add brake fluid, bleed the brakes, and inspect for leakage after the procedure has been completed.

#### CAUTION:

- Brake fluid will damage painted surfaces. Be careful not to spill any on painted surfaces. If it is spilled, wipe it off immediately.

#### Brake Pipe Flare Nut Tightening

1. Tighten the brake pipe flare nut using the commercially available flare nut wrench.

#### Connector Disconnection

1. Disconnect the negative battery cable before performing any work that requires handling of

connectors. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)

## ABS/DSC Related Parts

1. Make sure that there are no DTCs in the ABS/DSC memory after working on ABS/DSC related parts. If there are any codes in the memory, clear them.

## DSC Related Part Sensor Initialization Procedure

### WARNING:

- If the initialization procedure is not completed, the DSC will not operate properly and it might cause an unexpected accident. Therefore, when replacing or removing the following parts, make sure to perform the initialization procedure to insure proper DSC operation.

1. When replacing or removing the following parts, perform the initialization procedure. (See [COMBINED SENSOR INITIALIZATION PROCEDURE](#).) (See [STEERING ANGLE SENSOR INITIALIZATION PROCEDURE](#).) (See [STEERING ANGLE SIGNAL INITIALIZATION PROCEDURE](#).)

- DSC HU/CM
- Combined sensor
- Steering angle sensor

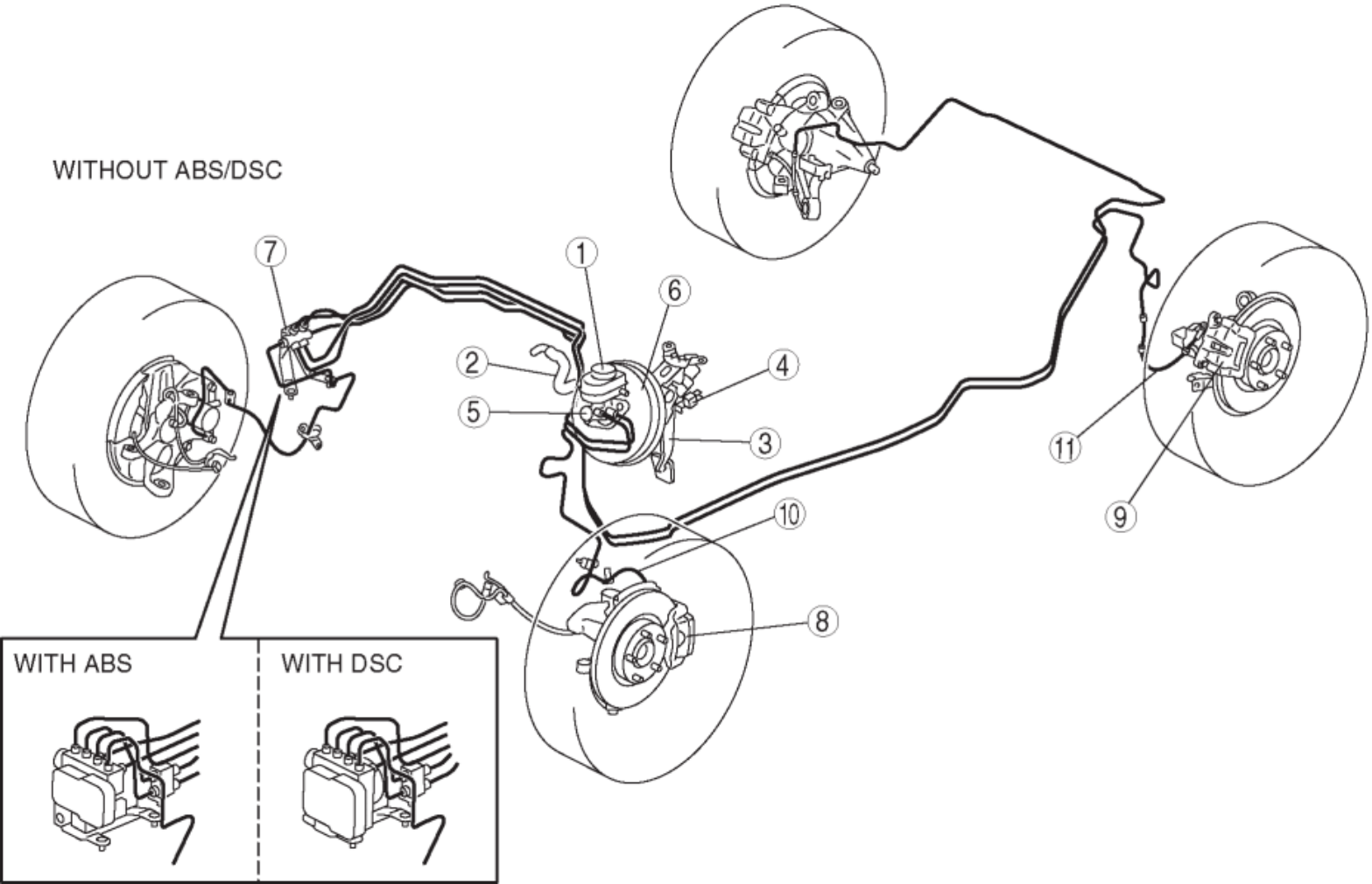
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2008 - MX-5 - Brakes

CONVENTIONAL BRAKE SYSTEM LOCATION INDEX



1	Brake fluid (See <a href="#">AIR BLEEDING.</a> )
2	Vacuum line (See <a href="#">VACUUM LINE INSPECTION.</a> )
3	Brake pedal (See <a href="#">BRAKE PEDAL INSPECTION.</a> ) (See <a href="#">BRAKE PEDAL REMOVAL/INSTALLATION.</a> )
4	Brake switch (See <a href="#">BRAKE SWITCH INSPECTION.</a> )

5	Master cylinder  (See <a href="#">MASTER CYLINDER REMOVAL/INSTALLATION.</a> )  (See <a href="#">BRAKE FLUID LEVEL SENSOR INSPECTION.</a> )
6	Power brake unit  (See <a href="#">POWER BRAKE UNIT INSPECTION.</a> )  (See <a href="#">POWER BRAKE UNIT REMOVAL/INSTALLATION.</a> )
7	Dual proportioning valve  (See <a href="#">DUAL PROPORTIONING VALVE INSPECTION.</a> )  (See <a href="#">DUAL PROPORTIONING VALVE REMOVAL/INSTALLATION.</a> )
8	Front brake (disc)  (See <a href="#">FRONT BRAKE (DISC) INSPECTION.</a> )  (See <a href="#">FRONT BRAKE (DISC) REMOVAL/INSTALLATION.</a> )  (See <a href="#">DISC PAD (FRONT) REPLACEMENT.</a> )  (See <a href="#">CALIPER (FRONT) DISASSEMBLY/ASSEMBLY.</a> )
9	Rear brake (disc)  (See <a href="#">REAR BRAKE (DISC) INSPECTION.</a> )  (See <a href="#">REAR BRAKE (DISC) REMOVAL/INSTALLATION.</a> )  (See <a href="#">DISC PAD (REAR) REPLACEMENT.</a> )  (See <a href="#">CALIPER (REAR) DISASSEMBLY/ASSEMBLY.</a> )
10	Brake hose (front)  (See <a href="#">BRAKE HOSE (FRONT) REMOVAL/INSTALLATION.</a> )
11	Brake hose (rear)  (See <a href="#">BRAKE HOSE (REAR) REMOVAL/INSTALLATION.</a> )

## 2008 - MX-5 - Brakes

### AIR BLEEDING

#### CAUTION:

- Brake fluid will damage painted surfaces. Be careful not to spill any on painted surfaces. If it is spilled, wipe it off immediately.
- During air bleeding, brake fluid could splatter out from the brake fluid reserve tank and cause damage to the painted surfaces. When performing air bleeding, always perform it with the brake fluid reserve tank filter set to prevent brake fluid from splattering.

#### NOTE:

- Keep the fluid level in the reserve tank at 3/4 full or more during the air bleeding.
- Begin air bleeding with the master cylinder and then continue with the brake caliper that is furthest away from the master cylinder. Finish by bleeding air from the master cylinder again.

#### Brake fluid type

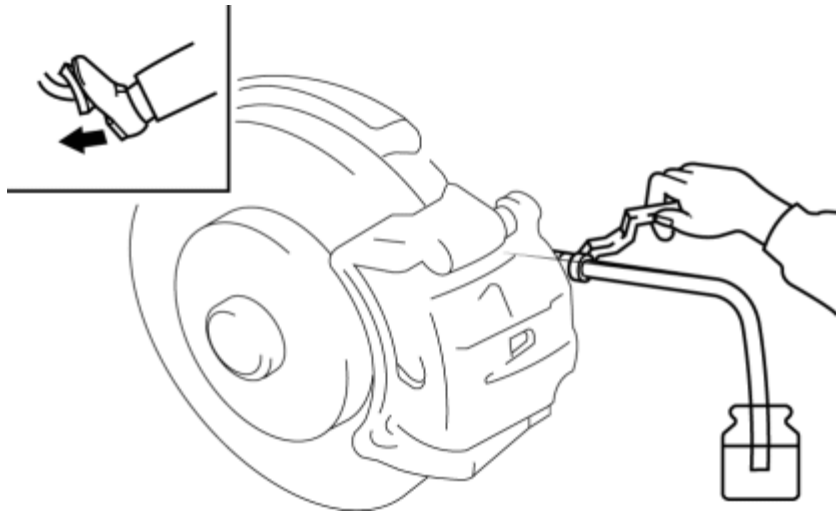
- SAE J1703, FMVSS 116 DOT-3

1. Remove the cap from the brake fluid reserved tank and add brake fluid.
2. Remove the bleeder cap from the brake caliper, and connect a vinyl tube to the bleeder screw.
3. Place the other end of the vinyl tube in a clear container, and fill the container with fluid during air bleeding.
4. Working with two people, one should depress the brake pedal a few times and then depress and hold the pedal down.
5. While the brake pedal is being held down, the other person should loosen the bleeder screw using a commercially available flare nut wrench, and bleed any fluid containing air bubbles. Once completed, tighten the bleeder screw.

#### Tightening torque

- Front: 6.9—9.8 N·m {71—99 Kgf·cm, 62—86 in·lbf}
- Rear: 6.0—8.0 N·m {62—81 Kgf·cm, 54—70 in·lbf}





6. Repeat Steps 3 and 4 until no air bubbles are seen.
7. Perform air bleeding as described in the above procedures for all brake calipers.
8. After air bleeding, inspect the following:
  - Brake operation
  - Fluid leakage
  - Fluid level

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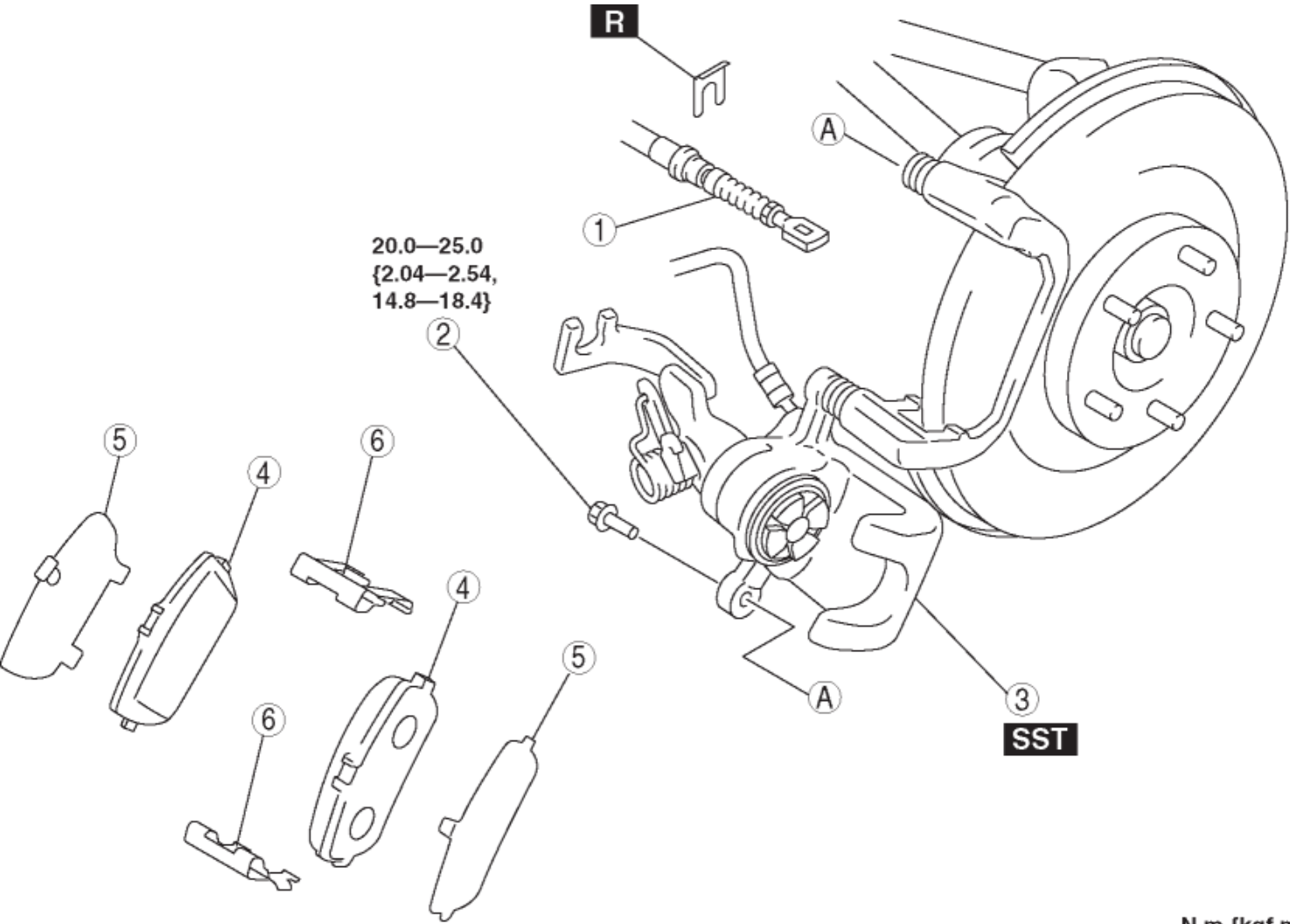
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2008 - MX-5 - Brakes

DISC PAD (REAR) REPLACEMENT

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. After installation, depress the brake pedal a few times, and inspect the following.
  - The disc pad projection is securely installed to the piston groove
  - Parking brake lever stroke
  - Brake drag



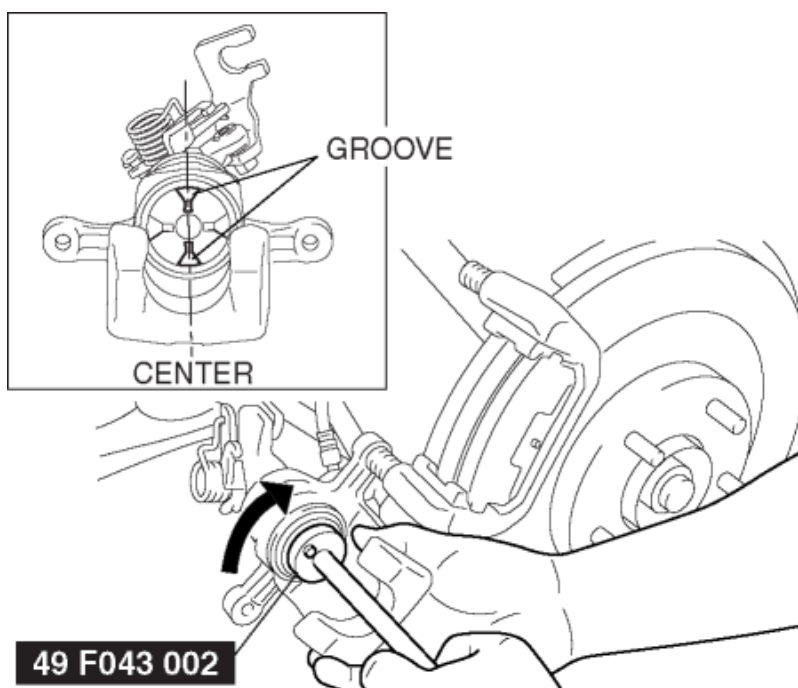
N·m {kgf·m, ft·lbf}

1	Parking brake cable
	(See <a href="#">REAR BRAKE (DISC) REMOVAL/INSTALLATION.</a> )

2 Bolt	
3 Caliper	
(See <a href="#">Caliper Installation Note.</a> )	
4 Disc pad	
5 Shim	
6 Guide plate	

## Caliper Installation Note

1. Clean the exposed area of the piston.
2. Rotate the piston clockwise slowly using the **SST** and push in the piston completely until the piston grooves are in the position shown in the figure.



3. Install the caliper.

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## 2008 - MX-5 - Brakes

### REAR BRAKE (DISC) INSPECTION

#### Brake Judder Repair Hints

##### Description

1. Brake judder concern has the following 3 characteristics:

##### Steering wheel vibration

1. Steering wheel vibrates in the rotation direction. This characteristic is most noticeable when applying brakes at a vehicle speed of **100—140 km/h {62.1—86.8 mph}**.

##### Floor vibration

1. When applying the brakes, the vehicle body shakes back and forth. The seriousness of the shaking is not influenced by vehicle speed.

##### Brake pedal vibration

1. When applying brakes, a pulsating force tries to push the brake pad back. The pulsation is transmitted to the brake pedal.
2. The following are the main possible causes of brake judder:

##### Due to an excessive runout (side-to-side wobble) of the disc plate, the thickness of the disc plate is uneven.

1. If the runout is **more than 0.05 mm {0.002 in}** at the position **10 mm {0.39 in}** from the disc plate edge, uneven wear occurs on the disc plate because the pad contacts the plate unevenly.
2. If the runout is **less than 0.05 mm {0.002 in}**, uneven wear does not occur.

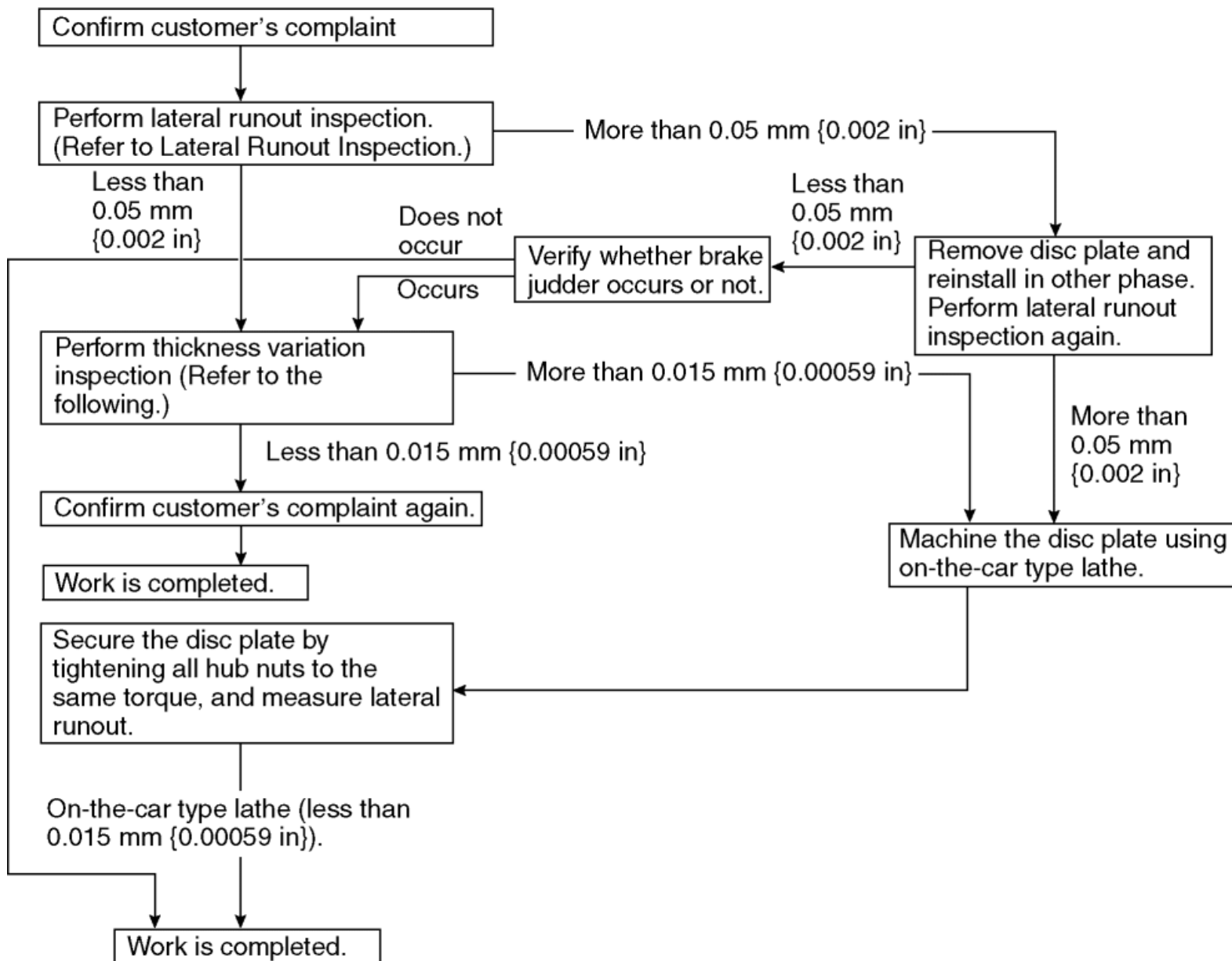
##### The disc plate is deformed by heat.

1. Repeated panic braking may raise the temperature in some portions of disc plate by **approx. 1,000 °C {1,832 °F}**. This results in a deformed disc plate.

##### Due to corrosion, the thickness and friction coefficient of disc plate change.

1. If a vehicle is parked in damp conditions for a long time, corrosion occurs on the friction surface of disc plate.
2. The thickness of corrosion is uneven and sometimes appears like a wave pattern, which changes the friction coefficient and causes a reaction force.

##### Inspection and repair procedure



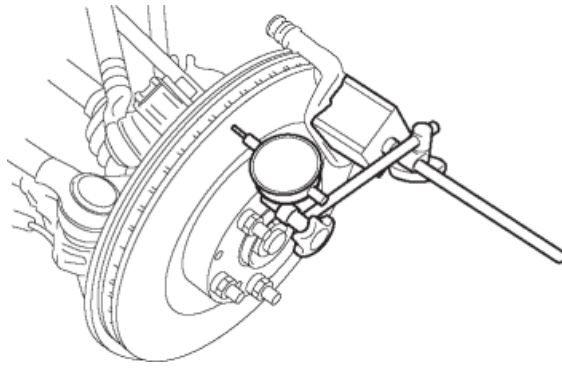
#### Lateral runout inspection

1. To secure the disc plate and the hub, insert the washer (thickness **10 mm {0.39 in}**, inner diameter **more than 12 mm {0.47 in}**) between each hub bolt and the hub nut, then tighten all the hub nuts.

#### NOTE:

- The component parts of the **SST** (49 B017 001 or 49 G019 003) can be used as a suitable washer.

2. After tightening all the hub nuts to the same torque, put the dial gauge on the friction surface of disc plate **10 mm {0.39 in}** from the disc plate edge.



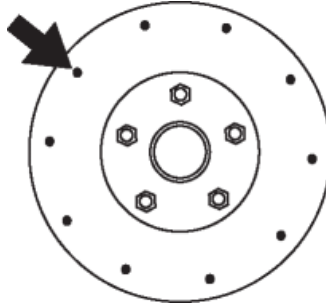
3. Rotate the disc plate one time and measure the runout.

#### **Rear disc plate runout limit**

- 0.05 mm {0.002 in}

#### **Thickness variation inspection**

1. Clean the disc plate-to-pad friction surface using a brake cleaner.
2. Measure the points indicated in the illustration using a caliper (micrometer).



3. Subtract the minimum value from the maximum, and if the result is not within specification, machine the disc plate using a lathe.

#### **Thickness variation limit**

- 0.015 mm {0.00059 in}

#### **WARNING:**

- Do not exceed minimum disc plate thickness.

### **Disc Plate Thickness Inspection**

#### **CAUTION:**

- Excessive runout may result if the disc plate is removed from the vehicle then machined. Machine the disc plate while installed on the vehicle.

1. Measure the thickness of the disc plate.

- If the thickness is not within the specification, replace the disc plate.

#### **Minimum rear disc plate thickness**

- 8 mm {0.31 in}

#### **Minimum rear disc plate thickness after machining using a brake lathe on-vehicle**

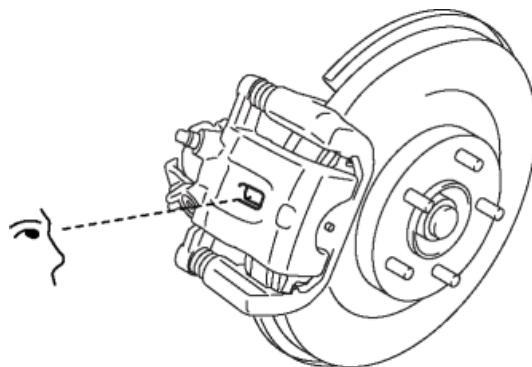
- 8.8 mm {0.35 in}

### **Disc Pad Thickness Inspection**

1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the wheel and tires.
3. Verify the remaining thickness of the pads.

**Minimum rear disc pad thickness**

- 2.0 mm {0.079 in} min.
4. Replace the pads as a set (right and left wheels) if either one is at or less than the minimum thickness.



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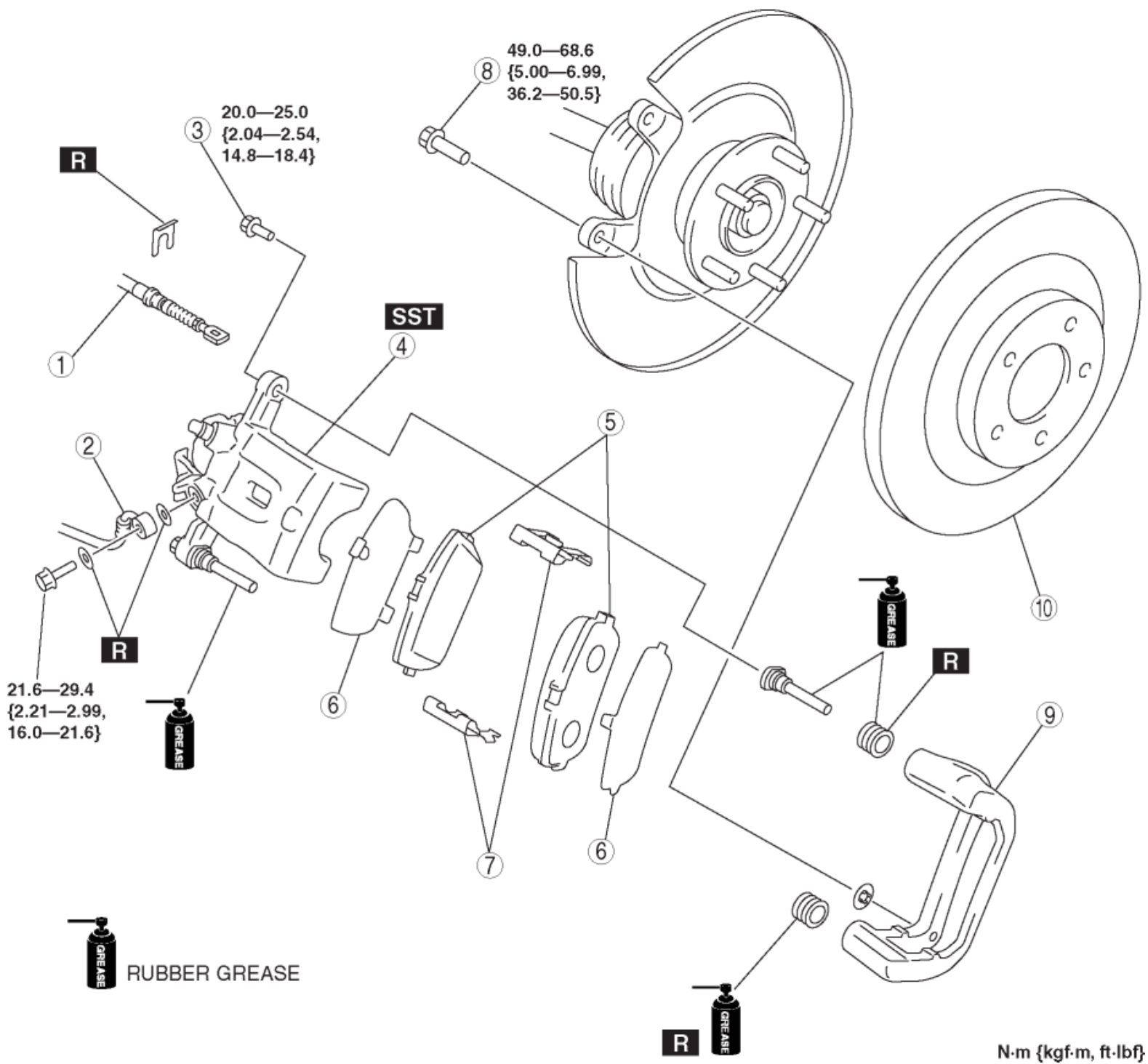
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## 2008 - MX-5 - Brakes

### REAR BRAKE (DISC) REMOVAL/INSTALLATION

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. After installation, depress the brake pedal a few times, and inspect the following.
  - The disc pad projection is securely installed to the piston groove
  - Parking brake lever stroke
  - Brake drag



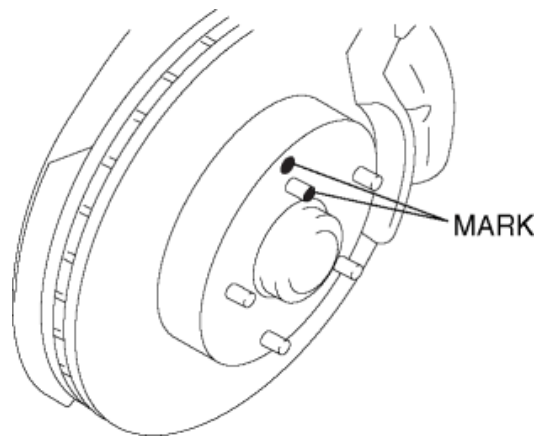


1	Parking brake cable (See <a href="#">Parking Brake Cable Installation Note.</a> )
2	Brake hose
3	Bolt
4	Caliper (See <a href="#">Caliper Installation Note.</a> )

5	Disc pad
6	Shim
7	Guide plate
8	Bolt
9	Mounting support
10	Disc plate
	(See <a href="#">Disc Plate Removal Note.</a> )
	(See <a href="#">Disc Plate Installation Note.</a> )

**Disc Plate Removal Note**

- 1. Mark the wheel hub and disc plate.



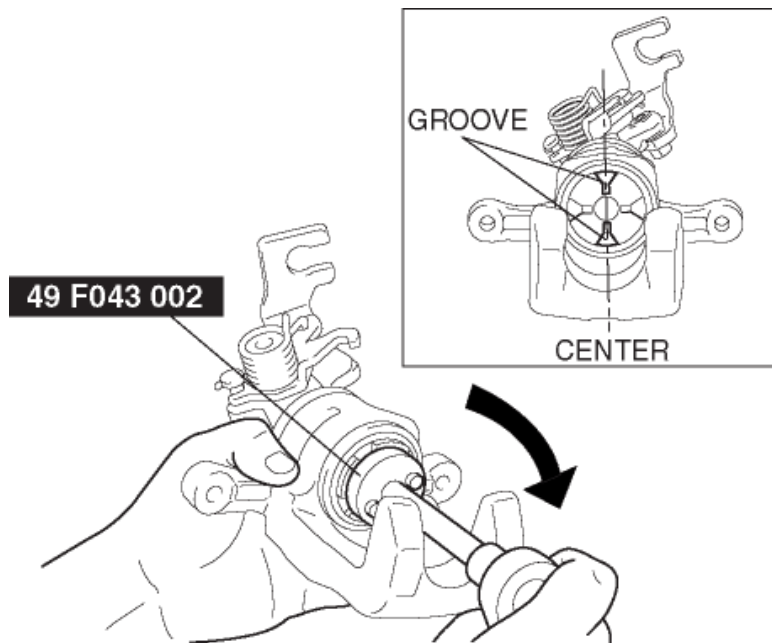
- 2. Remove the disc plate.

**Disc Plate Installation Note**

- 1. Remove any rust or foreign material from the wheel hub and disc plate.
- 2. Align the marks made before removal and install the disc plate to the wheel hub.

**Caliper Installation Note**

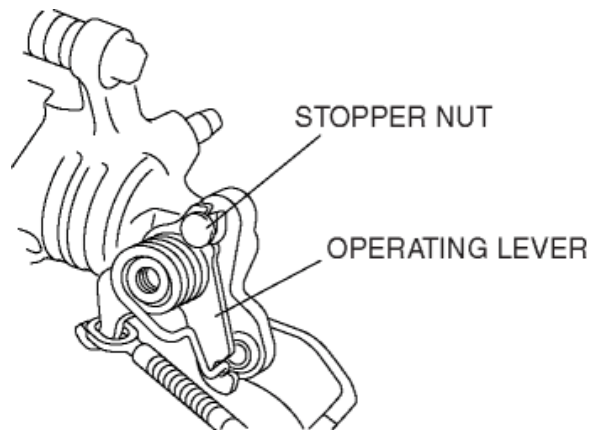
- 1. Clean the exposed area of the piston.
- 2. Rotate the piston clockwise slowly using the **SST** and push the piston completely until the piston grooves are in the position shown in the figure.



3. Install the caliper.

#### Parking Brake Cable Installation Note

1. After installing the parking brake cable, verify that the operating lever returns to the stopper nut with the parking brake lever released.



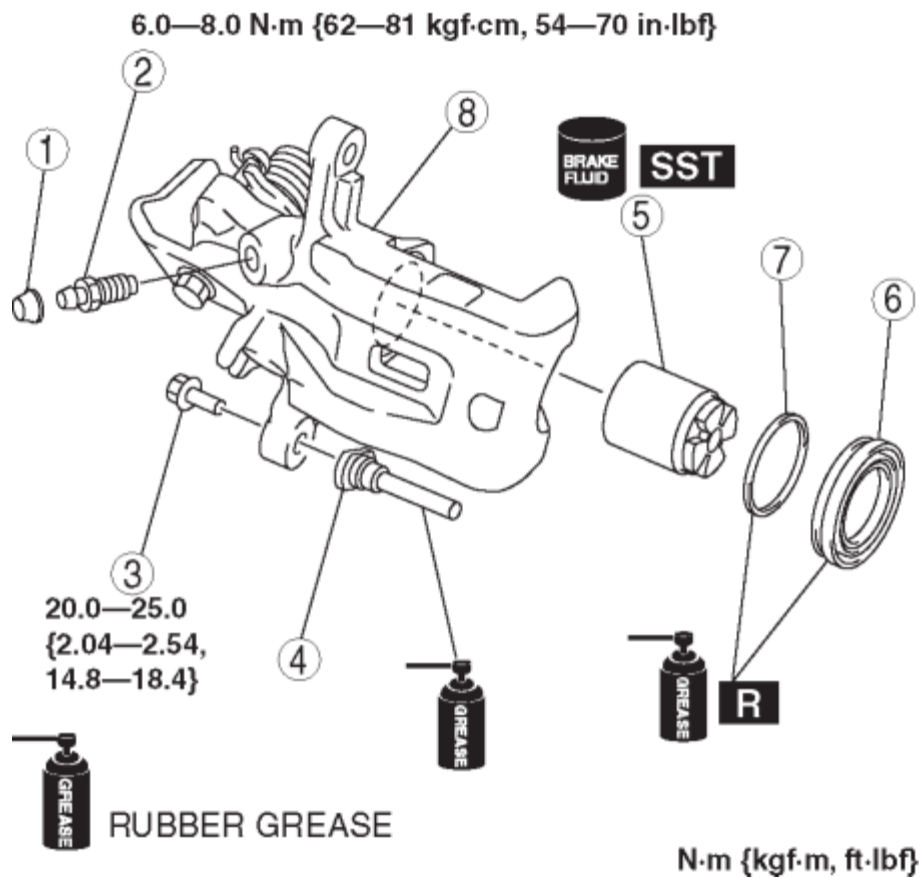
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2008 - MX-5 - Brakes

CALIPER (REAR) DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.



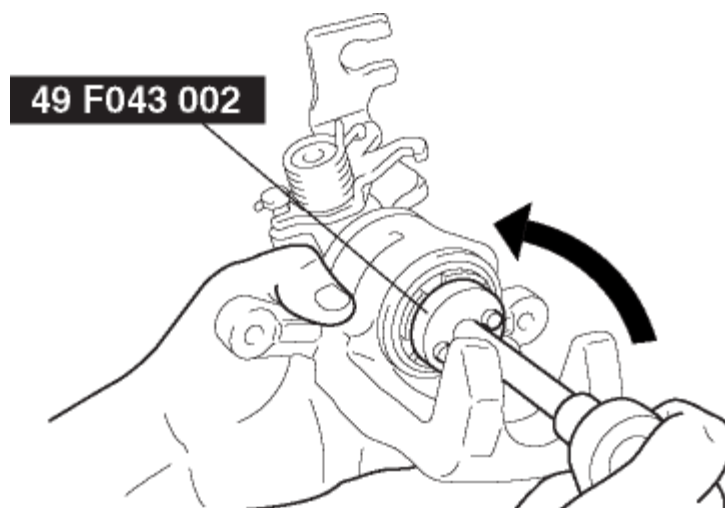
1	Bleeder cap
2	Bleeder screw
3	Bolt
4	Sleeve
5	Piston
	(See <a href="#">Piston Disassembly Note.</a> )
	(See <a href="#">Dust Seal, Piston Assembly Note.</a> )

6	Dust seal
	(See <b>Dust Seal, Piston Assembly Note.</b> )
7	Piston seal
8	Caliper body

2. Assemble in the reverse order of disassembly.

### Piston Disassembly Note

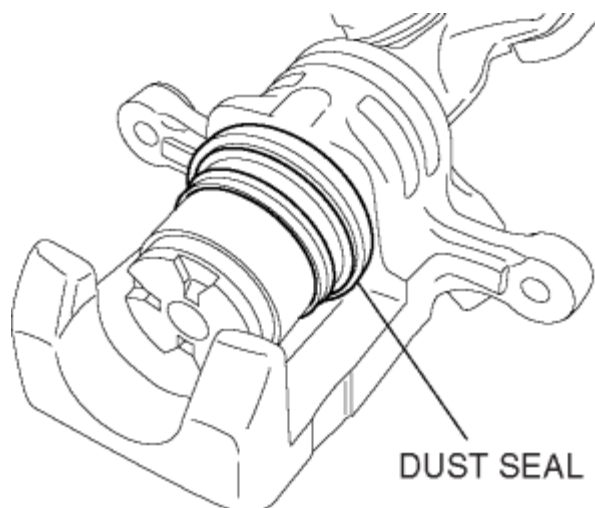
1. Rotate the piston counter-clockwise using the **SST**, remove the piston from the caliper body.



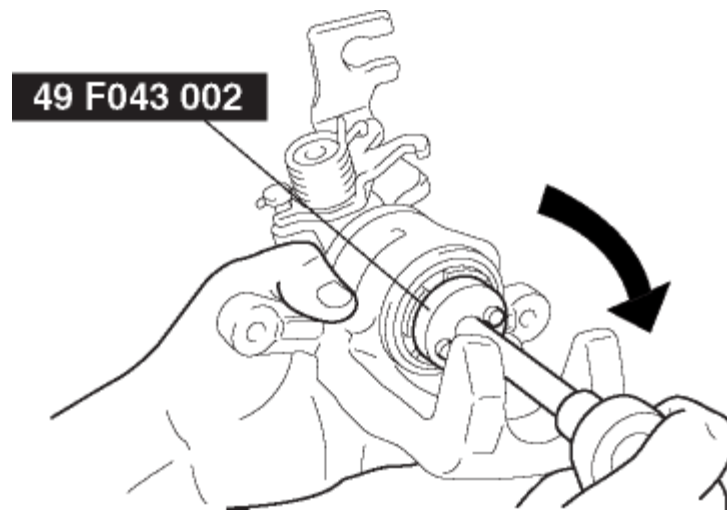
### Dust Seal, Piston Assembly Note

1. Assemble the dust seal to the piston.

2. Assemble the lip of the dust seal to the groove of the caliper body with the dust seal is assembled to the piston as shown in the figure.



3. Rotate the piston clockwise using the **SST** slowly and push the piston inwards completely.



4. Verify that the dust seal is installed into the groove of the piston securely.

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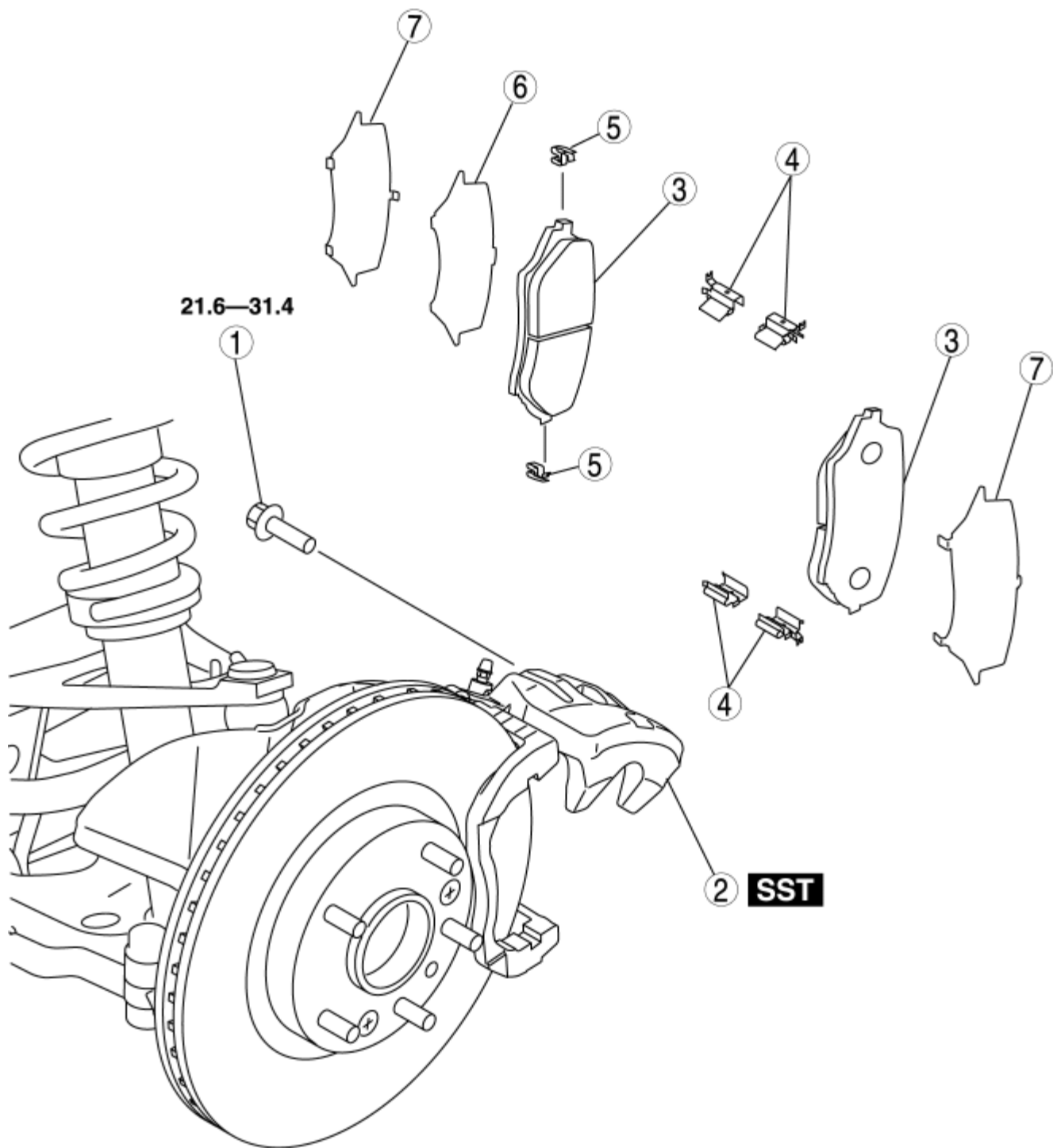
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## 2008 - MX-5 - Brakes

### DISC PAD (FRONT) REPLACEMENT

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. After installation, depress the brake pedal a few times, then verify that the brakes do not drag.



N·m

1	Bolt
2	Caliper (See <b>FRONT BRAKE (DISC) REMOVAL/INSTALLATION.</b> )
3	Disc pad



4	Guide plate
5	Pad wear indicator
6	Floating shim
7	Shim

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## 2008 - MX-5 - Brakes

### FRONT BRAKE (DISC) INSPECTION

#### Brake Judder Repair Hints

##### Description

1. Brake judder concern has the following 3 characteristics:

##### Steering wheel vibration

1. Steering wheel vibrates in the rotation direction. This characteristic is most noticeable when applying brakes at a vehicle speed of **100—140 km/h {62.1—86.8 mph}**.

##### Floor vibration

1. When applying the brakes, the vehicle body shakes back and forth. The seriousness of the shaking is not influenced by vehicle speed.

##### Brake pedal vibration

1. When applying brakes, a pulsating force tries to push the brake pad back. The pulsation is transmitted to the brake pedal.
2. The following are the main possible causes of brake judder:

##### Due to an excessive runout (side-to-side wobble) of the disc plate, the thickness of the disc plate is uneven.

1. If the runout is **more than 0.05 mm {0.002 in}** at the position **10 mm {0.39 in}** from the disc plate edge, uneven wear occurs on the disc plate because the pad contacts the plate unevenly.
2. If the runout is **less than 0.05 mm {0.002 in}**, uneven wear does not occur.

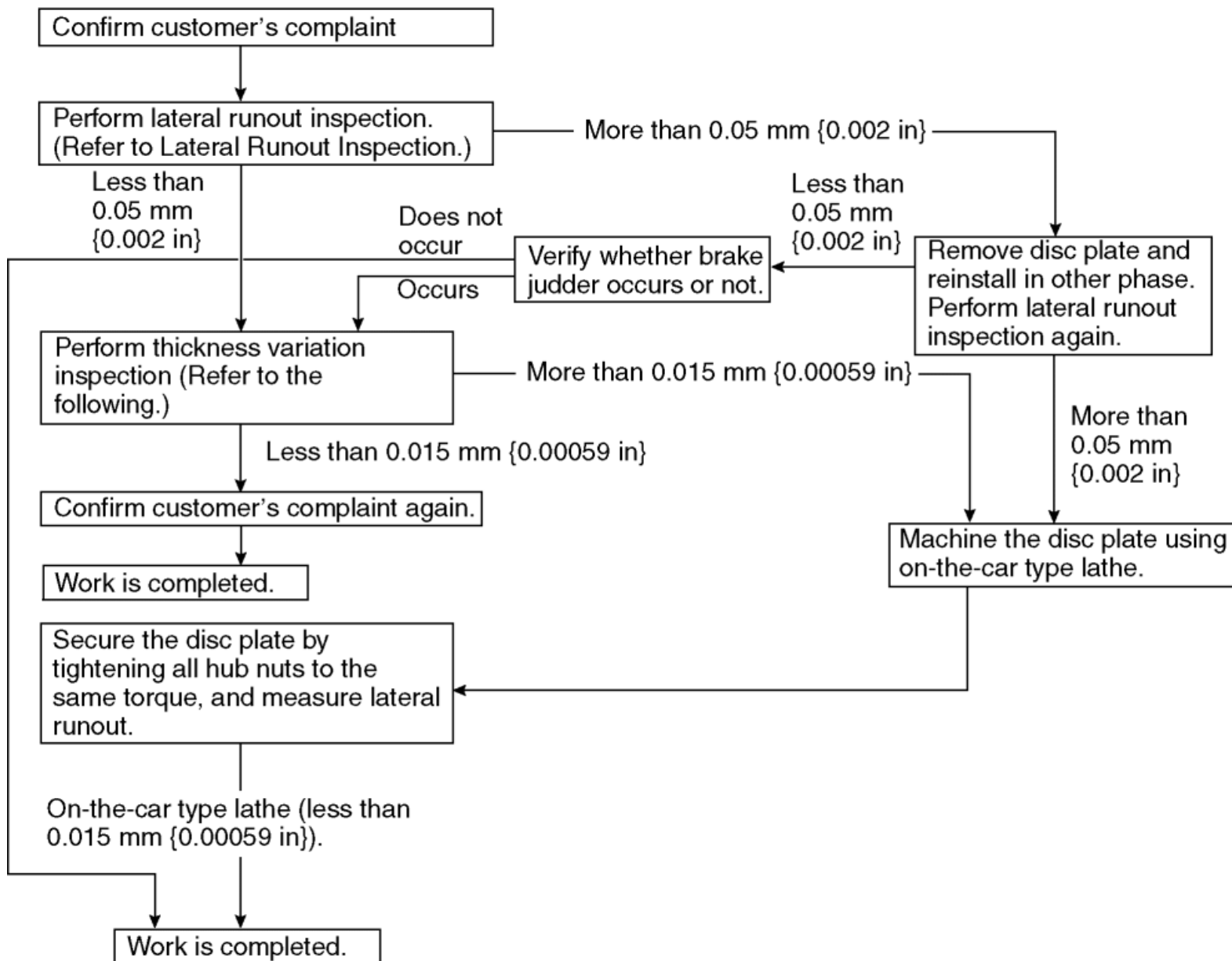
##### The disc plate is deformed by heat.

1. Repeated panic braking may raise the temperature in some portions of disc plate by **approx. 1,000 °C {1,832 °F}**. This results in a deformed disc plate.

##### Due to corrosion, the thickness and friction coefficient of disc plate change.

1. If a vehicle is parked in damp conditions for a long time, corrosion occurs on the friction surface of disc plate.
2. The thickness of corrosion is uneven and sometimes appears like a wave pattern, which changes the friction coefficient and causes a reaction force.

##### Inspection and repair procedure



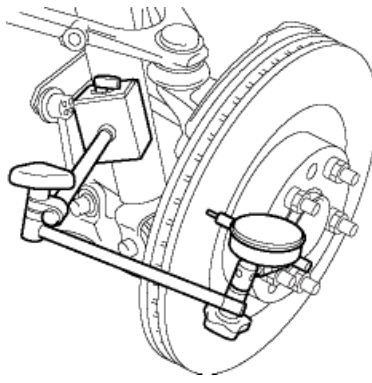
#### Lateral runout inspection

1. To secure the disc plate and the hub, insert the washer (thickness **10 mm {0.39 in}**, inner diameter **more than 12 mm {0.47 in}**) between each hub bolt and the hub nut, then tighten all the hub nuts.

#### NOTE:

- The component parts of the **SST** (49 B017 001 or 49 G019 003) can be used as a suitable washer.

2. After tightening all the hub nuts to the same torque, put the dial gauge on the friction surface of disc plate **10 mm {0.12—0.28 in}** from the disc plate edge.



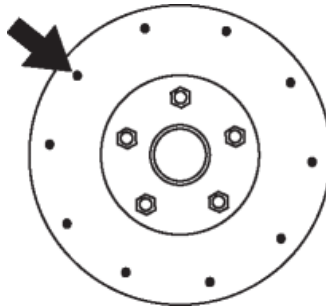
3. Rotate the disc plate one time and measure the runout.

#### Front disc plate runout limit

- 0.05 mm {0.002 in}

#### Thickness variation inspection

1. Clean the disc plate-to-pad friction surface using a brake cleaner.
2. Measure the points indicated in the illustration using a caliper (micrometer).



3. Subtract the minimum value from the maximum, and if the result is not within specification, machine the disc plate using a lathe.

#### Thickness variation limit

- 0.015 mm {0.00059 in}

#### WARNING:

- Do not exceed minimum disc plate thickness.

#### Disc Plate Thickness Inspection

#### CAUTION:

- Excessive runout may result if the disc plate is removed from the vehicle then machined. Machine the disc plate while installed on the vehicle.

1. Measure the thickness of the disc plate.

- If the thickness is not within the specification, replace the disc plate.

#### Minimum front disc plate thickness

- 20 mm {0.79 in}

#### Minimum front disc plate thickness after machining using a brake lathe on-vehicle

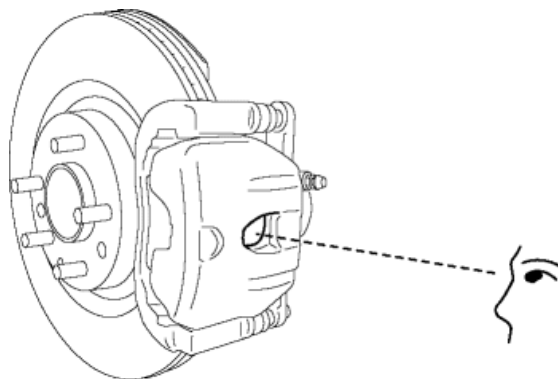
- 20.8 mm {0.82 in}

#### Disc Pad Thickness Inspection

1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the wheel and tires.
3. Verify the remaining thickness of the pads.

**Minimum front disc pad thickness**

- 2.0 mm {0.079 in} min.
4. Replace the pads as a set (right and left wheels) if either one is at or less than the minimum thickness.



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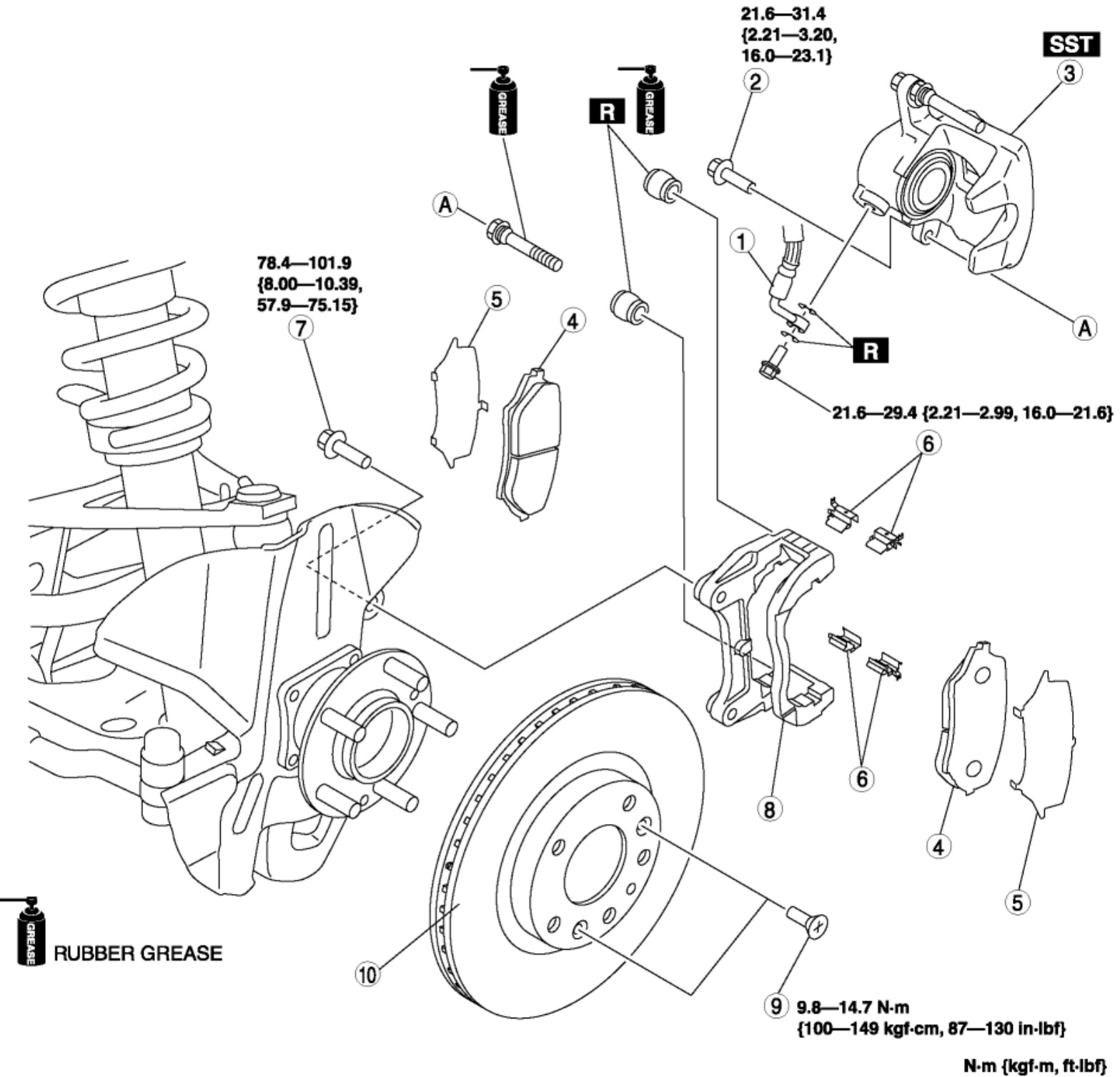
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2008 - MX-5 - Brakes

FRONT BRAKE (DISC) REMOVAL/INSTALLATION

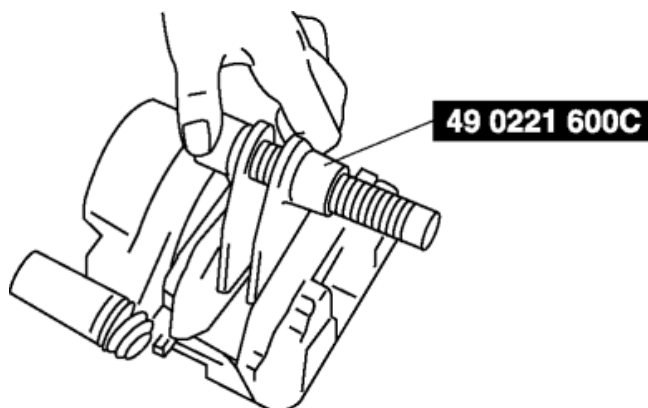
- 1. Remove in the order indicated in the table.
- 2. Install in the reverse order of removal.
- 3. After installation, depress the brake pedal a few times, then verify that the brakes do not drag.



1	Brake hose
2	Bolt
3	Caliper (See <a href="#">Caliper Installation Note.</a> )
4	Disc pad
5	Shim
6	Guide plate
7	Bolt
8	Mounting support
9	Screw
10	Disc plate

### Caliper Installation Note

1. Clean the exposed area of the piston.
2. Install the piston using the **SST**.



3. Install the caliper.

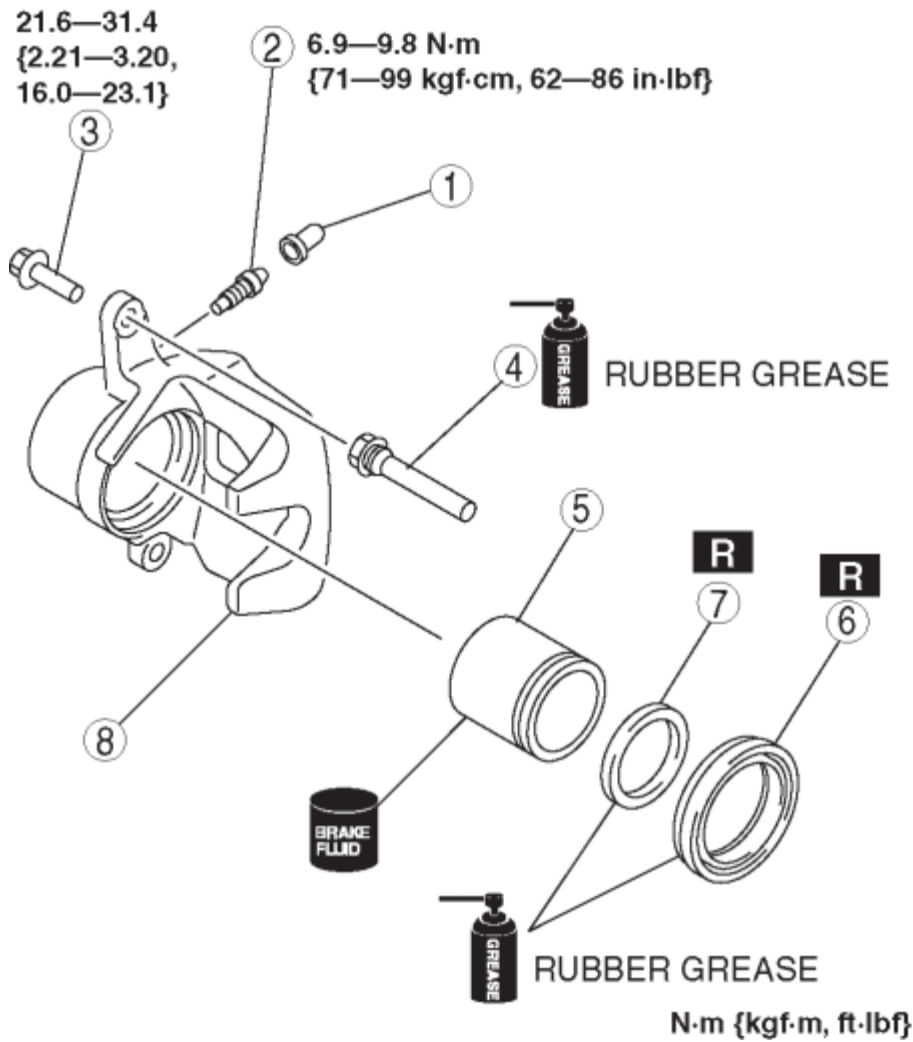
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2008 - MX-5 - Brakes

CALIPER (FRONT) DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.



1	Bleeder cap
2	Bleeder screw
3	Bolt
4	Sleeve
5	Piston



	(See <a href="#">Piston Disassembly Note.</a> )
6	Dust seal
7	Piston seal
8	Caliper body

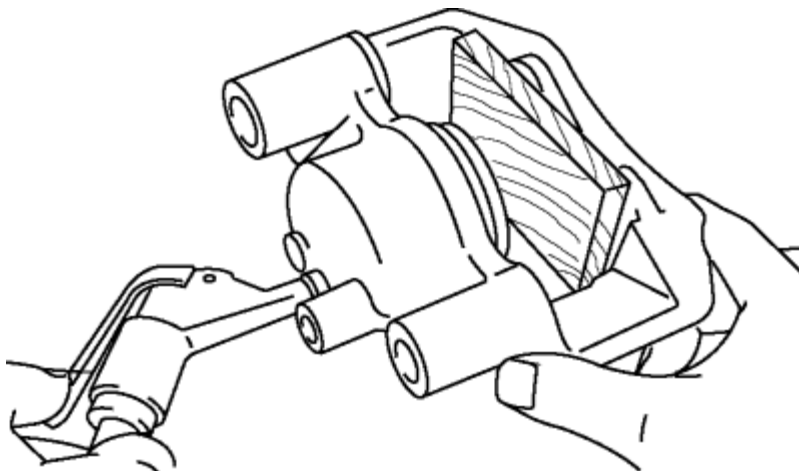
2. Assemble in the reverse order of disassembly.

## Piston Disassembly Note

### CAUTION:

- The piston could be damaged if blown out with great force. Blow the compressed air slowly to prevent the piston from suddenly popping out.

1. Insert a piece of wood in the caliper as shown in the figure, and then blow compressed air through the bleeder screw hole to remove the piston from the caliper body.



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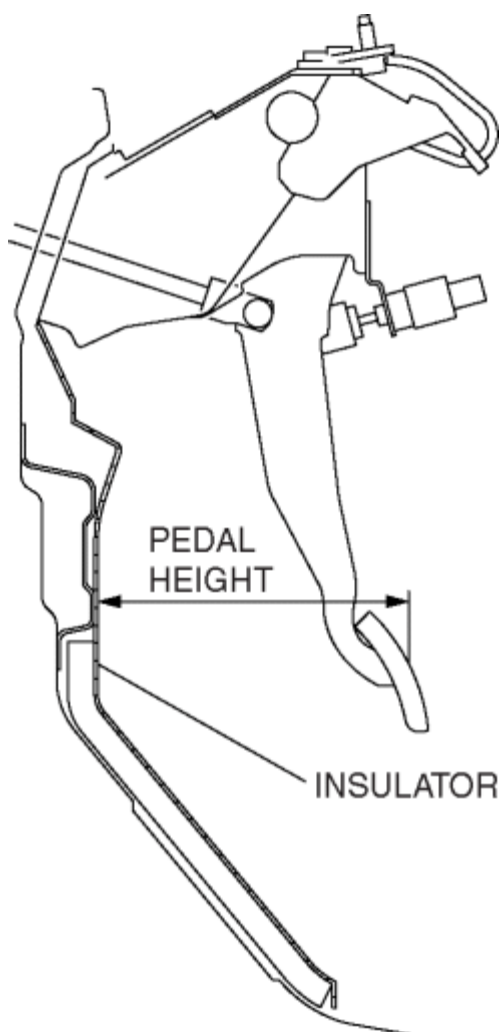
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## 2008 - MX-5 - Brakes

### BRAKE PEDAL INSPECTION

#### Brake Pedal Height Inspection

1. Measure the distance from the center of the upper surface of the pedal pad to the insulator and verify that it is as specified.



- If not within the specification, adjust the pedal height.

#### Brake pedal height (reference value)

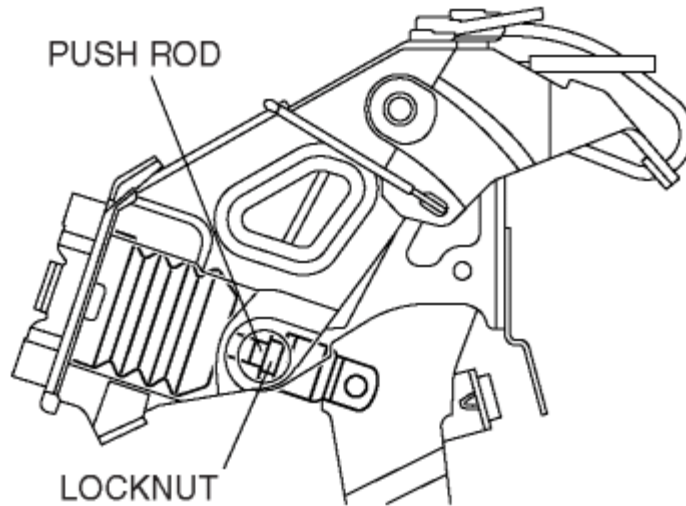
- 167 mm {6.57 in}

#### Brake Pedal Height Adjustment

## CAUTION:

- The brake switch may not operate normally after adjusting the pedal height. Whenever adjusting the pedal height, replace the brake switch with a new one.
- The interlock cable may not operate normally after adjusting the pedal height. Whenever adjusting the pedal height, refer to the interlock cable installation note. (See **SELECTOR LEVER REMOVAL/INSTALLATION**.)

1. Loosen the locknut and turn the push rod to adjust the pedal height.



2. Tighten the locknut.

### Tightening torque

- 20.4—30.6 N·m {2.09—3.12 Kgf·m, 15.0—22.5 ft·lbf}

3. After adjustment, inspect the pedal play.

## Brake Pedal Play Inspection

1. Depress the pedal several times to release the vacuum in the power brake unit.
2. Gently depress the pedal by hand, and measure the pedal play.
  - If not within the specification, inspect the wear of the clevis pin and replace it if there is any malfunction.

### Brake pedal play

- 2—5 mm {0.08—0.19 in}

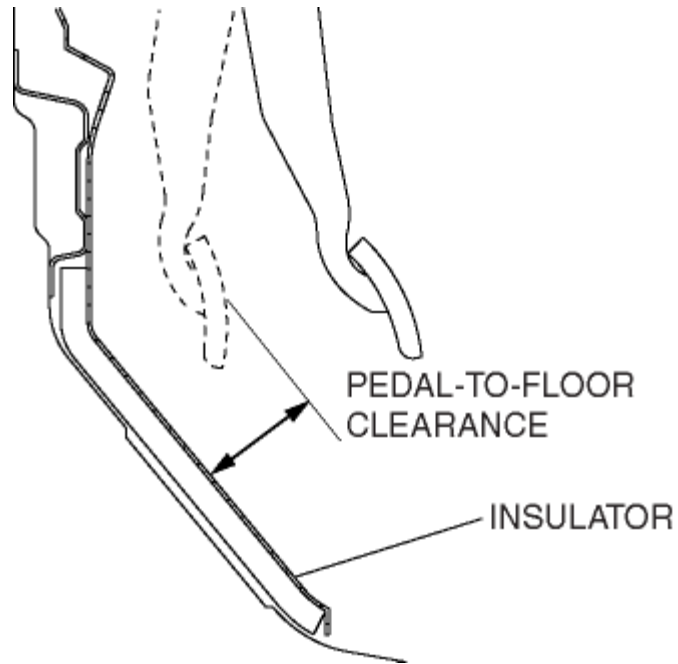
## NOTE:

- If there is no malfunction in the clevis pin, there is a possibility that the power brake unit has some malfunction. Verify that there are no malfunctions, and replace it if necessary.

## Pedal-to-floor Clearance Inspection

1. Start the engine and depress the pedal with a pedal force of **147 N {15.0 Kgf, 33.0 lbf}**.

2. Measure the distance between the pedal pad center and the insulator, and verify that it is as specified.



- If the pedal-to-floor clearance is less than the specification, check for air in the brake system.

**Brake pedal-to-floor clearance (Brake pedal when depressed at 147 N { 15.0 Kgf, 33.0 lbf})**

- 106.9 mm {4.209 in} or more

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## 2008 - MX-5 - Brakes

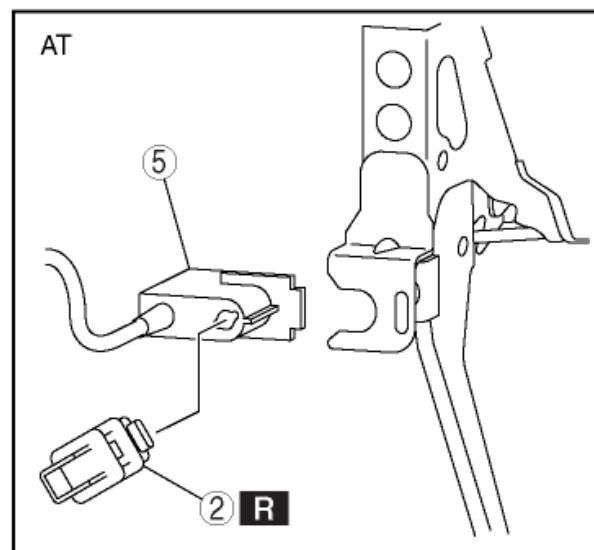
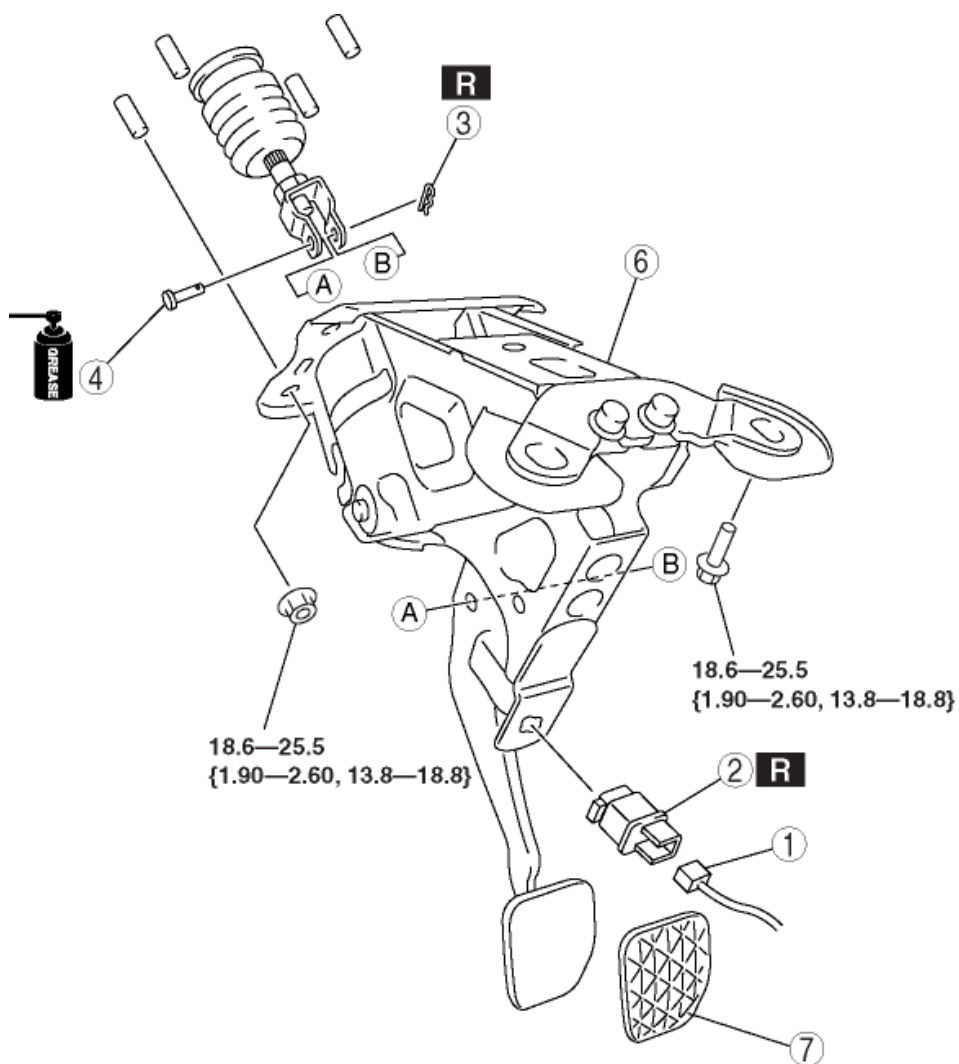
### BRAKE PEDAL REMOVAL/INSTALLATION

#### CAUTION:

- The clearance between the brake switch and the brake pedal is automatically adjusted to the correct amount when the brake switch connector is connected after the brake switch has been properly installed. If the brake switch is not properly installed or the connector is connected before installation, the clearance may be incorrect, causing a brake light malfunction. Therefore, always verify that the brake switch is properly installed before connecting the connector.
- Once the brake switch clearance has automatically been adjusted, it cannot be adjusted again. Therefore, replace the switch with a new one when replacing the power brake unit or the pedal, or performing any procedure that changes the pedal stroke.
- When replacing the brake pedal (AT), it is possible that the installation of the interlock cable could become defective. Always refer to the interlock cable installation note when replacing the brake pedal. (See [SELECTOR LEVER REMOVAL/INSTALLATION](#).)

#### NOTE:

- When the brake switch connector is connected to the brake switch, the clearance between the pedal and the brake switch is adjusted automatically. However, this mechanism will only function one time.
1. Remove in the order indicated in the table.
  2. Install in the reverse order of removal.



N·m {kgf·m, ft·lb}

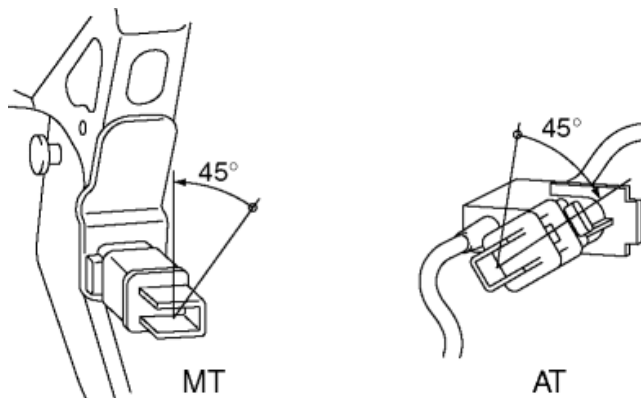
1	Brake switch connector (See <a href="#">Brake Switch Connector Installation Note.</a> )
2	Brake switch (See <a href="#">Brake Switch Installation Note.</a> )
3	Snap pin
4	Clevis pin
5	Interlock cable (AT) (See <a href="#">SELECTOR LEVER REMOVAL/INSTALLATION.</a> )
6	Brake pedal (See <a href="#">Brake Pedal Removal Note.</a> )
7	Pedal pad

### Brake Pedal Removal Note

1. Move the power brake unit to the vehicle front where the power brake unit fork does not interfere with the brake pedal arm.
2. Remove the brake pedal.

### Brake Switch Installation Note

1. Install the new brake switch to the brake pedal (MT) or the interlock cable (AT), and secure it by turning it clockwise **45°** (AT) or counterclockwise **45°** (MT).



### Brake Switch Connector Installation Note

1. Inspect the brake pedal. (See [BRAKE PEDAL INSPECTION](#).)
2. With the brake pedal in its original position, install the brake switch to the brake switch connector.

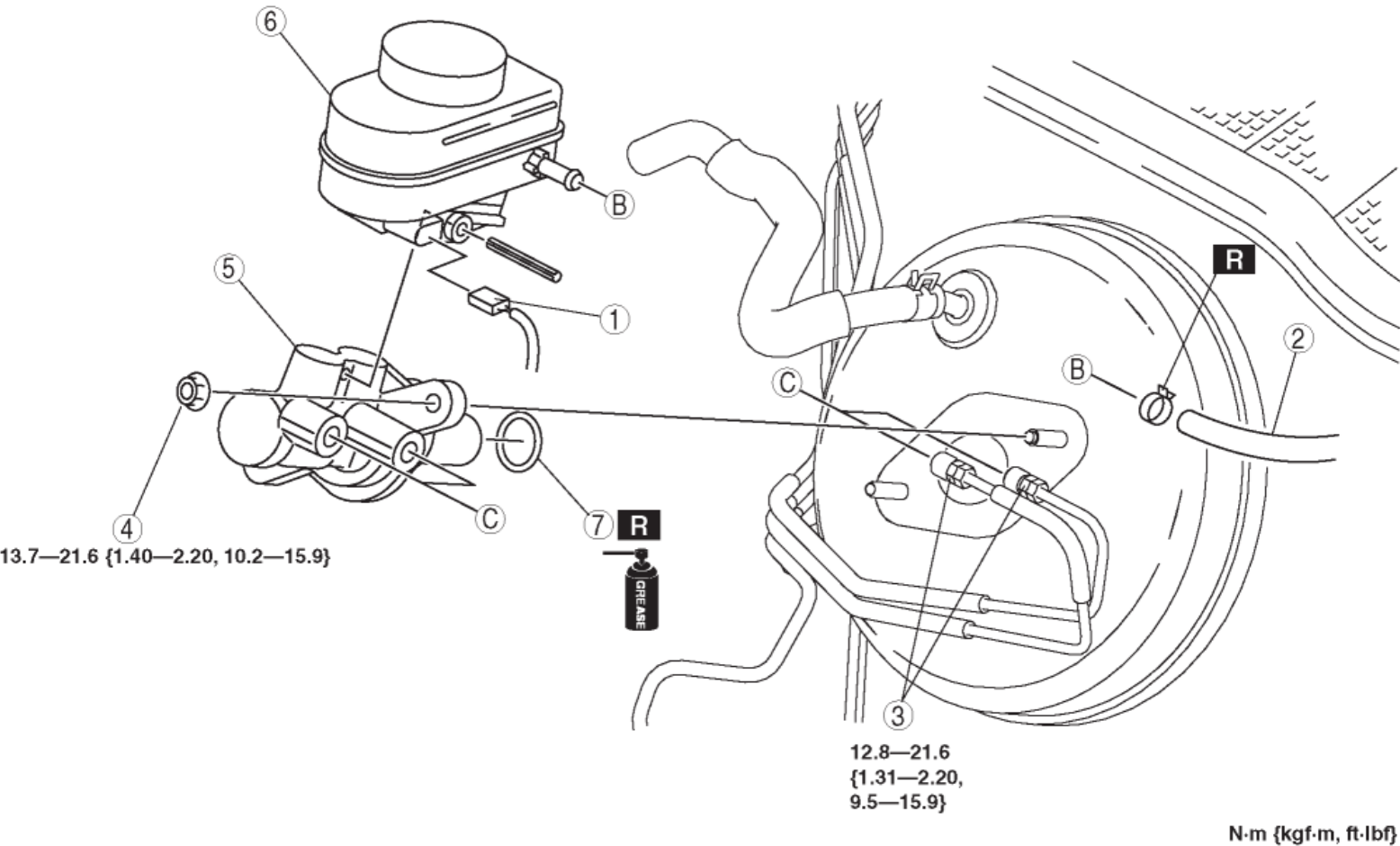
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2008 - MX-5 - Brakes

MASTER CYLINDER REMOVAL/INSTALLATION

- 1. Remove in the order indicated in the table.
- 2. Install in the reverse order of removal.



1	Brake fluid level sensor connector
2	Hose (MT)
3	Brake pipe
4	Nut
5	Master cylinder (See <a href="#">Master Cylinder Installation Note.</a> )
6	Reserve tank
7	O-ring

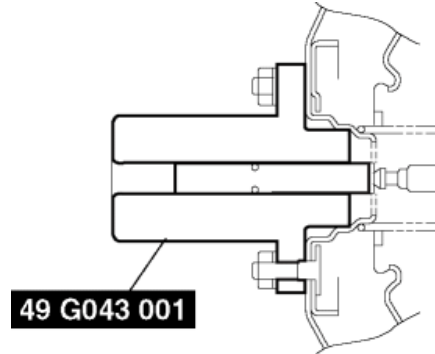


## Master Cylinder Installation Note

### CAUTION:

- If the master cylinder is installed at an angle, the master cylinder piston may push against the push rod retainer of the power brake unit causing poor air bleeding, brake drag, or other malfunctions. Be sure to install the master cylinder at a perpendicular angle to the power brake unit.

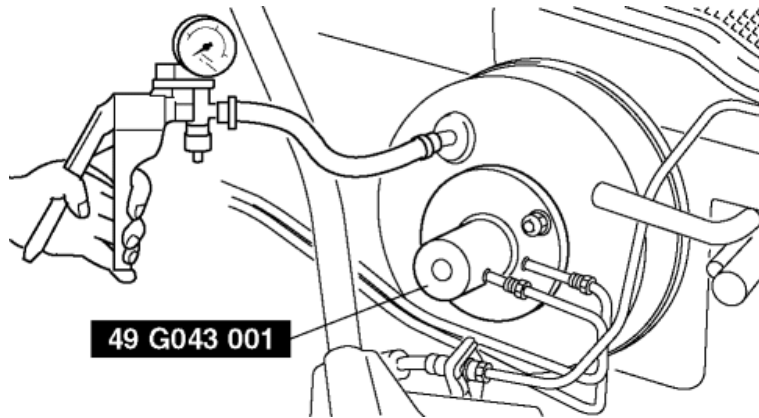
1. Install the **SST** to the power brake unit and tighten to the specified torque.



### Tightening torque

- 13.7—21.6 N·m {1.4—2.2 kgf·m, 10.2—15.9 ft·lbf}

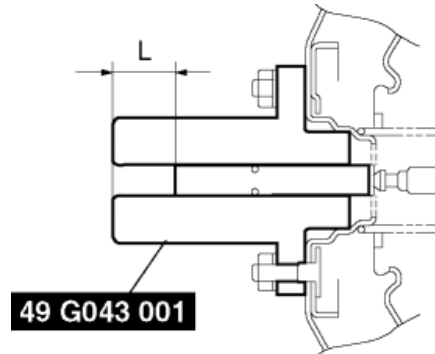
2. Apply a vacuum of **66.7 kPa {500 mmHg, 19.7 inHg}** to the power brake unit using a vacuum gauge.



### NOTE:

- Use any commercially available vacuum gauge.

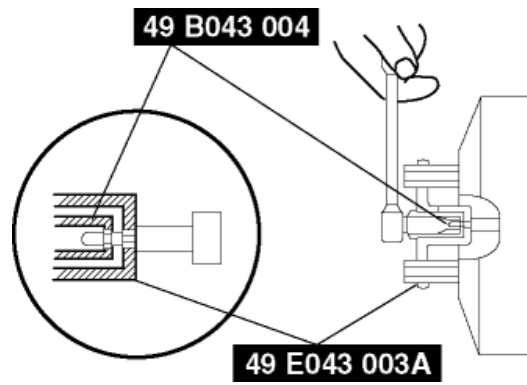
3. Using calipers, measure dimension L as shown in the figure.



### Standard L dimension

- 30.4—30.6 mm {1.197—1.204 in}

4. If dimension L is not within the standard, remove the **SST** (49 G043 001) and, while stopping the push rod rotation with the **SST** (49 E043 003A), adjust the push rod length with the **SST** (49 B043 004).



5. Switch the **SSTs** and remeasure dimension L.
6. Install the master cylinder to the power brake unit.

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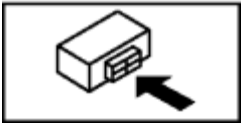
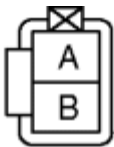
2008 - MX-5 - Brakes

BRAKE FLUID LEVEL SENSOR INSPECTION

- 1. Disconnect the brake fluid level sensor connector from the master cylinder.
- 2. Inspect for continuity according to fluid level between the brake fluid level sensor terminals.
  - If not as indicated in the table, replace the reserve tank.

○—○: Continuity

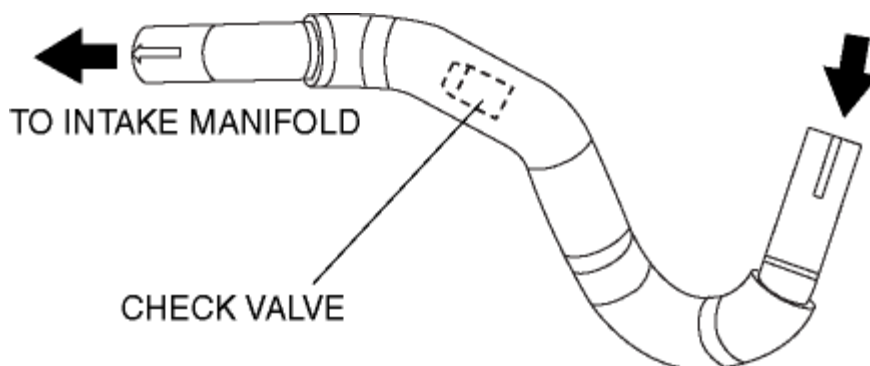
Condition	Terminal	
	A	B
Above MIN		
Below MIN	○—○	○—○



## 2008 - MX-5 - Brakes

### VACUUM LINE INSPECTION

1. Remove the vacuum hose between the power brake unit and the intake manifold using pliers.
2. Verify that air can be blown from the power brake unit side of the vacuum hose towards the intake manifold side, and that air cannot be blown in the opposite direction.
  - If there is any malfunction of the inner check valve, replace it together with the vacuum hose as a single unit.



## 2008 - MX-5 - Brakes

### POWER BRAKE UNIT INSPECTION

#### NOTE:

- The following inspection methods are simple inspection methods to judge the function of the power brake unit.
- If there is any malfunction in the power brake unit, replace the power brake unit as a single unit.

#### Without Using SST

##### Operation inspection

1. With the engine stopped, depress the pedal several times.
2. With the pedal depressed, start the engine.
3. If the pedal moves down slightly immediately after starting the engine, the unit is normal.

##### Vacuum function inspection

1. Start the engine.
2. After driving the vehicle for **1—2 min**, stop the engine.
3. Depress the pedal with normal force.
4. If the first pedal stroke is long and becomes shorter with subsequent strokes, the unit is normal.
  - If a problem is found, inspect for damage to or improper installation of the check valve and vacuum hose. After repairing, inspect again.

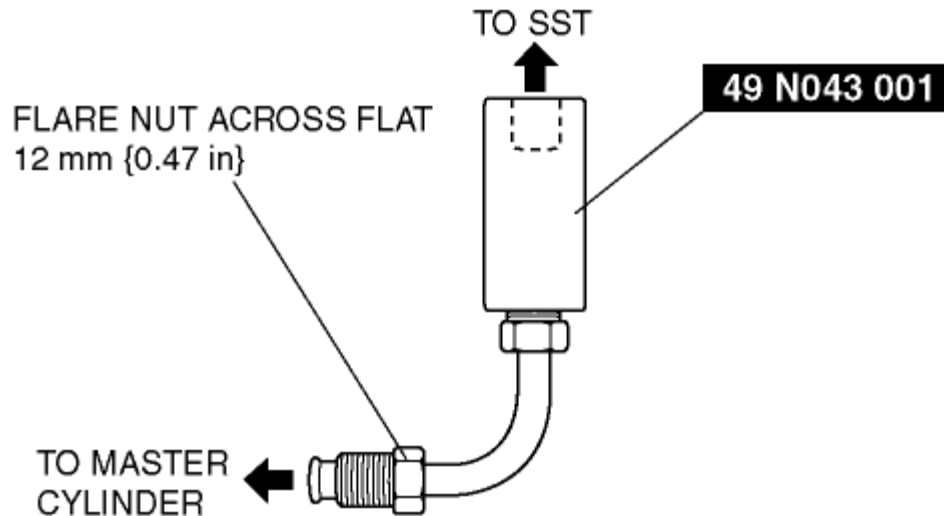
##### Vacuum loss function inspection

1. Start the engine.
2. Depress the pedal with normal force.
3. With the pedal depressed, stop the engine.
4. Maintain the pedal depressed for **approx. 30 s**.
5. If the pedal height does not change during this time, the unit is normal.

## Using SST

### Pre-inspection preparation

1. Install the **SST** (49 N043 001) in the orientation shown in the figure. (with DSC)

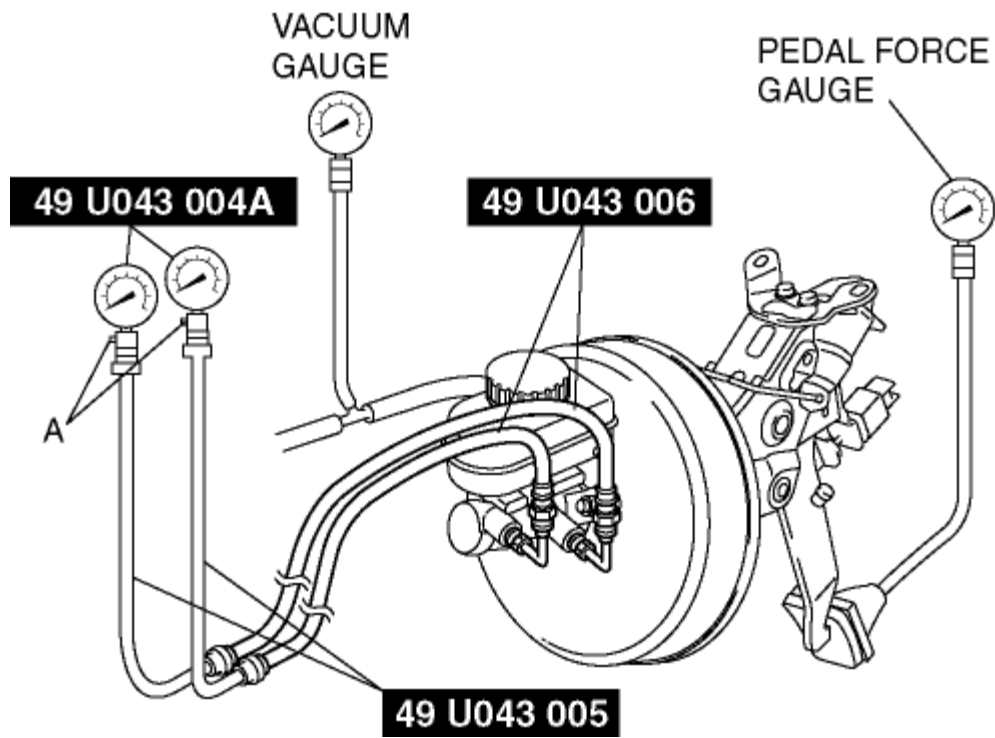


#### NOTE:

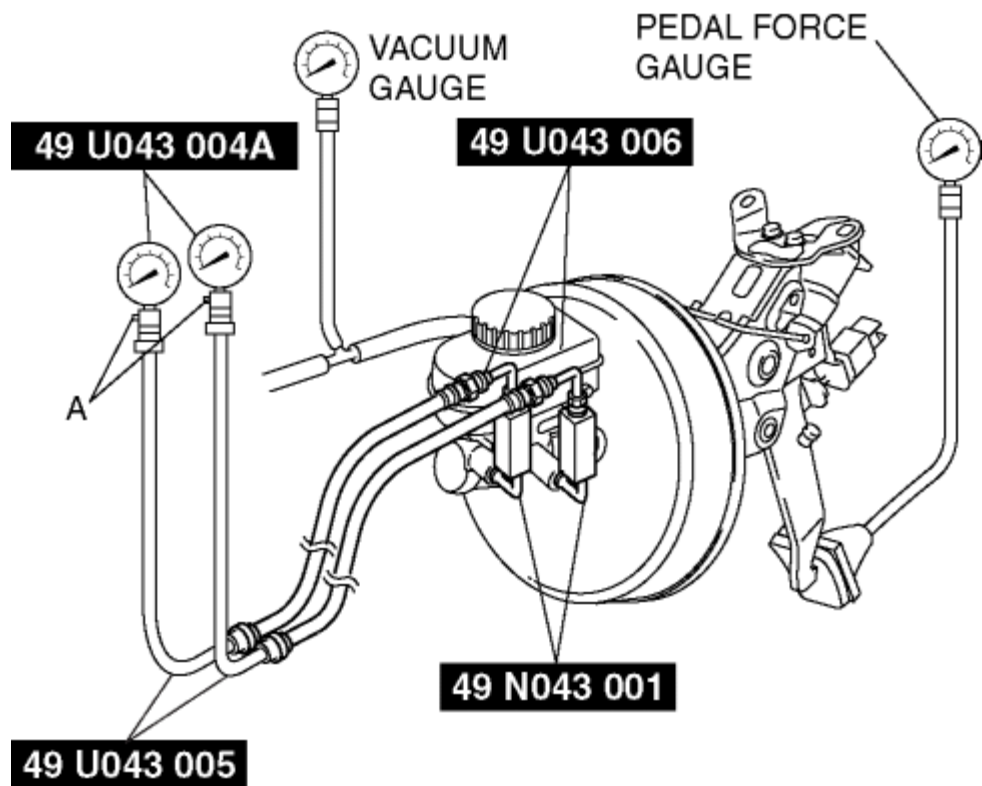
- Install the **SST** (49 N043 001) to the master cylinder using a commercially available flare nut wrench.
  - Flare nut across flat: **12 mm {0.47 in}**

2. Connect the **SSTs**, a vacuum gauge and a pedal force gauge to the master cylinder and bleed the air from the **SSTs** and the brake line. (Bleed the air from the **SSTs** through air bleeding valve A.)

Without DSC



With DSC



#### Checking for vacuum loss (loaded condition)

1. Start the engine.
2. Depress the brake pedal with a force of **200 N {20.4 kgf, 44.9 lbf}**.
3. With the brake pedal depressed, turn off the engine when the vacuum gauge reaches **68 kPa {510 mmHg, 20.1 inHg}**.

4. Within **15 s** right after stopping the engine, measure the lowest amount of vacuum.
5. If the lowest amount is **3.3 kPa {25 mmHg, 1.0 inHg}** or less, the system is normal.

#### Lack of hydraulic pressure inspection

1. With the engine stopped and the vacuum amount at **0 kPa {0 mmHg, 0 inHg}** if the pedal force and fluid pressure correlation is within the specification, the system is normal. **Power brake unit fluid pressure**

Vacuum amount at 0 kPa {0 mmHg, 0 inHg}	
Pedal force (N {kgf, lbf})	Fluid pressure (kPa {kgf/cm <sup>2</sup> , psi})
200 {20.4, 44.9}	620 {6.33, 90.0} or more

#### Hydraulic pressure inspection

1. Start the engine and when the vacuum amount reaches **66.7 kPa {500 mmHg, 19.7 inHg}**, depress the brake pedal.
2. At this time, apply the indicated pedal force and if the fluid pressure is within the specification, the unit is normal. **Power brake unit fluid pressure**

Vacuum amount at 66.7 kPa {500 mmHg, 19.7 inHg}	
Pedal force (N {kgf, lbf})	Fluid pressure (kPa {kgf/cm <sup>2</sup> , psi})
200 {20.4, 44.9}	6,340 {64.65, 919.6} or more

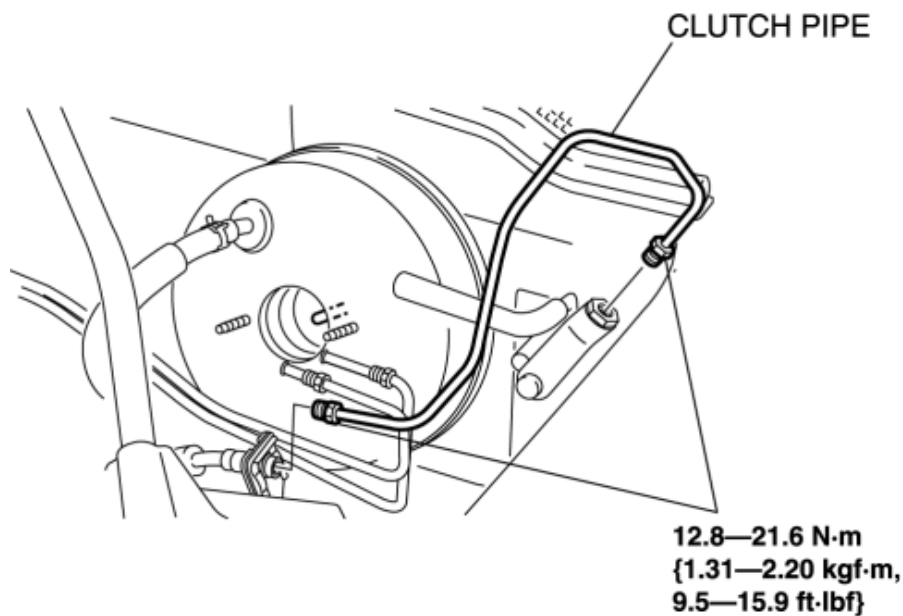


## 2008 - MX-5 - Brakes

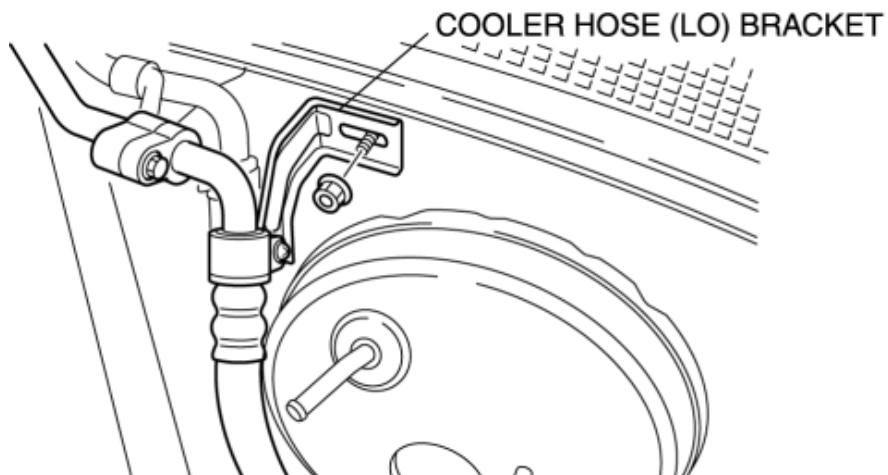
### POWER BRAKE UNIT REMOVAL/INSTALLATION

#### CAUTION:

- Once the brake switch clearance has automatically been adjusted, it cannot be adjusted again. Therefore, replace the switch with a new one when replacing the power brake unit or performing any procedure that changes the pedal stroke.
1. Remove the master cylinder. (See [MASTER CYLINDER REMOVAL/INSTALLATION](#).)
  2. Remove the clutch pipe. (MT)

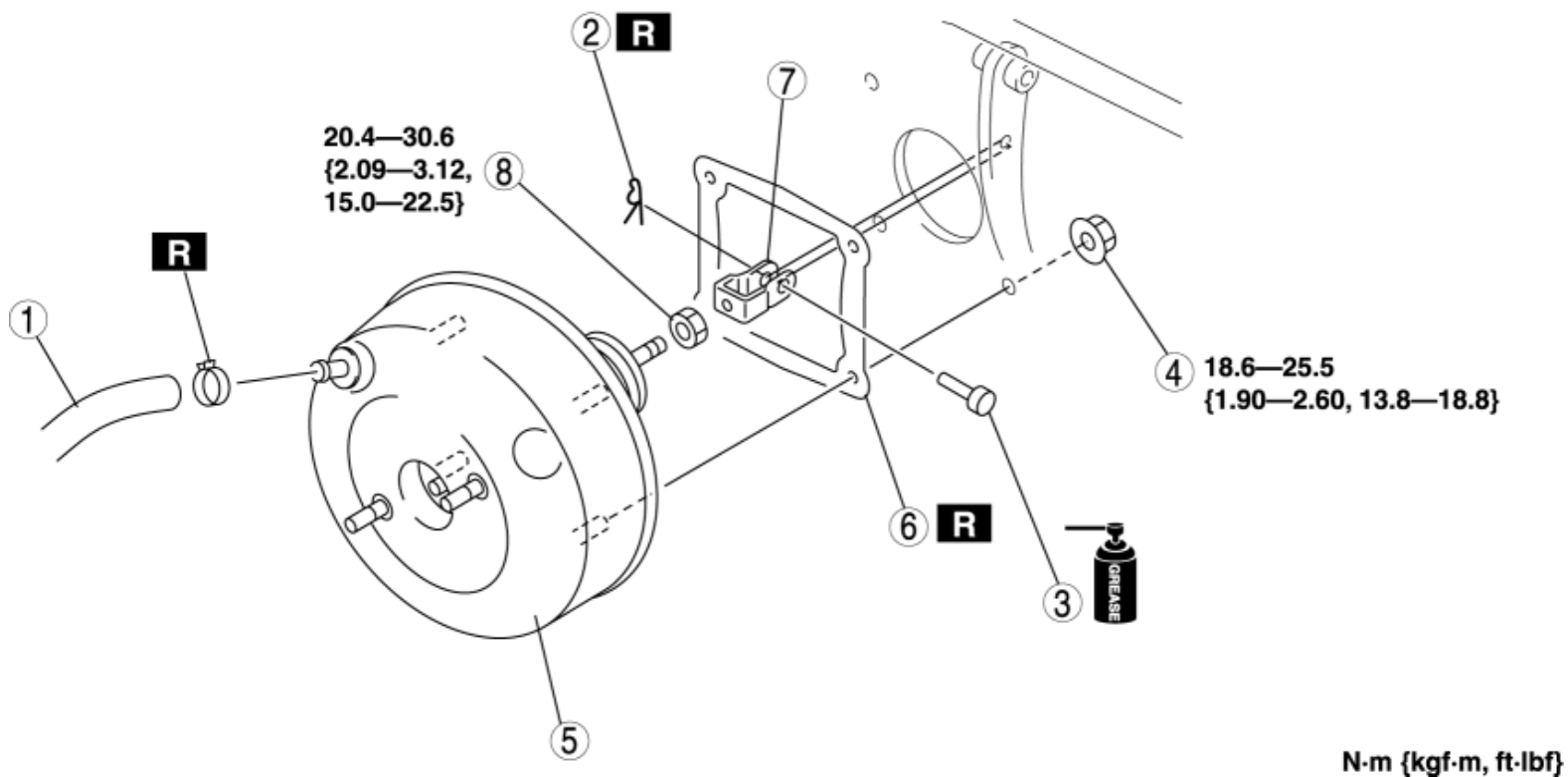


3. Remove the nut shown in the figure, then remove the cooler hose (LO) bracket from the vehicle.



4. Remove in the order indicated in the table.
5. Remove the brake switch. (See [BRAKE PEDAL REMOVAL/INSTALLATION](#).)
6. Install in the reverse order of removal.

7. After installation, perform brake pedal inspection. (See [BRAKE PEDAL INSPECTION.](#))



1	Vacuum hose
2	Snap pin
3	Clevis pin
4	Nut
5	Power brake unit
6	Gasket
7	Fork
8	Locknut

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2008 - MX-5 - Brakes

BRAKE SWITCH INSPECTION

CAUTION:

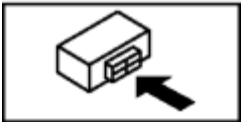
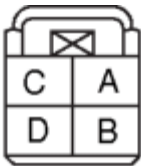
- If the brake switch is removed from the brake pedal or the interlock unit, its proper functioning cannot be guaranteed when reinstalled. Therefore, inspect the brake switch with it still installed, or replace the brake switch if it is removed.

1. Verify continuity as indicated in the table.

- If not as indicated in the table, replace the brake switch.

○—○ : Continuity

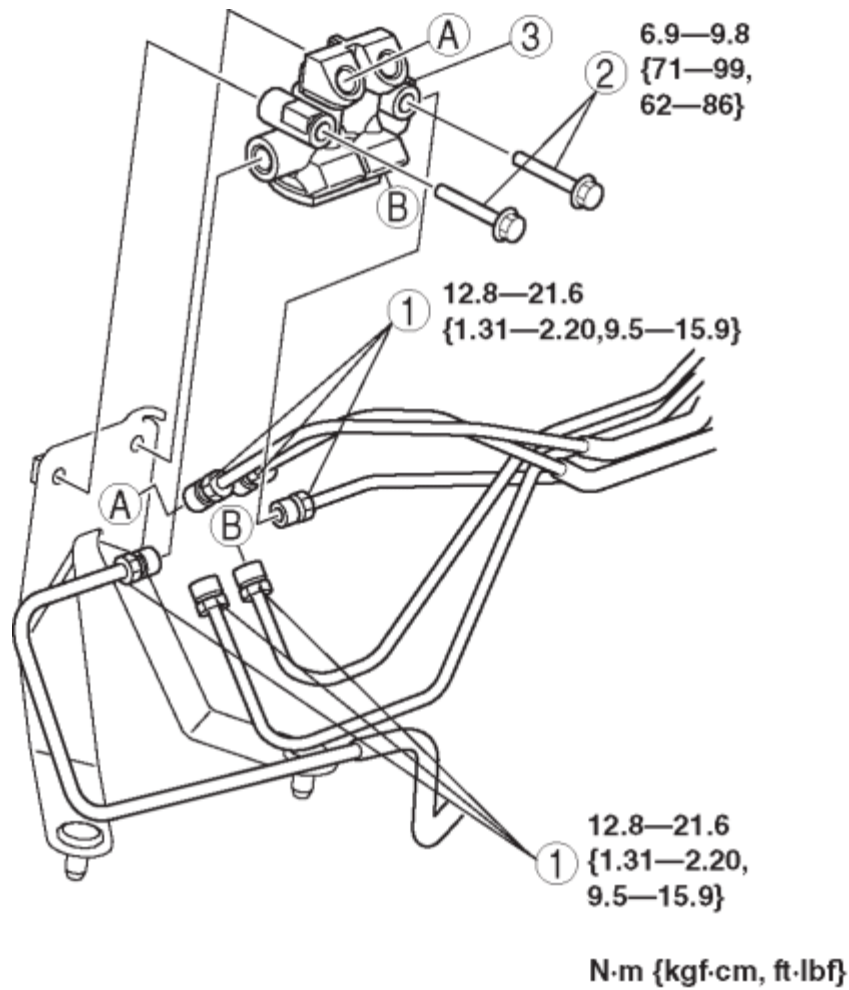
Condition	Terminal			
	A	B	C	D
When the brake pedal is depressed		○—○		
When the brake pedal is not depressed (With cruise control system)	○—○		○—○	



2008 - MX-5 - Brakes

DUAL PROPORTIONING VALVE REMOVAL/INSTALLATION

1. Remove in the order indicated in the table.

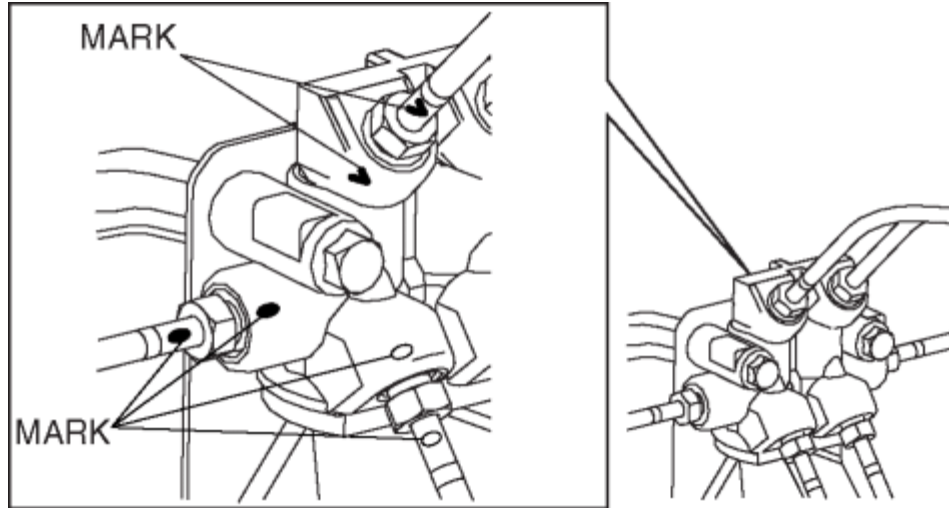


1	Brake pipe (See <a href="#">Brake Pipe Removal Note.</a> ) (See <a href="#">Brake Pipe Installation Note.</a> )
2	Bolt
3	Dual proportioning valve (See <a href="#">Dual Proportioning Valve Installation Note</a> )

2. Install in the reverse order of removal.

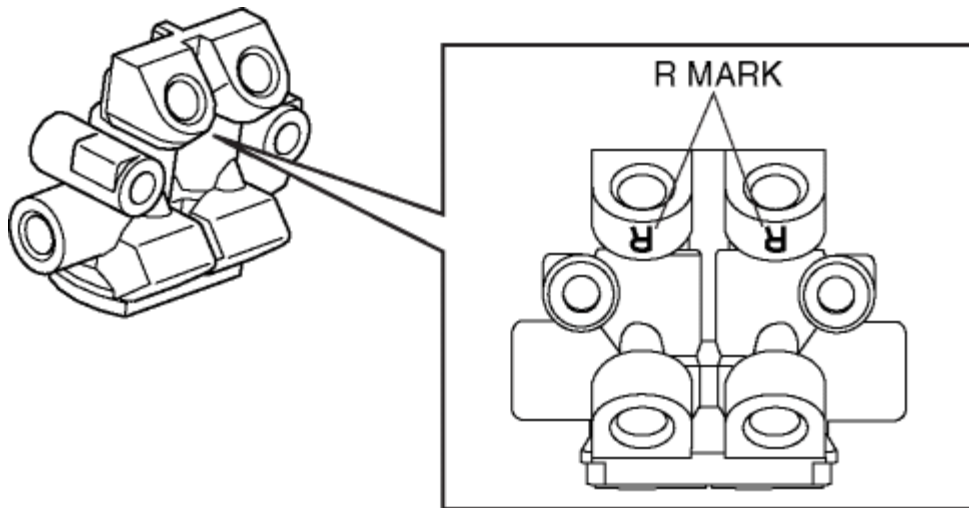
### Brake Pipe Removal Note

1. Place an alignment mark on the brake pipe and dual proportioning valve.



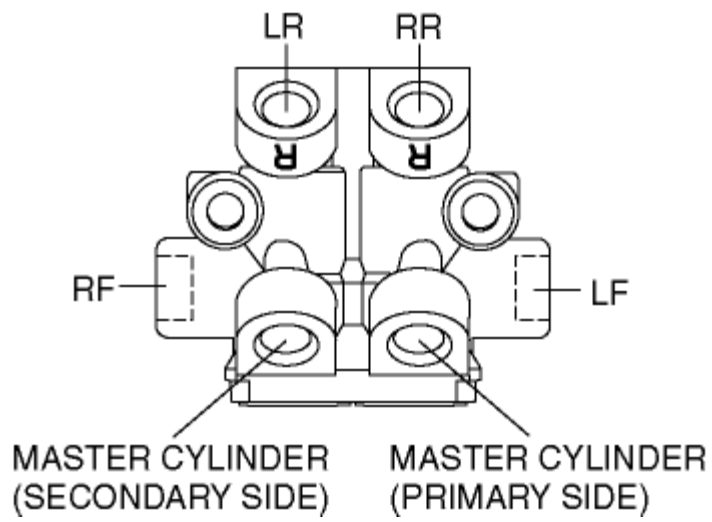
### Dual Proportioning Valve Installation Note

1. Install the dual proportioning valve so that the R marks faces the upper side of the vehicle.



### Brake Pipe Installation Note

1. Align the marks made before removal and install the brake pipe to the dual proportioning valve referring to the figure.



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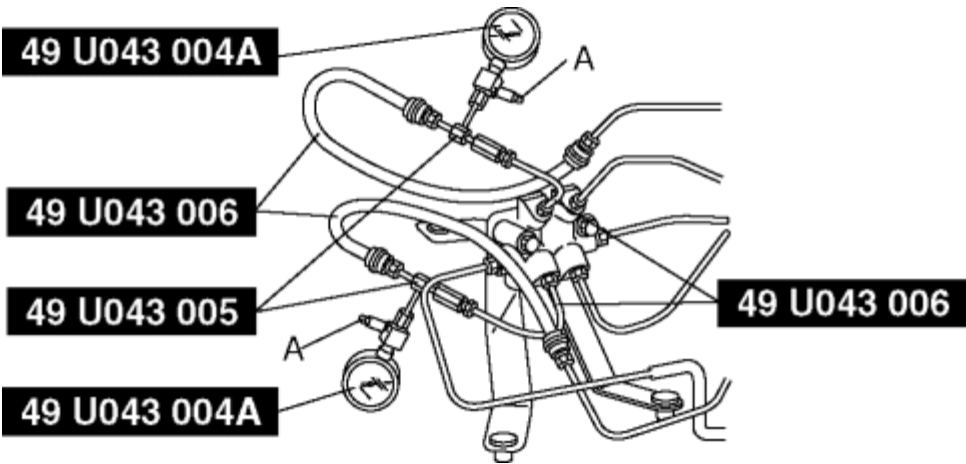
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2008 - MX-5 - Brakes

DUAL PROPORTIONING VALVE INSPECTION

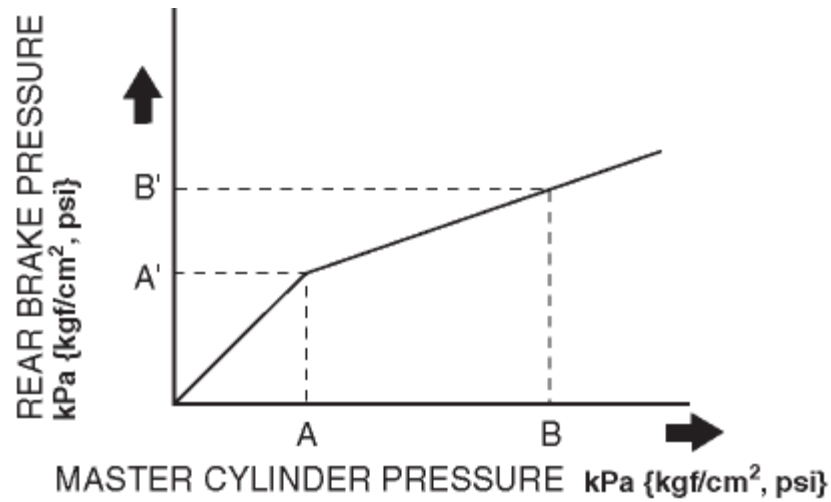
1. Connect the **SSTs** to the brake pipes as shown in the figure.



2. Bleed the air from the brake system and the **SSTs**. (Bleed the air from the **SSTs** through air bleeding valve A.)

3. Measure the fluid pressure of the master cylinder and the rear brake.

- If not within the specification, replace the dual proportioning valve.



Dual proportioning valve fluid pressure

MASTER CYLINDER PRESSURE (kPa {kgf/cm <sup>2</sup> , psi})	REAR BRAKE PRESSURE (kPa {kgf/cm <sup>2</sup> , psi})
A: 3,430 {34.98, 497.5}	A": 3,130 {31.92, 453.9} — 3,730 {38.04, 540.9}

B: 5,880 {59.96, 852.8}

B": 4,010 {40.90, 581.7} — 4,810 {49.05, 697.6}

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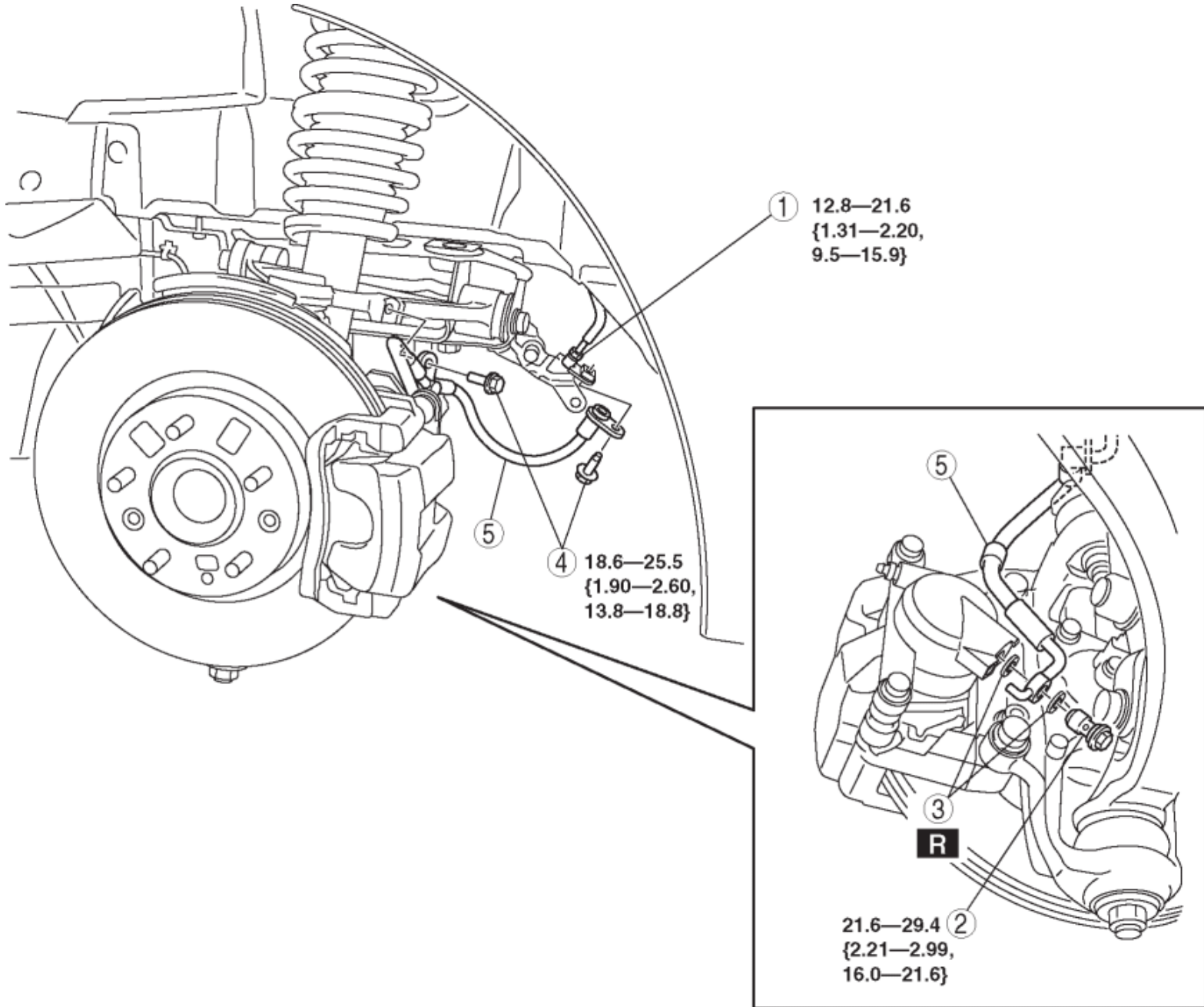
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## 2008 - MX-5 - Brakes

### BRAKE HOSE (FRONT) REMOVAL/INSTALLATION

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. After installation, add brake fluid, bleed the air, and inspect for fluid leakage. (See [AIR BLEEDING](#).)



N·m {kgf·in, ft·lbf}

1	Brake pipe
2	Connector bolt
3	Gasket
4	Bolt
5	Brake hose

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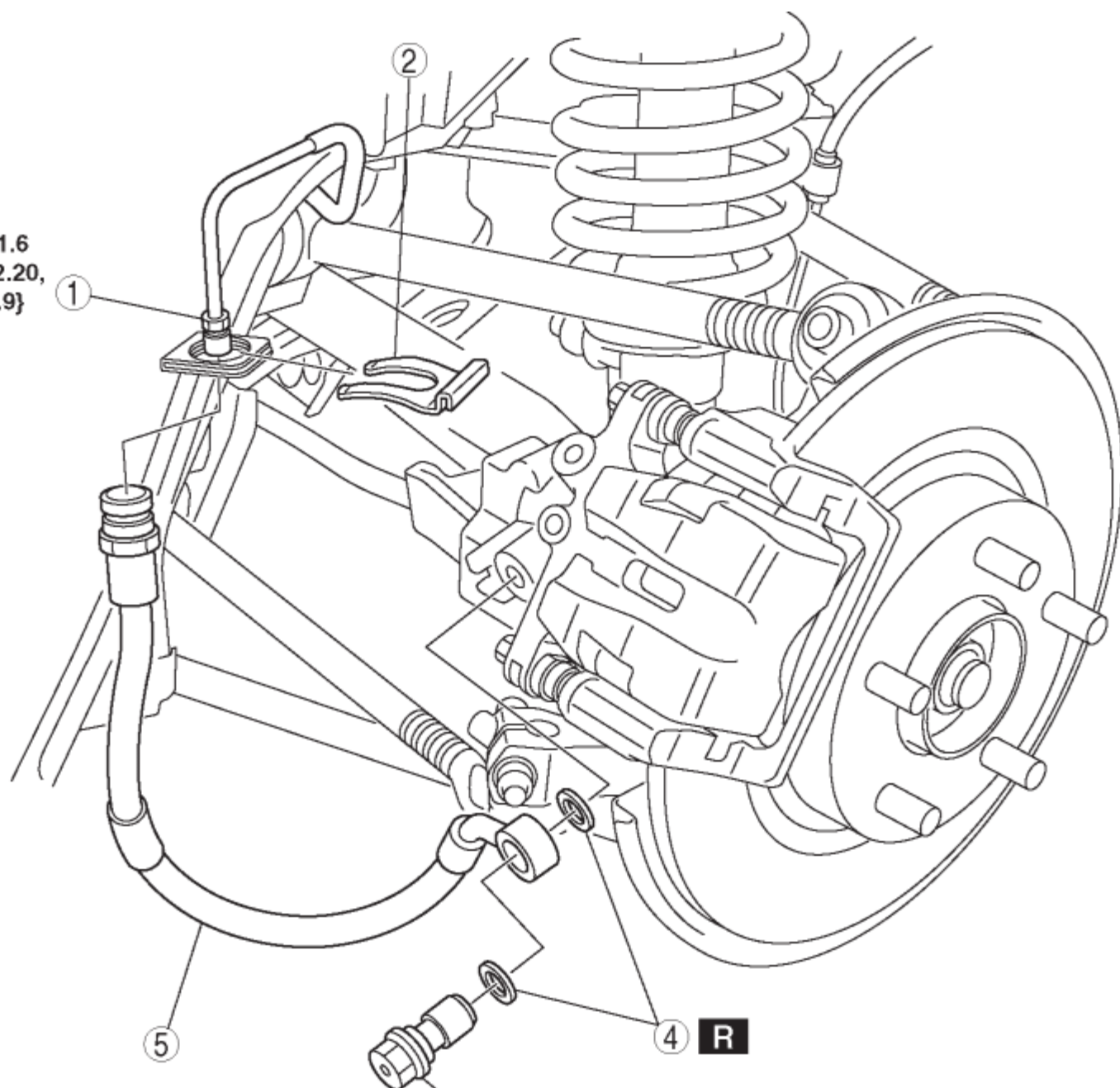
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## 2008 - MX-5 - Brakes

### BRAKE HOSE (REAR) REMOVAL/INSTALLATION

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. After installation, add brake fluid, bleed the air, and inspect for fluid leakage. (See [AIR BLEEDING](#).)

12.8—21.6  
{1.31—2.20,  
9.5—15.9}



21.6—29.4  
{2.21—2.99,  
16.0—21.6}

N·m {kgf·m, ft·lbf}

1 Brake pipe

2 Clip

3 Connector bolt

4 Gasket

5	Brake hose
---	------------

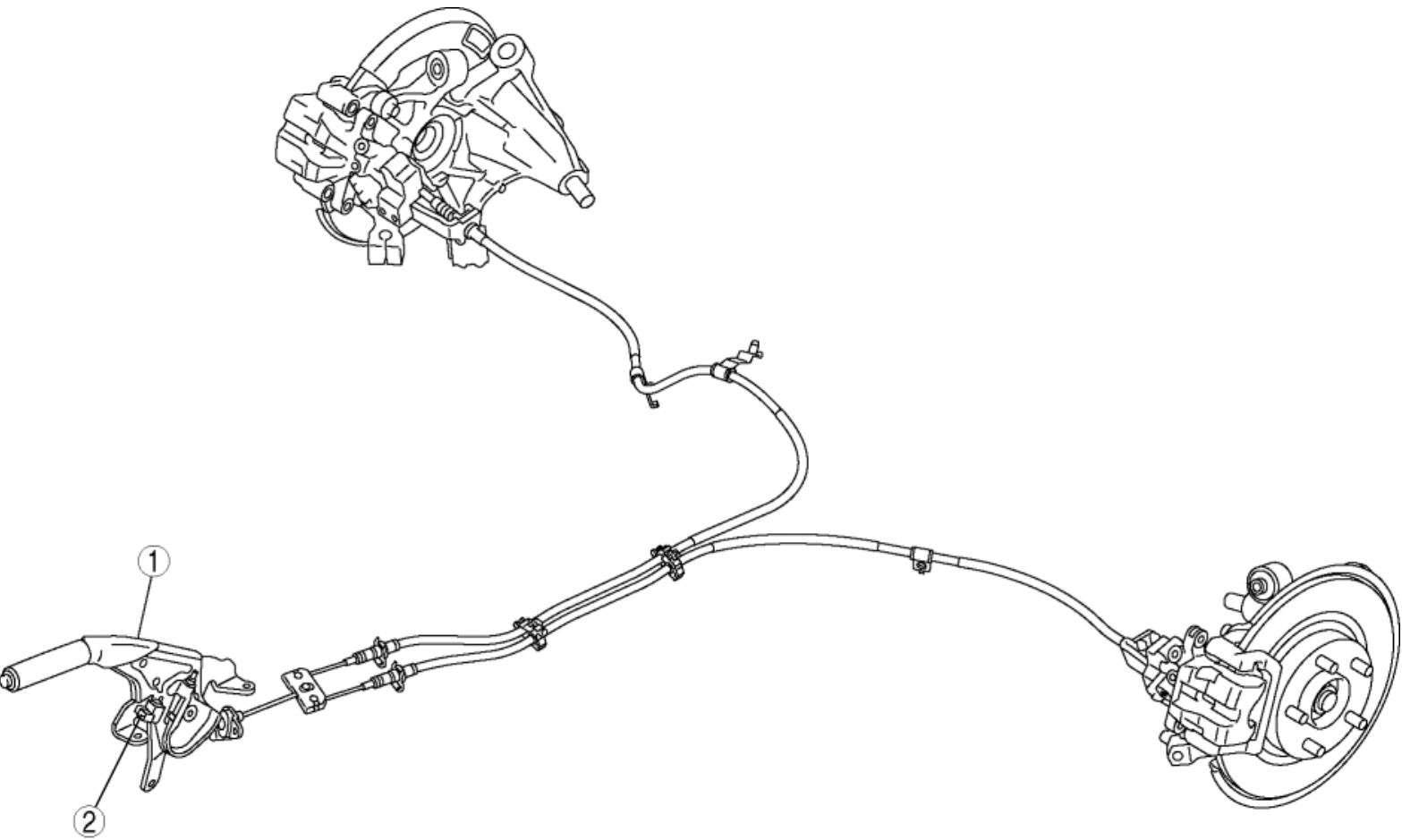
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PARKING BRAKE SYSTEM LOCATION INDEX



1	Parking brake lever (See <a href="#">PARKING BRAKE LEVER INSPECTION.</a> ) (See <a href="#">PARKING BRAKE LEVER ADJUSTMENT.</a> ) (See <a href="#">PARKING BRAKE LEVER REMOVAL/INSTALLATION.</a> )
2	Parking brake switch (See <a href="#">PARKING BRAKE SWITCH INSPECTION.</a> )

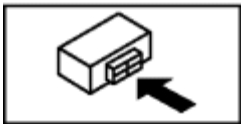
2008 - MX-5 - Brakes

PARKING BRAKE SWITCH INSPECTION

- 1. Disconnect the parking brake switch connector.
- 2. Verify that the continuity is as indicated in the table.
  - If not as indicated in the table, replace the parking brake switch.

○—○: Continuity

Condition	Terminal	
	A	Body ground
Parking brake lever pulled	○—○	○—○
Parking brake lever released		

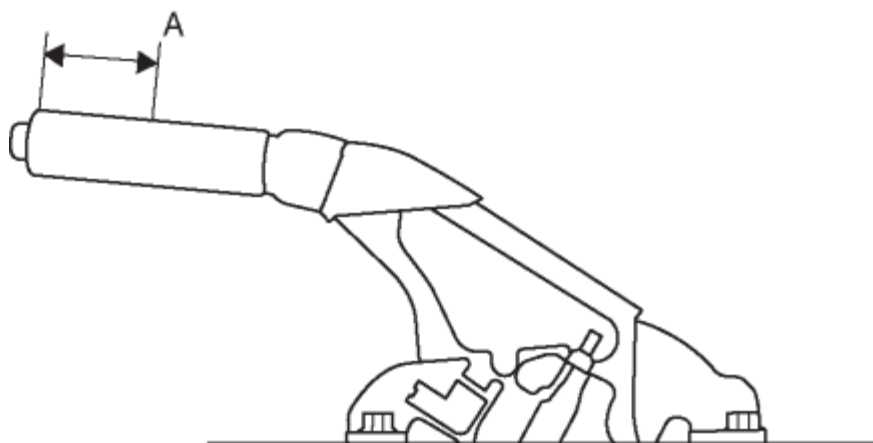


## 2008 - MX-5 - Brakes

### PARKING BRAKE LEVER INSPECTION

#### Stroke Inspection

1. Depress the brake pedal several times.
2. Pull the parking brake lever **2—3 times**.
3. Inspect the parking brake stroke by slowly pulling at point A **50 mm {1.97 in}** from the end of the parking brake lever with a force of **98 N {10 kgf, 22 lbf}** and counting the number of notches (clicking sound).



- If not within the specification, adjust the parking brake lever.

#### **Parking brake lever stroke when pulled at 98 N {10 kgf, 22 lbf}**

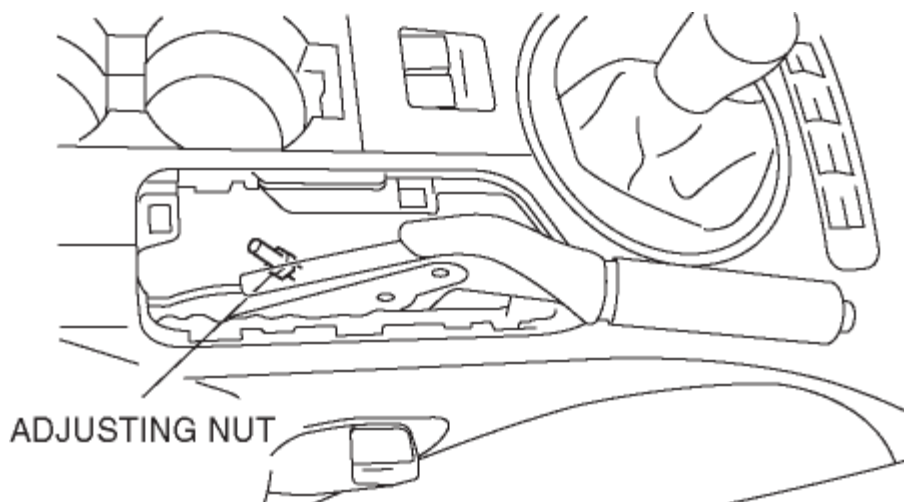
- 1—3 notches



## 2008 - MX-5 - Brakes

### PARKING BRAKE LEVER ADJUSTMENT

1. Depress the brake pedal several times.
2. Remove the parking brake lever boot.

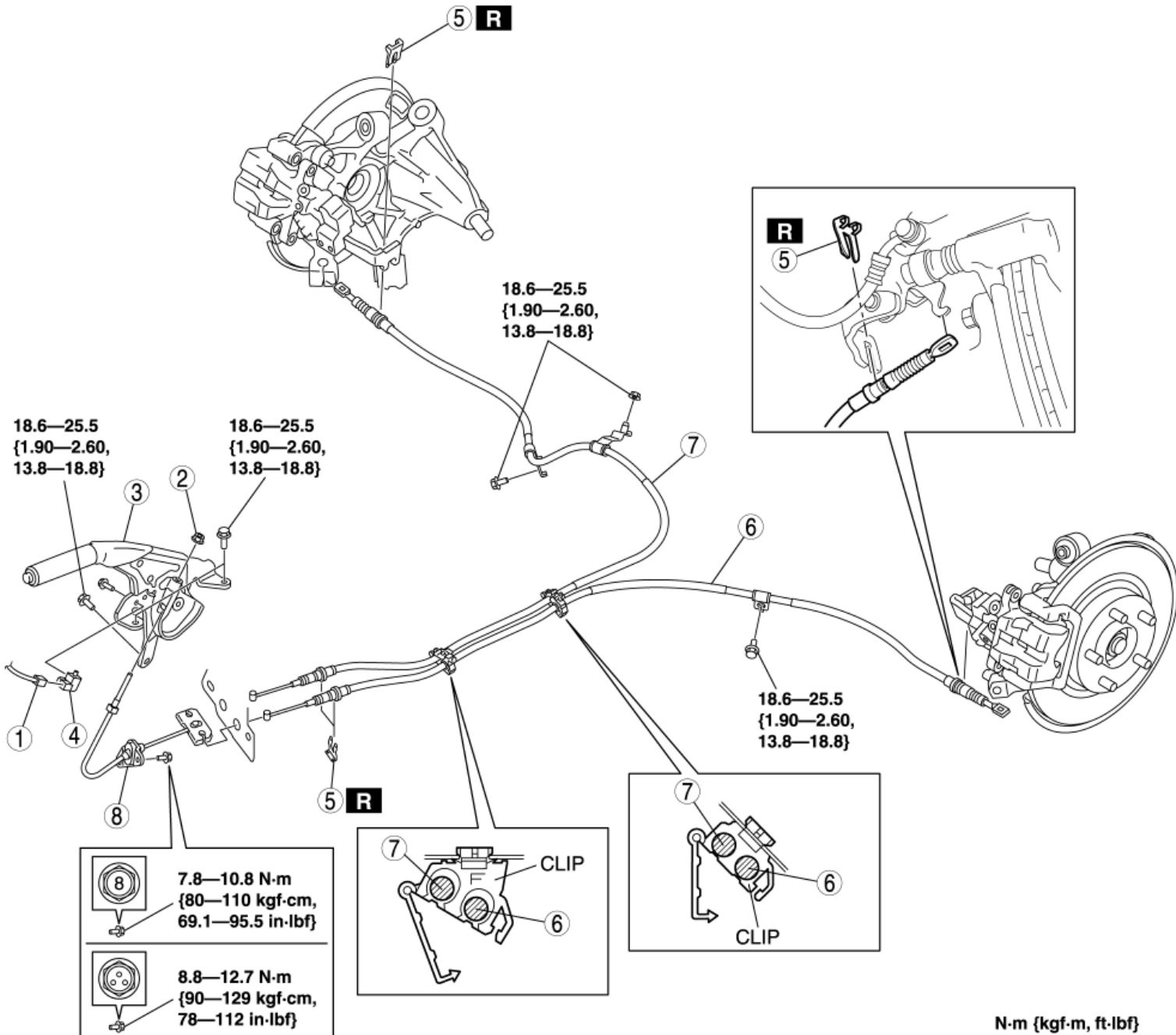


3. Turn the adjusting nut and adjust the parking brake lever.
4. After adjustment, pull the parking brake lever one notch and verify that the parking brake warning light illuminates.
5. Verify that the rear brakes do not drag.

## 2008 - MX-5 - Brakes

### PARKING BRAKE LEVER REMOVAL/INSTALLATION

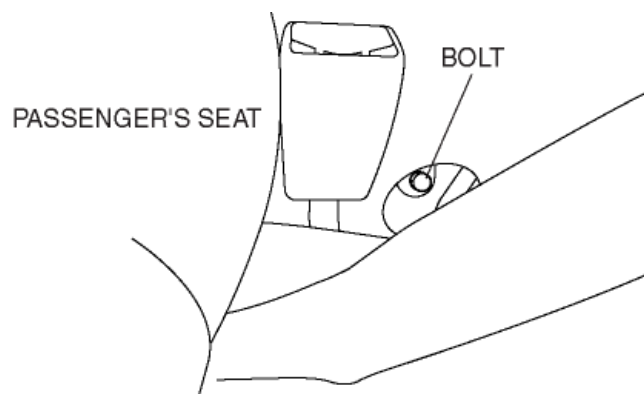
1. Remove the middle pipe. (See [EXHAUST SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
2. Remove the propeller shaft. (See [PROPELLER SHAFT REMOVAL/INSTALLATION](#).)
3. Remove the console. (See [CONSOLE REMOVAL/INSTALLATION](#).)
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. After installation, inspect the parking brake stroke and adjust if necessary.



1	Parking brake switch connector
2	Adjusting nut
3	Parking brake lever (See <a href="#">Parking Brake Lever Removal Note</a> .)
4	Parking brake switch
5	Clip
6	Rear parking brake cable (LH)
7	Rear parking brake cable (RH)
8	Front parking brake cable

### Parking Brake Lever Removal Note

1. Partially peel back the floor mat and remove the bolt shown in the figure.



2. Remove the two bolts.
3. Remove the parking brake lever.

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## 2008 - MX-5 - Brakes

### ABS SYSTEM INSPECTION

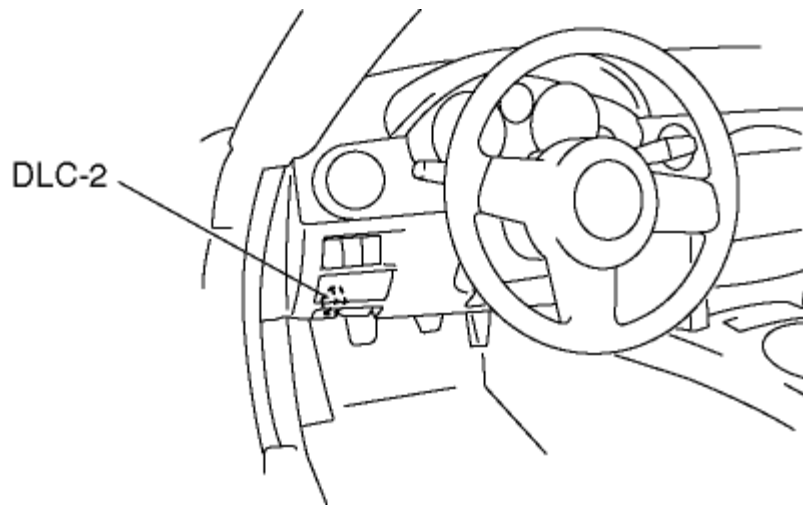
#### ABS Hydraulic Unit On-Vehicle Inspection

##### Preparation

1. Verify that battery is fully charged.
2. Turn the ignition switch to the ON position and verify that the ABS warning light goes out after **approx. 3 s**.
3. Turn the ignition switch off.
4. Jack up the vehicle and support it evenly on safety stands.
5. Shift to neutral.
6. Release the parking brake.
7. Verify that all four wheels rotate.
8. Rotate the wheels by hand, and verify there is no brake drag.
  - If there is any brake drag, perform regular brake inspection.
  - If there is no brake drag, perform ABS HU/CM operation inspection.

##### Operation inspection

1. Perform "Preparation".
2. Connect the M-MDS to the DLC-2.



3. Set up an active command mode inspection according to the combination of commands below.

Operation condition	Command name			Command transmission type
	PMP_MOTOR	RF_OUTLET	RF_INLET	
Brake pressure retention	OFF	OFF	ON	Manual
Brake pressure reduction	ON	ON	ON	

The chart above shows an example of a right front wheel inspection.

**CAUTION:**

- To protect the ABS HU/CM, the solenoid valve and the pump motor used during active command mode stay on for only 10 s or less each time they are switched on.

**NOTE:**

- When working with two people, one should press on the brake pedal, and the other should attempt to rotate the wheel being inspected.

4. Send the command while depressing the brake pedal and attempting to rotate the wheel being inspected.

5. Performing the inspection above determines the following:

- The ABS HU/CM brake lines are normal.
- The ABS HU/CM hydraulic system is not significantly abnormal (including inside ABS HU/CM).
- The ABS HU/CM internal electrical parts (solenoid, motor and other parts) are normal.
- The ABS HU/CM output system wiring harnesses (solenoid valve, relay system) are normal.

- However, the following items cannot be verified.
  - Malfunction of ABS HU/CM input system wiring harnesses and parts
  - Extremely small leaks in the ABS HU/CM internal hydraulic system
  - Malfunction with intermittent occurrence of the above items

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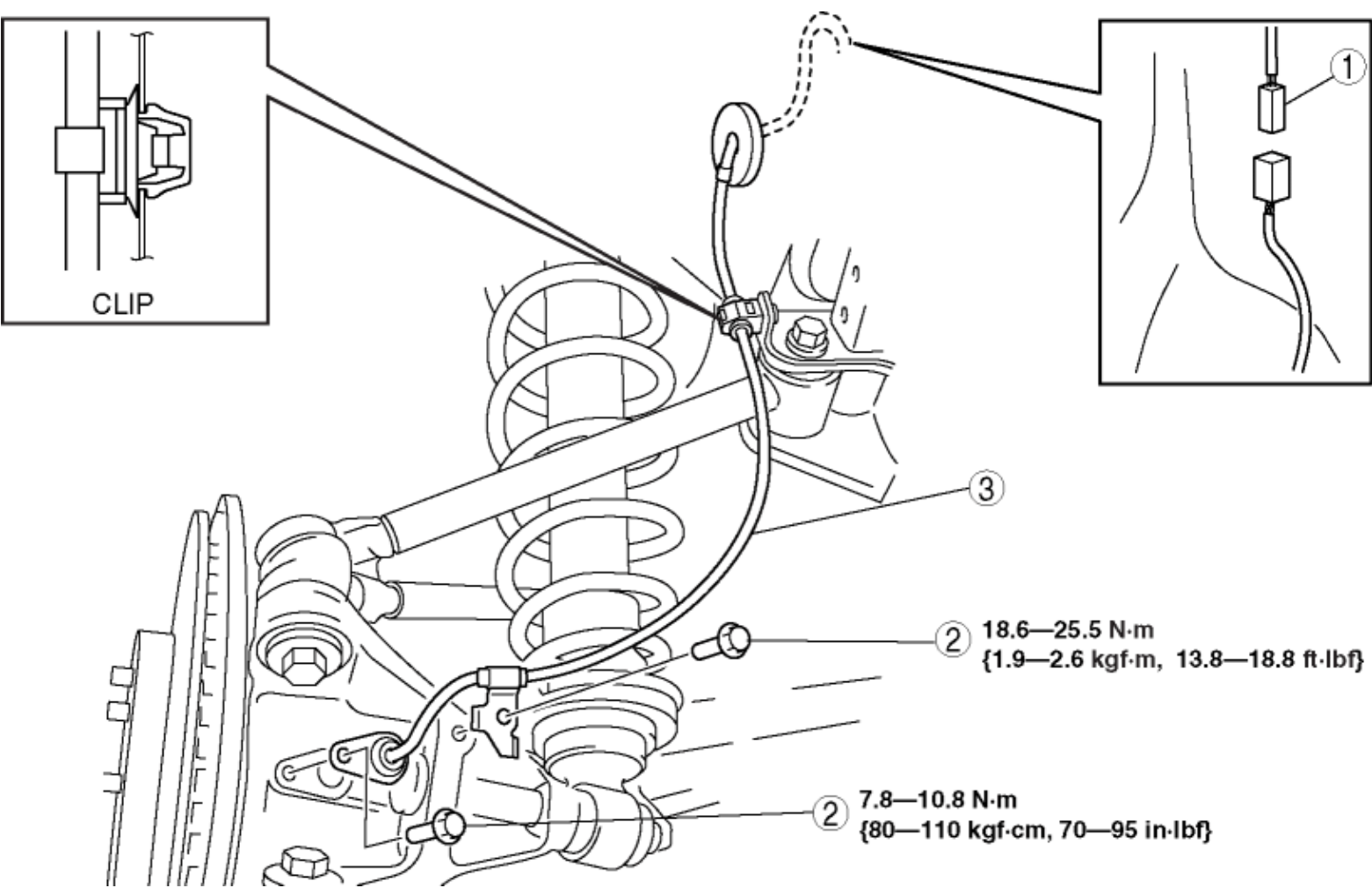
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2008 - MX-5 - Brakes

REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION

- 1. Remove the trunk end trim. (See [TRUNK END TRIM REMOVAL/INSTALLATION](#).)
- 2. Remove the partition board. (See [PARTITION BOARD REMOVAL/INSTALLATION](#).)
- 3. Remove the trunk side trim. (See [TRUNK SIDE TRIM REMOVAL/INSTALLATION](#).)
- 4. Remove the fuel-filler pipe protector. (See [FUEL TANK REMOVAL/INSTALLATION \[LF\]](#).)
- 5. Remove in the order indicated in the table.
- 6. Install in the reverse order of removal.



1	Connector
2	Bolt

3	Rear ABS wheel-speed sensor
---	-----------------------------

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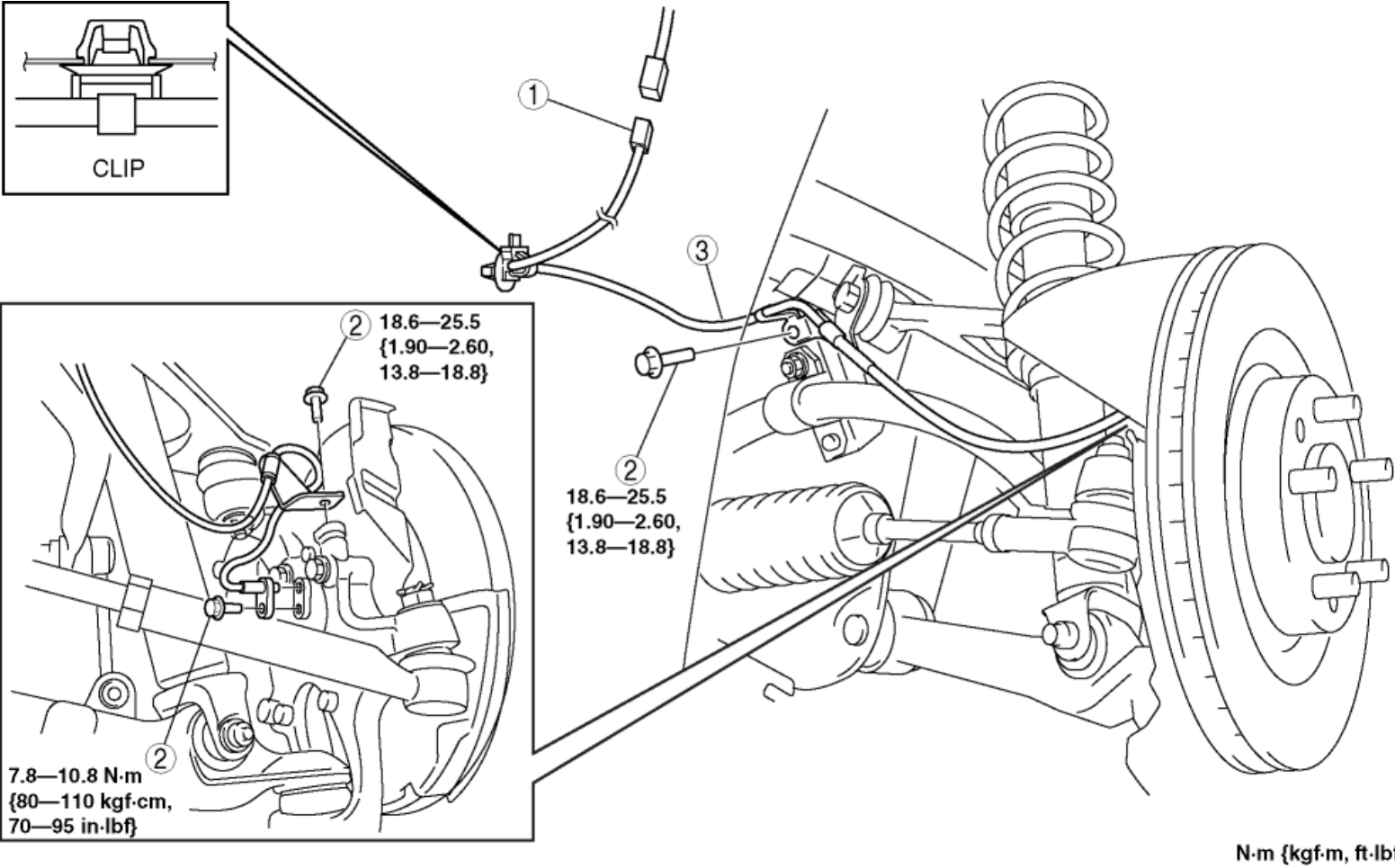
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2008 - MX-5 - Brakes

FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION

- 1. Remove the mudguard.
- 2. Remove in the order indicated in the table.
- 3. Install in the reverse order of removal.



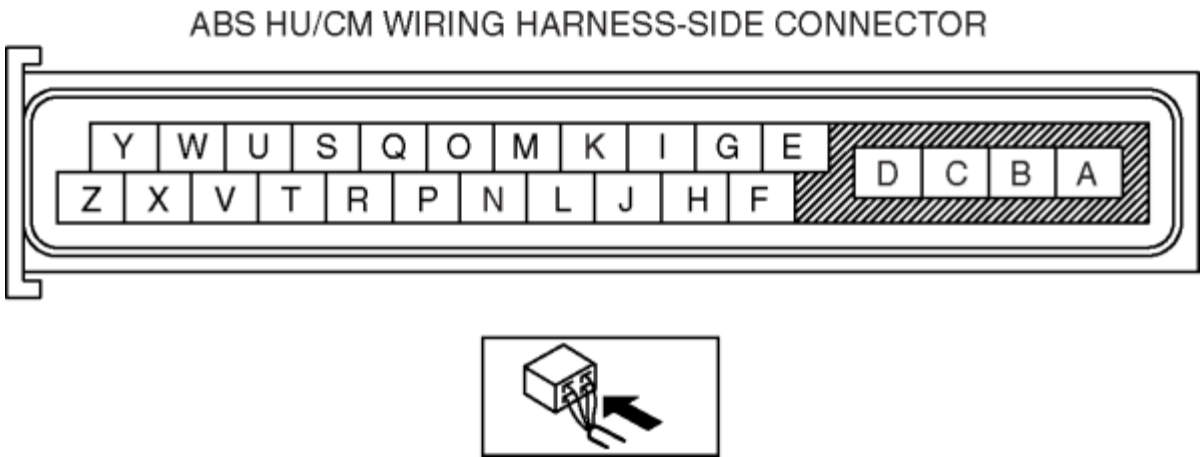
1	Connector
2	Bolt
3	Front ABS wheel-speed sensor

2008 - MX-5 - Brakes

ABS HU/CM INSPECTION

- 1. Disconnect the ABS HU/CM connector.
- 2. Connect the negative battery cable.
- 3. Attach the tester lead to the ABS HU/CM harness side connector, then inspect voltage, continuity or resistance according to the standard (reference value) on the table.

Standard (Reference Value)



Terminal	Signal name	Connected to	Measured item	Measured terminal (measured condition)	Standard	Inspection item(s)
A	Ground (ABS motor)	Ground point	Continuity	A—ground point	Continuity detected	<ul style="list-style-type: none"><li>Wiring harness (A—ground point)</li></ul>
B	Power supply (ABS motor operation)	Battery	Voltage	Under any condition	B+	<ul style="list-style-type: none"><li>Wiring harness (B—battery)</li></ul>
C	Power supply (solenoid)	Battery	Voltage	Under any condition	B+	<ul style="list-style-type: none"><li>Wiring harness (C—battery)</li></ul>
	Ground					<ul style="list-style-type: none"><li>Wiring harness</li></ul>

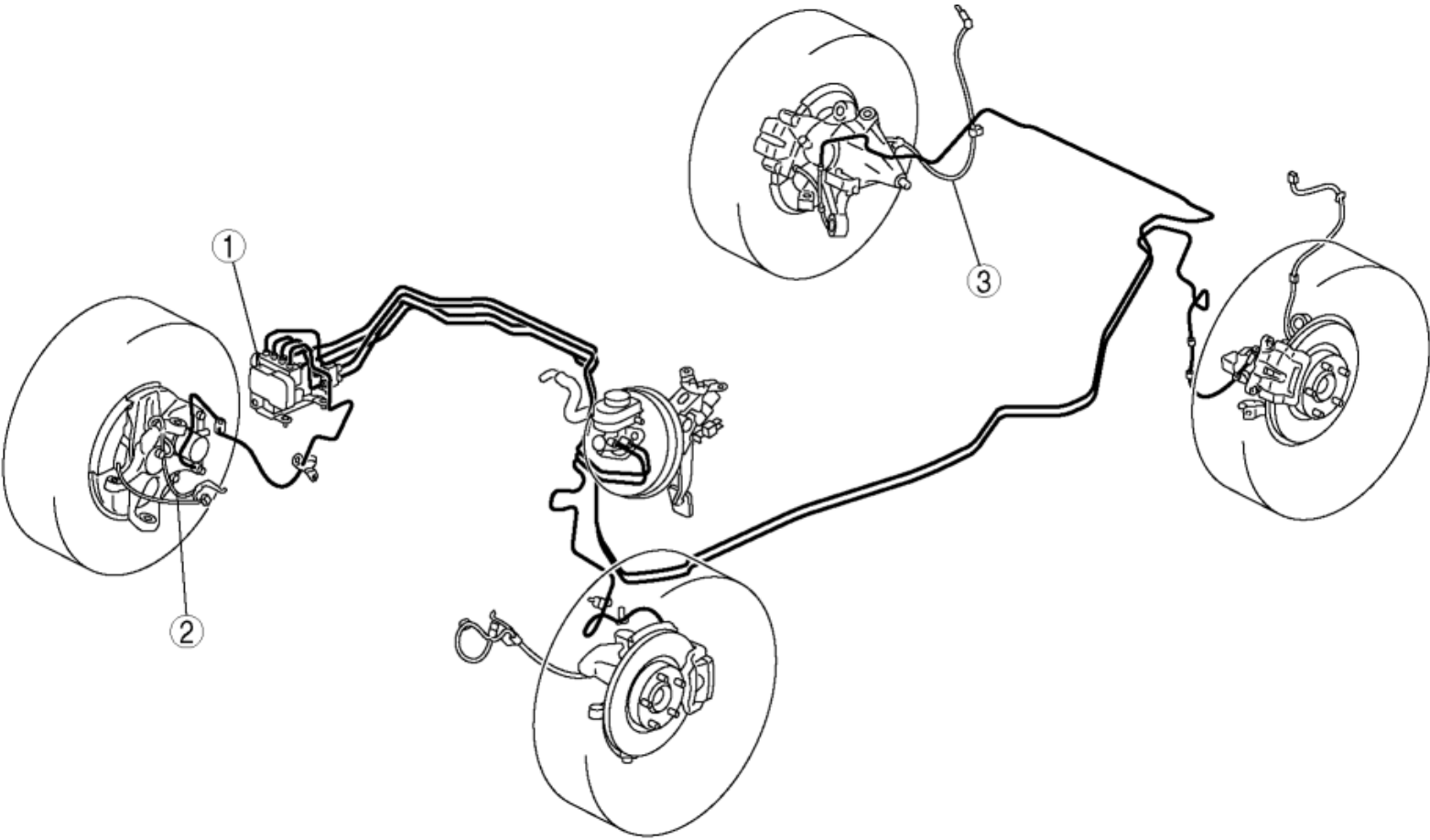
D	(ABS system)	Ground point	Continuity	D—ground point	Continuity detected	(D—ground point)
E	LF wheel-speed sensor (ground)	LF ABS wheel-speed sensor	Continuity	E—LF ABS wheel-speed sensor connector terminal B	Continuity detected	<ul style="list-style-type: none"><li>Wiring harness (E—LF ABS wheel-speed sensor connector terminal B)</li></ul>
F	LF wheel-speed sensor (single)	LF ABS wheel-speed sensor	Continuity	F—LF ABS wheel-speed sensor connector terminal A	Continuity detected	<ul style="list-style-type: none"><li>Wiring harness (F—LF ABS wheel-speed sensor connector terminal A)</li></ul>
G	LR wheel-speed sensor (signal)	LR ABS wheel-speed sensor	Continuity	G—LR ABS wheel-speed sensor connector terminal A	Continuity detected	<ul style="list-style-type: none"><li>Wiring harness (G—LR ABS wheel-speed sensor connector terminal A)</li></ul>
H	LR wheel-speed sensor (ground)	LR ABS wheel-speed sensor	Continuity	H—LR ABS wheel-speed sensor connector terminal B	Continuity detected	<ul style="list-style-type: none"><li>Wiring harness (H—LR ABS wheel-speed sensor connector terminal B)</li></ul>
I	RR wheel-speed sensor (signal)	RR ABS wheel-speed sensor	Continuity	I—RR ABS wheel-speed sensor connector terminal A	Continuity detected	<ul style="list-style-type: none"><li>Wiring harness (I—RR ABS wheel-speed sensor connector terminal A)</li></ul>
J	Power supply (system)	Ignition switch	Voltage	Ignition switch at ON	B+	<ul style="list-style-type: none"><li>Wiring harness (J—ignition switch)</li></ul>
				Ignition switch is off.	1 V or less	—
K	—	—	—	—	—	—
L	RR wheel-speed sensor	RR ABS wheel-speed	Continuity	L—RR ABS wheel-speed sensor	Continuity detected	<ul style="list-style-type: none"><li>Wiring harness (L—RR ABS wheel-speed sensor)</li></ul>

	(ground)	sensor		connector terminal B		connector terminal B)
M	RF wheel-speed sensor (signal)	RF ABS wheel-speed sensor	Continuity	M—RF ABS wheel-speed sensor connector terminal A	Continuity detected	<ul style="list-style-type: none"> <li>Wiring harness (M—RF ABS wheel-speed sensor connector terminal A)</li> </ul>
N	Brake switch	Brake switch	Voltage	N—brake switch (Brake pedal depressed)	B+	<ul style="list-style-type: none"> <li>Wiring harness (N—brake switch)</li> <li>Brake switch</li> </ul>
				Y—brake switch (Brake pedal not depressed)	1 V or less	
O	RF wheel-speed sensor (ground)	RF ABS wheel-speed sensor	Continuity	O—RF ABS wheel-speed sensor connector terminal B	Continuity detected	<ul style="list-style-type: none"> <li>Wiring harness (O—RF ABS wheel-speed sensor connector terminal B)</li> </ul>
P	—	—	—	—	—	—
Q	—	—	—	—	—	—
R	—	—	—	—	—	—
S	—	—	—	—	—	—
T	—	—	—	—	—	—
U	—	—	—	—	—	—
V	—	—	—	—	—	—
W	—	—	—	—	—	—
X	—	—	—	—	—	—
Y	CAN_L	DLC-2 (CAN_L)	Continuity	Y—DLC-2 terminal CAN_L	Continuity detected	<ul style="list-style-type: none"> <li>Wiring harness (Y—DLC-2 terminal</li> </ul>

						CAN_L)
Z	CAN_H	DLC-2 (CAN_H)	Continuity	Z—DLC-2 terminal CAN_H	Continuity detected	<ul style="list-style-type: none"><li>Wiring harness (Z—DLC-2 terminal CAN_H)</li></ul>

2008 - MX-5 - Brakes

ABS LOCATION INDEX



1	ABS HU/CM  (See <a href="#">ABS SYSTEM WIRING DIAGRAM.</a> )  (See <a href="#">ABS SYSTEM INSPECTION.</a> )  (See <a href="#">ABS HU/CM REMOVAL/INSTALLATION.</a> )  (See <a href="#">ABS CONFIGURATION.</a> )  (See <a href="#">ABS HU/CM INSPECTION.</a> )
2	Front ABS wheel-speed sensor  (See <a href="#">FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.</a> )  (See <a href="#">FRONT ABS WHEEL-SPEED SENSOR INSPECTION.</a> )
3	Rear ABS wheel-speed sensor  (See <a href="#">REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.</a> )  (See <a href="#">REAR ABS WHEEL-SPEED SENSOR INSPECTION.</a> )



## 2008 - MX-5 - Brakes

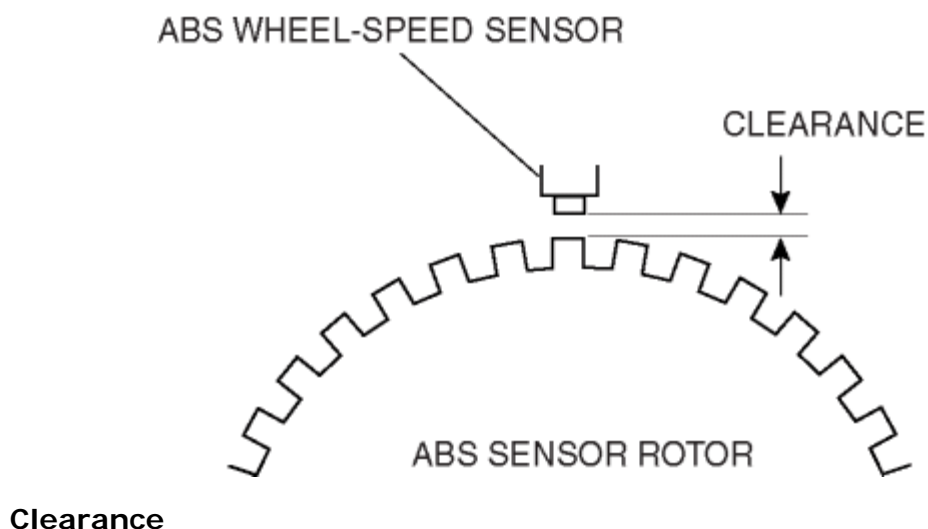
### REAR ABS WHEEL-SPEED SENSOR INSPECTION

#### Installation Visual Inspection

1. Inspect the following items:
  - If there is any malfunction, replace the applicable part.
  - a. Excessive looseness or play of the ABS wheel-speed sensor
  - b. Deformation of the ABS wheel-speed sensor
  - c. Deformation or damage of the ABS sensor rotor

#### Clearance Inspection

1. Verify the clearance between the ABS sensor rotor and the ABS wheel-speed sensor.
  - If there is any malfunction, check for improper installation, and replace if necessary.

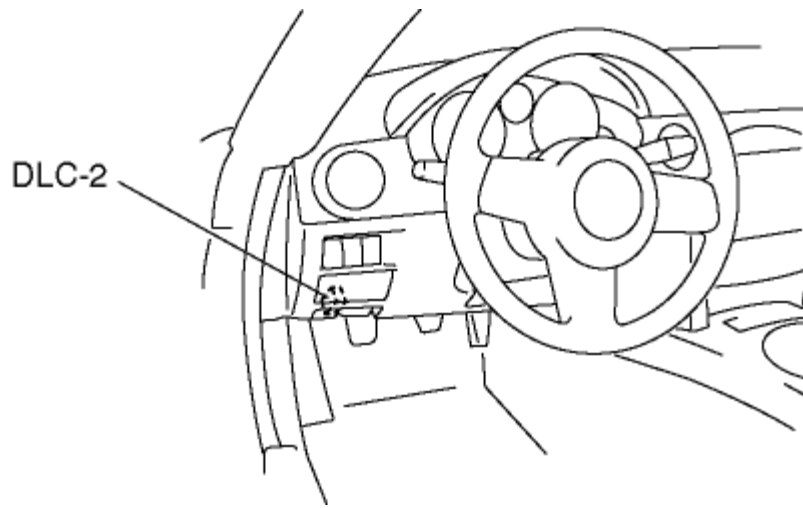


- 0.8—1.6 mm {0.032—0.062 in}

#### Sensor Output Value Inspection

1. Turn the ignition switch off.
2. Connect the M-MDS to the DLC-2.





3. Select the following PIDs using the M-MDS:

- LR\_WSPD  
(LR wheel-speed sensor)
- RR\_WSPD  
(RR wheel-speed sensor)

4. Start the engine and drive the vehicle.

5. Verify that the display of the M-MDS shows the same value as the speedometer.

- If there is any malfunction, replace the rear ABS wheel-speed sensor.

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## 2008 - MX-5 - Brakes

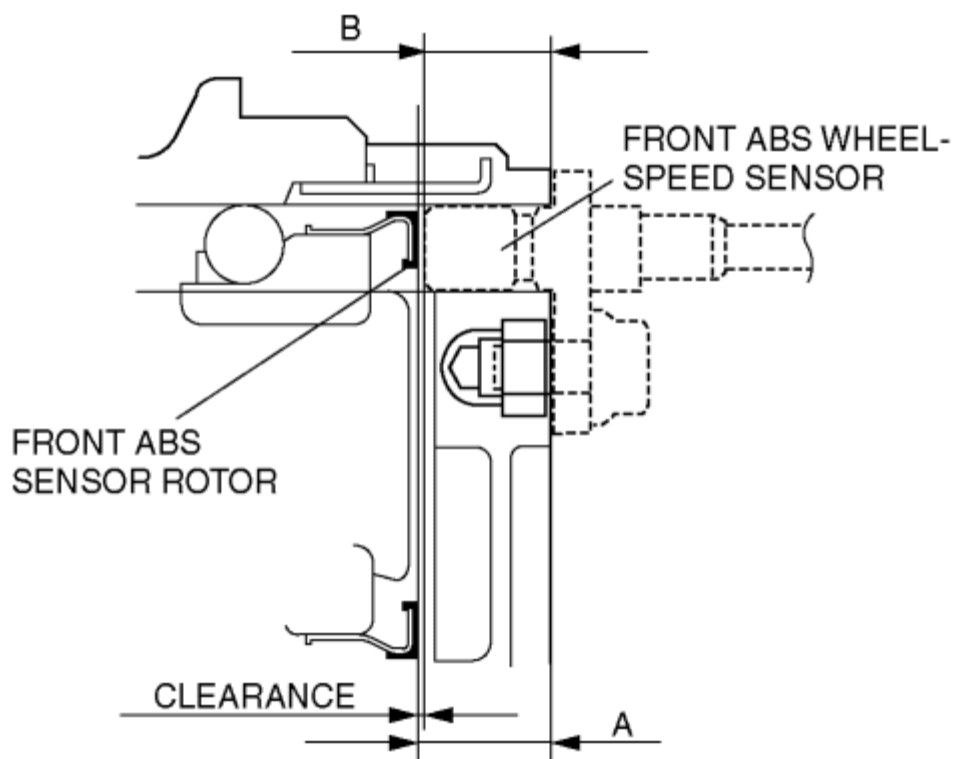
### FRONT ABS WHEEL-SPEED SENSOR INSPECTION

#### Installation Visual Inspection

1. Inspect the following items:
  - If there is any malfunction, replace the applicable part.
  - a. Excessive play of the ABS wheel-speed sensor
  - b. Deformation of the ABS wheel-speed sensor

#### Clearance Inspection

1. Remove the front ABS wheel-speed sensor.
2. Measure the distance between the front ABS wheel-speed sensor installation surface and the ABS sensor rotor. This is dimension A.
3. Measure the distance between the front ABS wheel-speed sensor installation surface and the tip of ABS wheel-speed sensor. This is dimension B.



4. Calculate the clearance between the front ABS wheel-speed sensor and the ABS sensor rotor

using the following formula:

- Clearance (mm {in}) = A – B

5. Verify that the clearance between the ABS sensor rotor and the front ABS wheel-speed sensor is as indicated below.

- If there is any malfunction, replace it.

#### **Clearance**

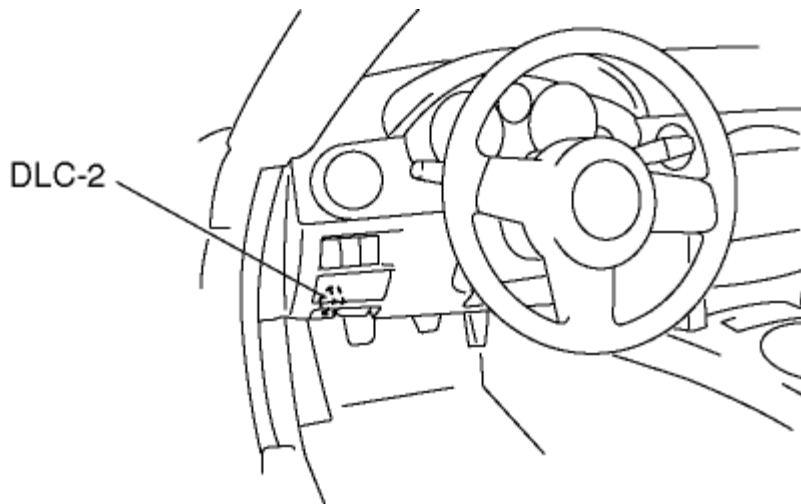
- 0.3—1.0 mm {0.012—0.057 in}

## **Sensor Output Value Inspection**

### **CAUTION:**

- Resistance inspection using other testers may cause damage to the ABS wheel-speed sensor internal circuit. Be sure to use the M-MDS to inspect the ABS wheel-speed sensor.

1. Turn the ignition switch off.
2. Connect the M-MDS to the DLC-2.



3. Select the following PIDs using the M-MDS:
  - LF\_WSPD  
(LF wheel-speed sensor)
  - RF\_WSPD  
(RF wheel-speed sensor)
4. Start the engine and drive the vehicle.
5. Verify that the display of the M-MDS shows the same value as the speedometer.
  - If there is any malfunction, replace the front ABS wheel-speed sensor.

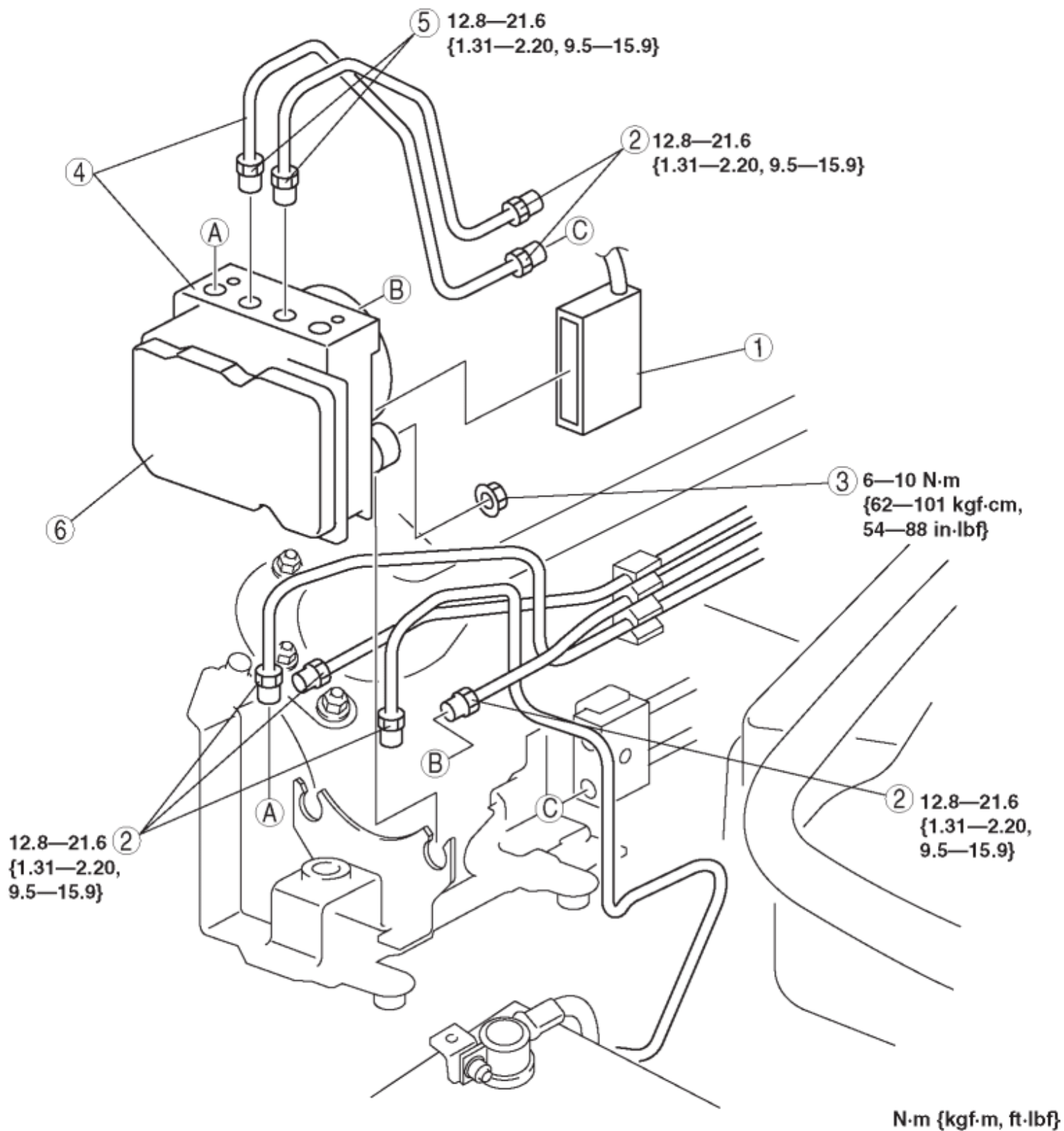


## 2008 - MX-5 - Brakes

### ABS HU/CM REMOVAL/INSTALLATION

#### CAUTION:

- When replacing the DSC HU/CM with a new one, configuration procedure must be performed before removing the DSC HU/CM. If configuration is not completed before removing the DSC HU/CM, DTC B2477 will be detected.
  - The internal parts of the ABS HU/CM could be damaged if dropped. Be careful not to drop the ABS HU/CM. Replace the ABS HU/CM if it is subjected to an impact.
1. Perform ABS configuration. (See [ABS CONFIGURATION](#).)
  2. Remove in the order indicated in the table.
  3. Install in the reverse order of removal.



1 ABS HU/CM connector

(See [ABS HU/CM Connector Removal Note.](#))

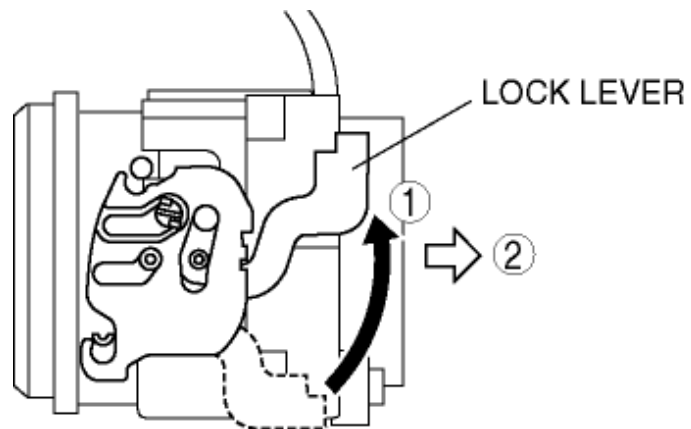
(See [ABS HU/CM Connector Installation Note.](#))

2 Brake pipe

	(See <b>Brake Pipe Removal Note.</b> )
	(See <b>Brake Pipe Installation Note.</b> )
3	Nut
4	ABS HU/CM, brake pipe
5	Brake pipe (ABS HU/CM—brake pipe joint) (See <b>Brake Pipe (ABS HU/CM—brake pipe joint) Installation Note.</b> )
6	ABS HU/CM

### ABS HU/CM Connector Removal Note

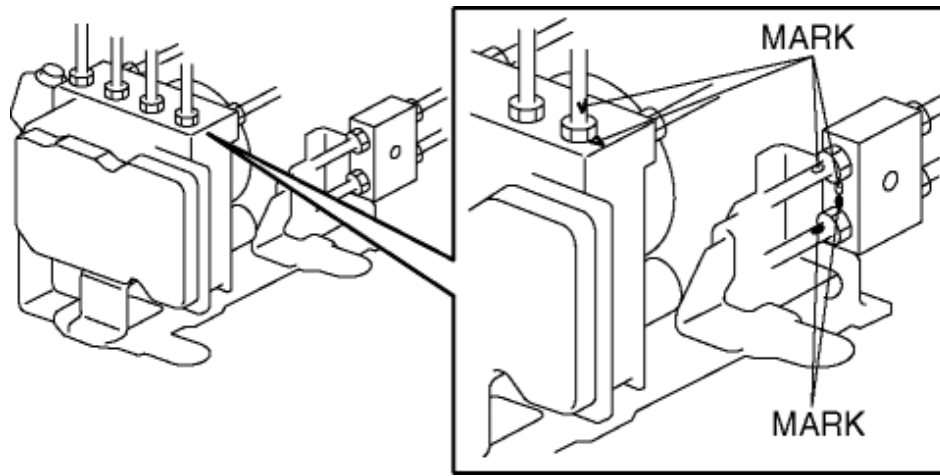
1. Pull the lock lever up in the direction of the arrow.



2. Pull the connector toward the vehicle rear and remove it.

### Brake Pipe Removal Note

1. Place an alignment mark on the brake pipe and ABS HU/CM.



2. Apply protective tape to the connector to prevent brake fluid from entering.
3. Remove the brake pipe.

### Brake Pipe (ABS HU/CM—brake pipe joint) Installation Note

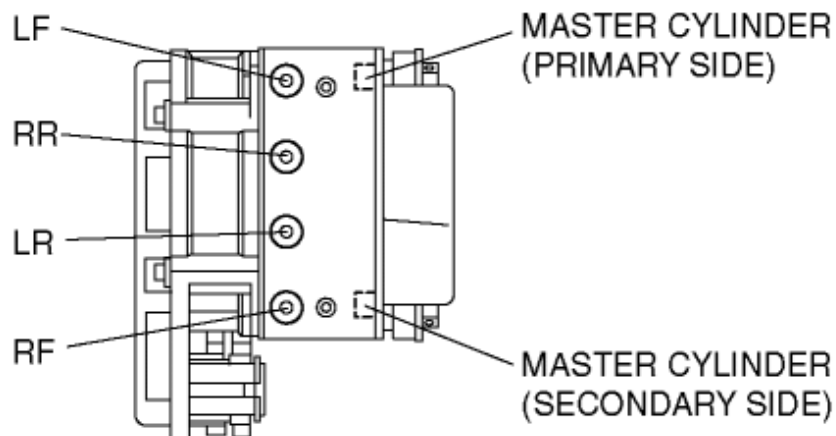
1. Align with the mark made before removing the brake pipe and temporarily install the brake pipe to the ABS HU/CM.

#### CAUTION:

- If the brake pipe is tightened to the specified torque, it may be difficult to install it to the vehicle. Therefore, only temporarily tighten the brake pipe so that it can still be moved.

### Brake Pipe Installation Note

1. Align the marks made before removal and install the brake pipe to the ABS HU/CM and brake pipe joint referring to the figure.

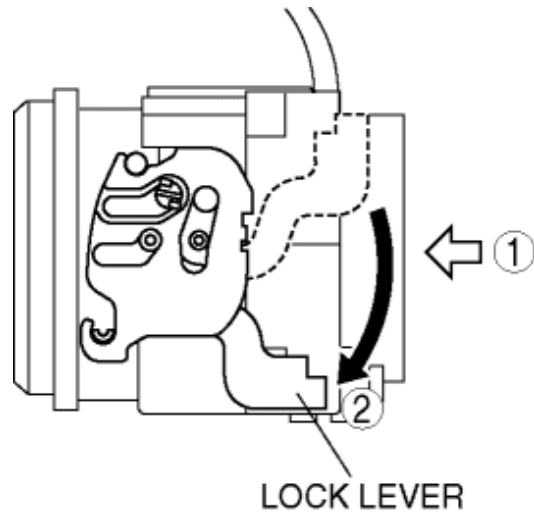


2. Tighten the brake pipe to the specified torque using the commercially available flare nut wrench.

### ABS HU/CM Connector Installation Note



1. After connecting the connector, verify that the lock lever is completely pushed in.



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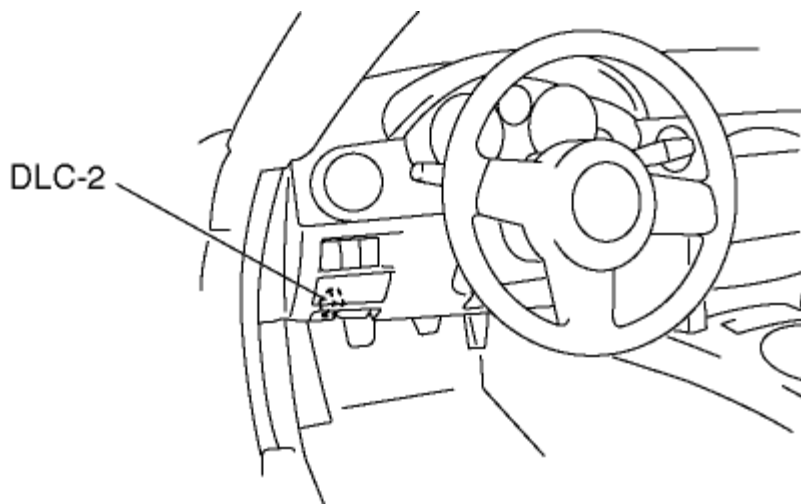
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## 2008 - MX-5 - Brakes

### ABS CONFIGURATION

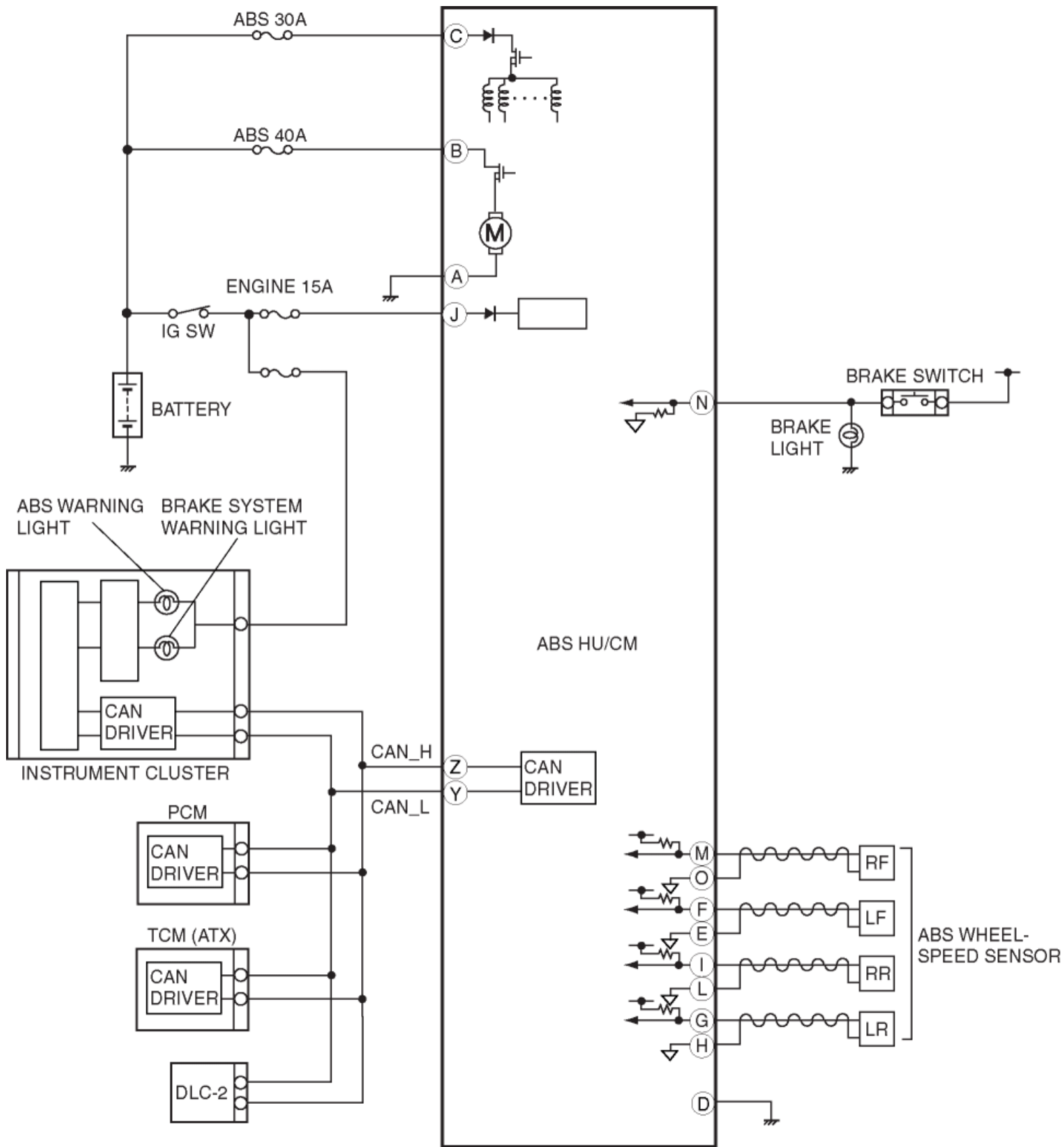
1. Connect the M-MDS to the DLC-2 connector.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.
  - When using the IDS (laptop PC)
    1. Select the "Module Programming".
  - When using the PDS (Pocket PC)
    1. Select "Programming".
    2. Select "Module Programming".
3. Then, select items from the screen menu in the following order.
  1. Select "Programmable Module Installation".
  2. Select "ABS".
4. Perform the configuration according to the directions on the screen.
5. Retrieve DTCs by the M-MDS, then verify that there is no DTC present.
  - If a DTC (s) is detected, perform the applicable DTC inspection. (See **ON-BOARD DIAGNOSIS[ABS]**.)

2008 - MX-5 - Brakes

ABS SYSTEM WIRING DIAGRAM



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## 2008 - MX-5 - Brakes

### REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION

1. Remove or install the rear ABS wheel-speed sensor in the same order of vehicles with ABS.  
(See [REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION](#).)

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## 2008 - MX-5 - Brakes

### REAR ABS WHEEL-SPEED SENSOR INSPECTION

1. Inspect the rear ABS wheel-speed sensor in the same order of vehicles with ABS. (See [REAR ABS WHEEL-SPEED SENSOR INSPECTION](#).)

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## 2008 - MX-5 - Brakes

### FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION

1. Remove or install the front ABS wheel-speed sensor in the same order of vehicles with ABS.  
(See [FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION](#).)

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## 2008 - MX-5 - Brakes

### FRONT ABS WHEEL-SPEED SENSOR INSPECTION

1. Inspect the front ABS wheel-speed sensor in the same order of vehicles with ABS. (See [FRONT ABS WHEEL-SPEED SENSOR INSPECTION](#).)

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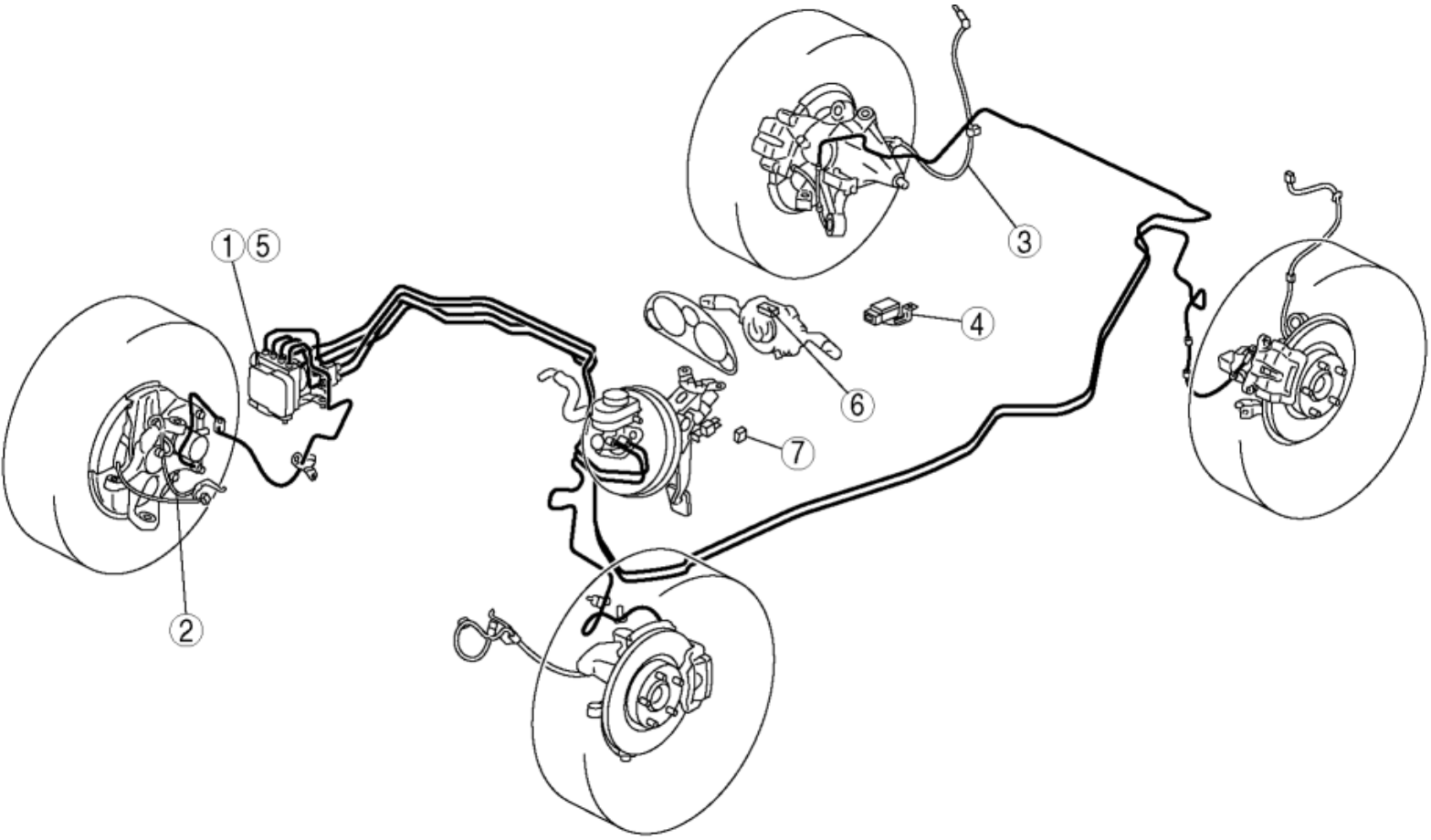
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2008 - MX-5 - Brakes

DYNAMIC STABILITY CONTROL LOCATION INDEX

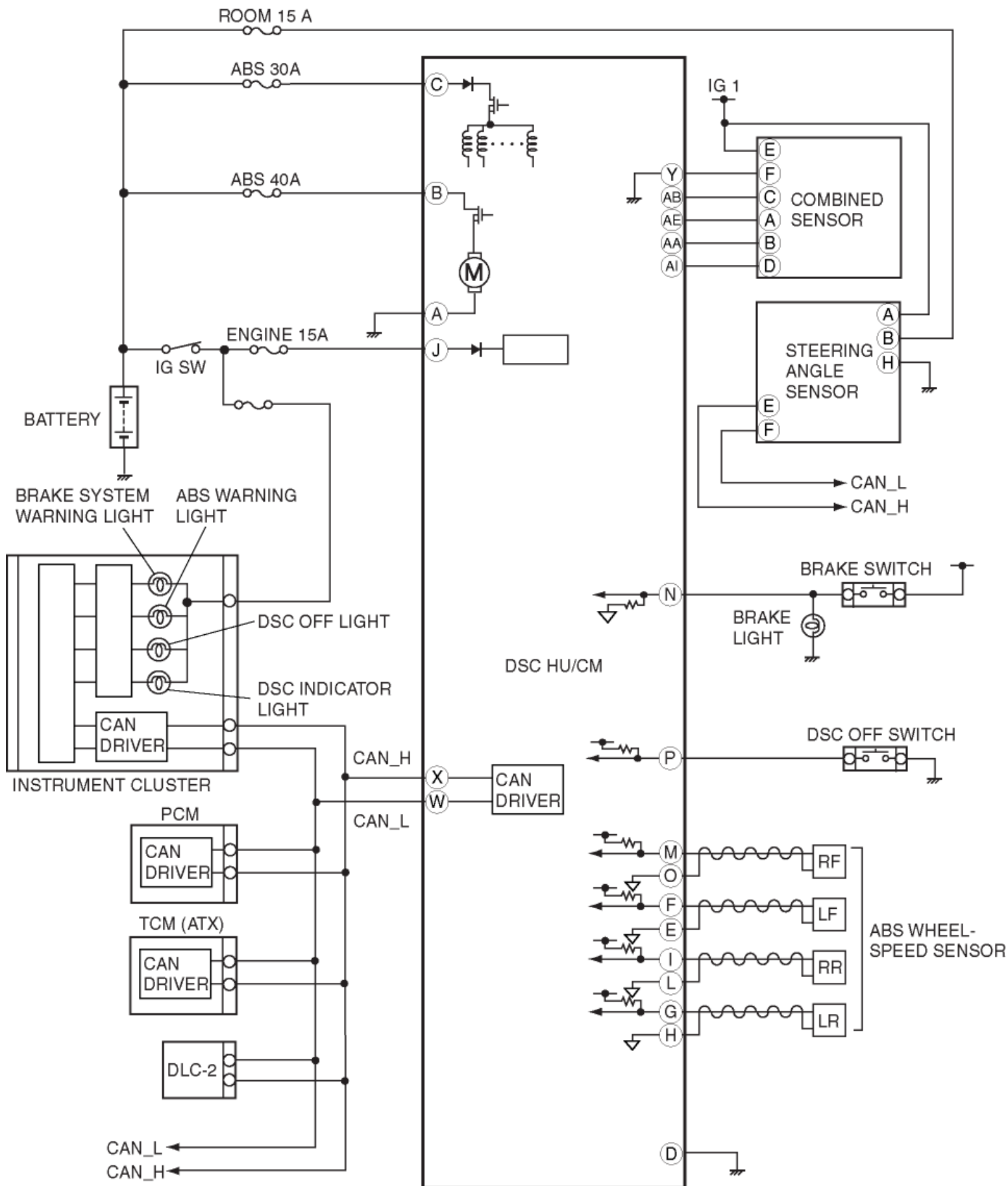


1	DSC HU/CM (See <a href="#">DSC SYSTEM WIRING DIAGRAM.</a> ) (See <a href="#">DSC SYSTEM INSPECTION.</a> ) (See <a href="#">DSC HU/CM REMOVAL/INSTALLATION.</a> ) (See <a href="#">DSC CONFIGURATION.</a> ) (See <a href="#">DSC HU/CM INSPECTION.</a> ) (See <a href="#">STEERING ANGLE SIGNAL INITIALIZATION PROCEDURE.</a> )
2	Front ABS wheel-speed sensor (See <a href="#">FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.</a> ) (See <a href="#">FRONT ABS WHEEL-SPEED SENSOR INSPECTION.</a> )
3	Rear ABS wheel-speed sensor (See <a href="#">REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.</a> )

	(See <a href="#">REAR ABS WHEEL-SPEED SENSOR INSPECTION.</a> )
4	Combined sensor  (See <a href="#">COMBINED SENSOR REMOVAL/INSTALLATION.</a> )  (See <a href="#">COMBINED SENSOR INSPECTION.</a> )  (See <a href="#">COMBINED SENSOR INITIALIZATION PROCEDURE.</a> )
5	Brake fluid pressure sensor (built-into DSC HU/CM)  (See <a href="#">BRAKE FLUID PRESSURE SENSOR INSPECTION.</a> )
6	Steering angle sensor  (See <a href="#">STEERING ANGLE SENSOR REMOVAL/INSTALLATION.</a> )  (See <a href="#">STEERING ANGLE SENSOR INSPECTION.</a> )  (See <a href="#">STEERING ANGLE SENSOR INITIALIZATION PROCEDURE.</a> )
7	DSC OFF switch  (See <a href="#">DSC OFF SWITCH INSPECTION.</a> )  (See <a href="#">DSC OFF SWITCH REMOVAL/INSTALLATION.</a> )

2008 - MX-5 - Brakes

DSC SYSTEM WIRING DIAGRAM





## 2008 - MX-5 - Brakes

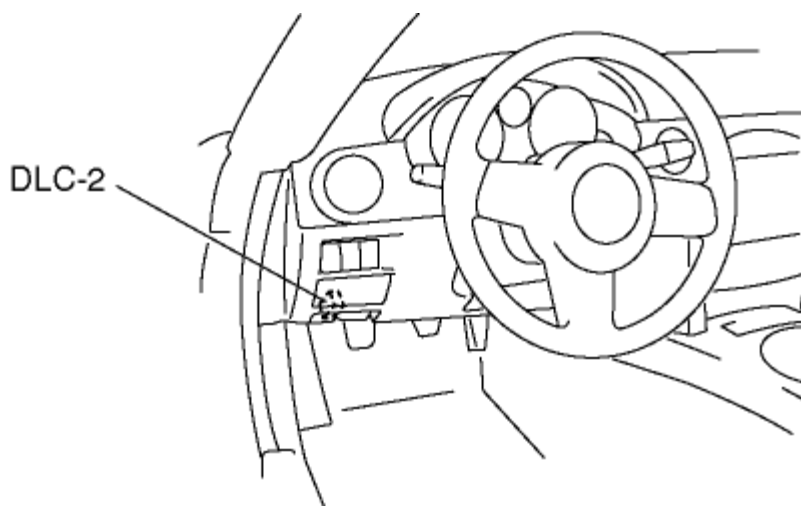
### DSC SYSTEM INSPECTION

#### Preparation

1. Verify that battery is fully charged.
2. Turn the ignition switch to the ON position, and verify that the ABS warning light goes out after **approx. 3 s**.
3. Turn the ignition switch off.
4. Jack up the vehicle and support it evenly on safety stands.
5. Shift to the N position.
6. Verify that all four wheels rotate.
7. Rotate the inspected wheels by hand, and verify there is no brake drag.
  - If there is any brake drag, perform regular brake inspection.
  - If there is no brake drag, perform DSC HU/CM operation inspection.

#### ABS Control Inspection

1. Perform "Preparation".
2. Connect the M-MDS to the DLC-2.



3. Set up an active command mode inspection according to the combination of commands below. **Brake pressure retention**

Command name	Inspected wheels					
	LF	RF	LR	RR		
V_TRC_L	OFF					
V_TRC_R						
V_STB_L						
V_STB_R						
LF_INLET	ON	OFF	OFF	OFF		
LF_OUTLET	OFF					
LR_INLET			ON			
LR_OUTLET						
RF_INLET	OFF	ON	OFF	ON		
RF_OUTLET						
RR_INLET		OFF				
RR_OUTLET						
PMP_MOTOR					OFF	

Brake pressure reduction

Command name	Inspected wheels			
	LF	RF	LR	RR
V_TRC_L	OFF			
V_TRC_R				
V_STB_L				
V_STB_R				

LF_INLET	ON		OFF	
LF_OUTLET				
LR_INLET		OFF		OFF
LR_OUTLET				
RF_INLET	OFF	ON		
RF_OUTLET				
RR_INLET		OFF	OFF	
RR_OUTLET				
PMP_MOTOR	ON			

#### CAUTION:

- To protect the DSC HU/CM, the solenoid valve and the pump motor used during active command mode stay on for only 10 s or less each time they are switched on.

#### NOTE:

- When working with two people, one should press on the brake pedal, and the other should attempt to rotate the wheel being inspected.

4. Send the command while depressing on the brake pedal and attempting to rotate the wheel being inspected.

5. While brake pressure is maintained and a DSC HU/CM operation click sound is heard, confirm that the wheel does not rotate. While brake pressure is being reduced and an DSC HU/CM operation click sound is heard, confirm that the wheel rotates.

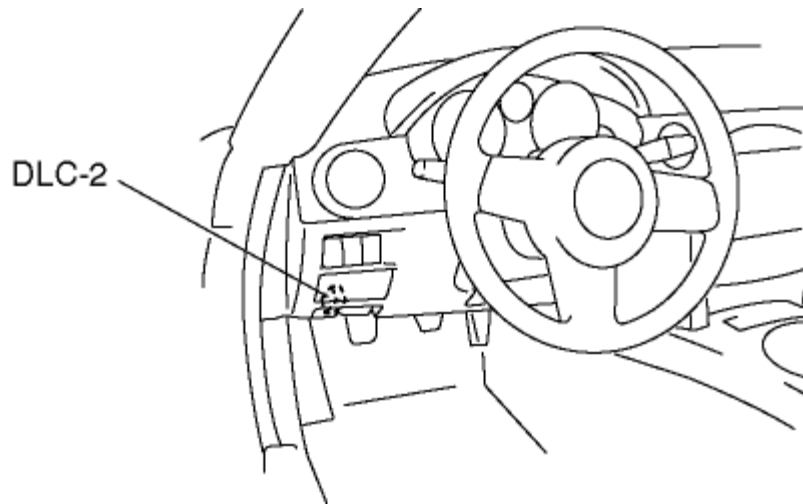
- Performing the inspection above determines the following:
  - The DSC HU/CM brake lines are normal.
  - The DSC HU/CM hydraulic system is not significantly abnormal (including DSC HU/CM).
  - The DSC HU/CM internal electrical parts (solenoid, motor and other parts) are normal.
  - The DSC unit and DSC HU/CM output system wiring harnesses (solenoid valve, relay system) are normal.
- However, the following items cannot be verified.
  - Malfunction with intermittent occurrence of the above items



- Malfunction of DSC HU/CM input system wiring harnesses and parts
- Extremely small leaks in the DSC HU/CM internal hydraulic system

## DSC Control Inspection

1. Perform "Preparation".
2. Connect the M-MDS to the DLC-2.



3. Set up an active command mode inspection according to the combination of commands below.

### CAUTION:

- To protect the DSC HU/CM, the solenoid valve and the pump motor used during active command mode stay on for only 10 s or less each time they are switched on.

Command name	Inspected wheels			
	Understeer control inhibited		Oversteer control inhibited	
	LF	RF	LR	RR
V_TRC_L	ON	OFF		ON
V_TRC_R	OFF	ON		OFF
V_STB_L	OFF			
V_STB_R				

LF_INLET	OFF	OFF	OFF	ON	
LF_OUTLET				ON	OFF
LR_INLET		ON			
LR_OUTLET		OFF			
RF_INLET				ON	
RF_OUTLET	OFF				
RR_INLET		ON	OFF		
RR_OUTLET	OFF	OFF			
PMP_MOTOR	ON				

4. Send the command while rotating the wheel being inspected by hand in a forward direction.

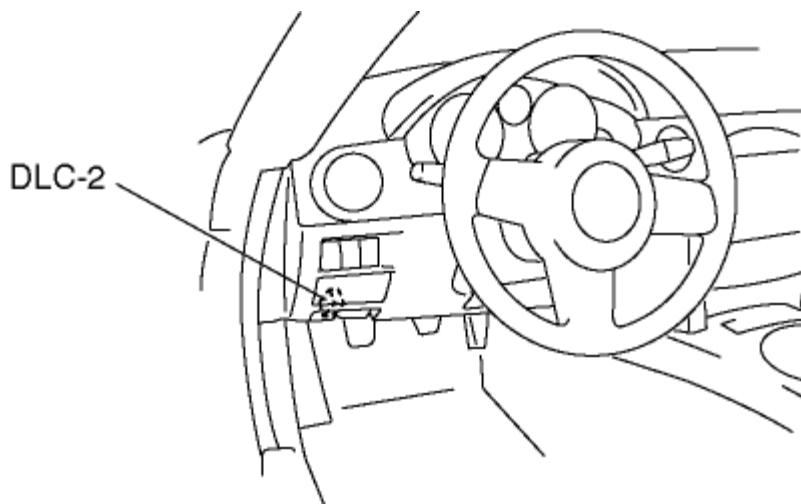
5. Confirm that the wheel does not rotate easily while a DSC HU/CM operation click sound is heard.

- Performing the inspection above determines the following:
  - The DSC HU/CM brake lines are normal.
  - The DSC HU/CM hydraulic system is not significantly abnormal (including DSC HU/CM).
  - The DSC HU/CM internal electrical parts (solenoid, motor and other parts) are normal.
  - The DSC unit and DSC HU/CM output system wiring harnesses (solenoid valve, relay system) are normal.
- However, the following items cannot be verified.
  - Malfunction with intermittent occurrence of the above items
  - Malfunction of DSC HU/CM input system wiring harnesses and parts
  - Extremely small leaks in the DSC HU/CM internal hydraulic system

## 2008 - MX-5 - Brakes

### DSC CONFIGURATION

1. Connect the M-MDS to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.
  - When using the IDS (laptop PC)
    1. Select the "Module Programming".
  - When using the PDS (Pocket PC)
    1. Select "Programming".
    2. Select "Module Programming".
3. Then, select items from the screen menu in the following order.
  - a. Select "Programmable Module Installation".
  - b. Select "ABS".
4. Perform the configuration according to the directions on the screen.
5. Retrieve DTCs by the M-MDS, then verify that there is no DTC present.
  - If a DTC (s) is detected, perform the applicable DTC inspection. (See **ON-BOARD DIAGNOSIS [DYNAMIC STABILITY CONTROL (DSC)]**.)

## 2008 - MX-5 - Brakes

### STEERING ANGLE SIGNAL INITIALIZATION PROCEDURE

#### WARNING:

- If the initialization procedure of the steering angle signal is not completed, the DSC will not operate properly and may cause an accident. Therefore, always perform initialization of the DSC HU/CM steering angle signal to ensure proper DSC operation when any of the following items are performed.
  - Steering angle sensor replacement
  - DSC HU/CM replacement

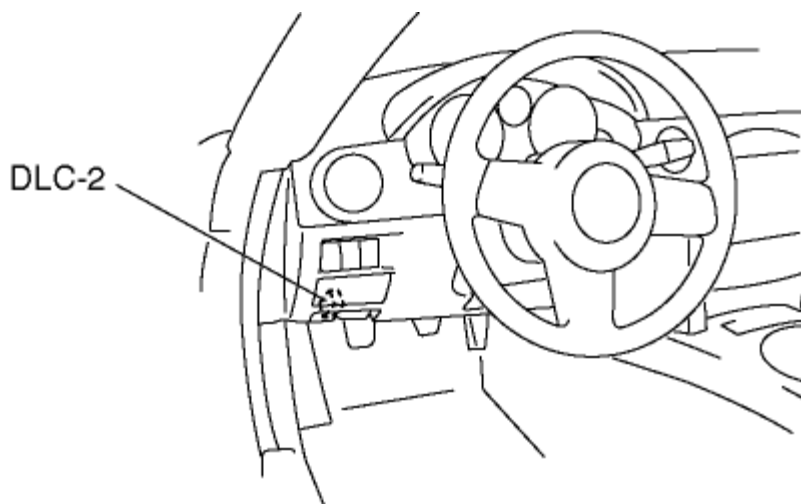
1. Inspect the wheel alignment and inflation pressure.

- If there is any malfunction, adjust the applicable part.

2. Park the vehicle on level ground.

3. Turn the ignition switch off.

4. Connect the M-MDS to the DLC-2.



5. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  - Select "Chassis".
  - Select "ABS/DSC".
  - Select "Sensor Initialization".
- When using the PDS (Pocket PC)
  - Select "All Tests and Calibrations".

- Select "Sensor Initialization".

6. Perform the initialization procedure according to the directions on the screen.

7. Drive the vehicle forward.

8. After 5 min of driving, verify that the DSC system is normal.

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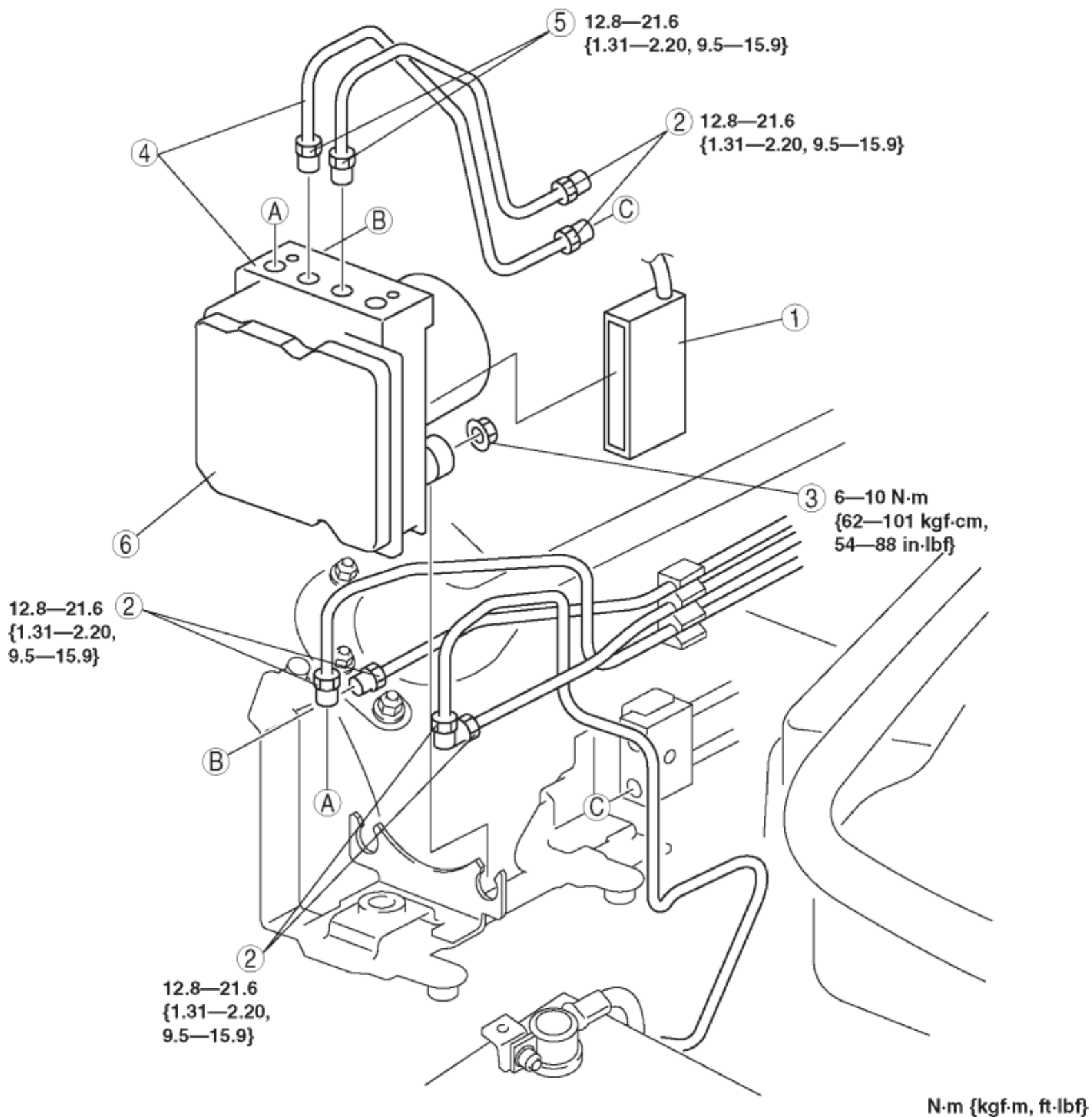
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## 2008 - MX-5 - Brakes

### DSC HU/CM REMOVAL/INSTALLATION

#### CAUTION:

- When replacing the DSC HU/CM with a new one, configuration procedure must be performed before removing the DSC HU/CM. If configuration is not completed before removing the DSC HU/CM, DTC B2477 will be detected.
  - The DSC may not function normally when the DSC HU/CM is replaced. After installation, always perform the initialization procedures for the DSC HU/CM, combined sensor and the steering angle sensor. (See **COMBINED SENSOR INITIALIZATION PROCEDURE.**) (See **STEERING ANGLE SENSOR INITIALIZATION PROCEDURE.**) (See **STEERING ANGLE SIGNAL INITIALIZATION PROCEDURE.**)
  - The internal parts of the DSC HU/CM could be damaged if dropped. Be careful not to drop the DSC HU/CM. Replace the DSC HU/CM if it is subjected to an impact.
1. Perform DSC configuration. (See **DSC CONFIGURATION.**)
  2. Remove in the order indicated in the table.
  3. Install in the reverse order of removal.
  4. After installation, perform the combined sensor initialization procedure. (See **COMBINED SENSOR INITIALIZATION PROCEDURE.**)
  5. After installation, perform the steering angle sensor initialization procedure. (See **STEERING ANGLE SENSOR INITIALIZATION PROCEDURE.**)
  6. After installation, perform the steering angle signal initialization procedure. (See **STEERING ANGLE SIGNAL INITIALIZATION PROCEDURE.**)



1 DSC HU/CM connector

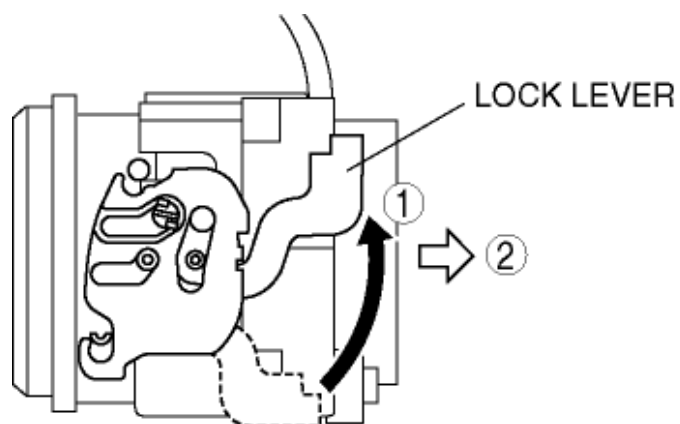
(See [DSC HU/CM Connector Removal Note.](#))

(See [DSC HU/CM Connector Installation Note.](#))

2	Brake pipe (See <a href="#">Brake Pipe Removal Note.</a> ) (See <a href="#">Brake Pipe Installation Note.</a> )
3	Nut
4	DSC HU/CM, brake pipe
5	Brake pipe (DSC HU/CM—brake pipe joint) (See <a href="#">Brake Pipe (DSC HU/CM—brake pipe joint) Installation Note.</a> )
6	ABS HU/CM

### DSC HU/CM Connector Removal Note

1. Pull the lock lever up in the direction of the arrow.

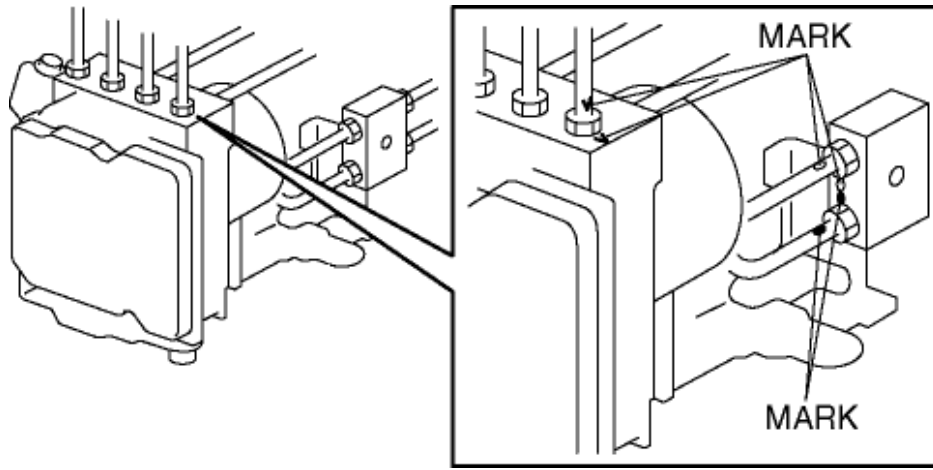


2. Pull the connector toward the vehicle rear and remove it.

### Brake Pipe Removal Note

1. Place an alignment mark on the brake pipe and DSC HU/CM.





2. Apply protective tape to the connector to prevent brake fluid from entering.
3. Remove the brake pipe.

### Brake Pipe (DSC HU/CM—brake pipe joint) Installation Note

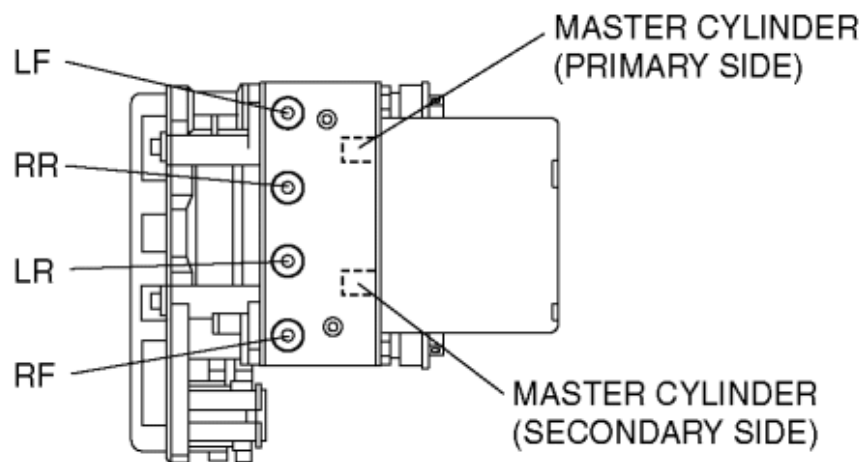
1. Align with the mark made before removing the brake pipe and temporarily install the brake pipe to the DSC HU/CM.

#### CAUTION:

- If the brake pipe is tightened to the specified torque, it may be difficult to install it to the vehicle. Therefore, only temporarily tighten the brake pipe so that it can still be moved.

### Brake Pipe Installation Note

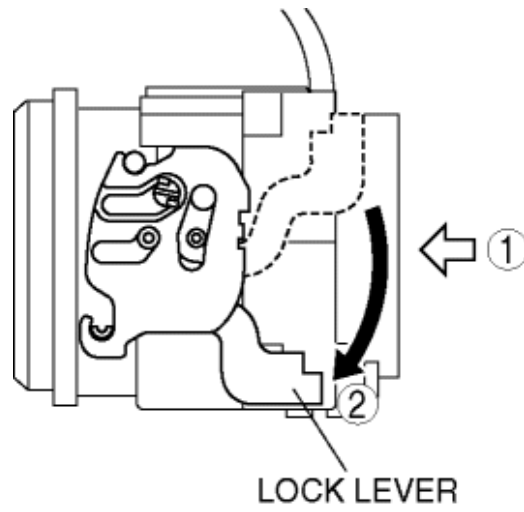
1. Align the marks made before removal and install the brake pipe to the DSC HU/CM and brake pipe joint referring to the figure.



2. Tighten the brake pipe to the specified torque using the commercially available flare nut wrench.

### DSC HU/CM Connector Installation Note

1. After connecting the connector, verify that the lock lever is completely pushed in.



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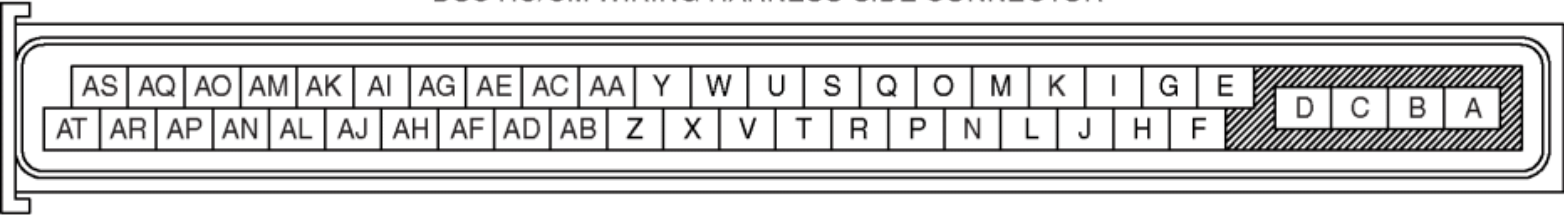
2008 - MX-5 - Brakes

DSC HU/CM INSPECTION

- 1. Disconnect the DSC HU/CM connector. (See [DSC HU/CM REMOVAL/INSTALLATION](#).)
- 2. Connect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
- 3. Attach the tester lead to the DSC HU/CM harness side connector, then inspect voltage, continuity or resistance according to the standard (reference value) on the table.

Standard (Reference Value)

DSC HU/CM WIRING HARNESS-SIDE CONNECTOR



Terminal	Signal name	Connected to	Measured item	Measured terminal (measured condition)	Standard	Inspection item(s)
A	Ground (ABS motor)	Ground point	Continuity	A—ground point	Continuity detected	<ul style="list-style-type: none"><li>Wiring harness (A—ground point)</li></ul>
B	Power supply (ABS motor operation)	Battery	Voltage	Under any condition	B+	<ul style="list-style-type: none"><li>Wiring harness (B—battery)</li></ul>
C	Power supply (solenoid operation)	Battery	Voltage	Under any condition	B+	<ul style="list-style-type: none"><li>Wiring harness (C—battery)</li></ul>
D	Ground (DSC system)	Ground point	Continuity	D—ground point	Continuity detected	<ul style="list-style-type: none"><li>Wiring harness (D—ground point)</li></ul>
E	LF wheel-speed sensor (ground)	LF ABS wheel-speed sensor	Continuity	E—LF ABS wheel-speed sensor connector terminal B	Continuity detected	<ul style="list-style-type: none"><li>Wiring harness (E—LF ABS wheel-speed sensor connector terminal B)</li></ul>
F	LF wheel-speed sensor (single)	LF ABS wheel-speed sensor	Continuity	F—LF ABS wheel-speed sensor connector terminal A	Continuity detected	<ul style="list-style-type: none"><li>Wiring harness (F—LF ABS wheel-speed sensor connector terminal A)</li></ul>

G	LR wheel-speed sensor (signal)	LR ABS wheel-speed sensor	Continuity	G—LR ABS wheel-speed sensor connector terminal A	Continuity detected	<ul style="list-style-type: none"> <li>Wiring harness (G—LR ABS wheel-speed sensor connector terminal A)</li> </ul>
H	LR wheel-speed sensor (ground)	LR ABS wheel-speed sensor	Continuity	H—LR ABS wheel-speed sensor connector terminal B	Continuity detected	<ul style="list-style-type: none"> <li>Wiring harness (H—LR ABS wheel-speed sensor connector terminal B)</li> </ul>
I	RR wheel-speed (signal)	RR ABS wheel-speed sensor	Continuity	I—RR ABS wheel-speed sensor connector terminal A	Continuity detected	<ul style="list-style-type: none"> <li>Wiring harness (I—RR ABS wheel-speed sensor connector terminal A)</li> </ul>
J	Power supply (system)	Ignition switch	Voltage	Ignition switch at ON	B+	<ul style="list-style-type: none"> <li>Wiring harness (J—ignition switch)</li> </ul>
				Ignition switch is off.	1 V or less	—
K	—	—	—	—	—	—
L	RR wheel-speed sensor (ground)	RR ABS wheel-speed sensor	Continuity	L—RR ABS wheel-speed sensor connector terminal B	Continuity detected	<ul style="list-style-type: none"> <li>Wiring harness (L—RR ABS wheel-speed sensor connector terminal B)</li> </ul>
M	RF wheel-speed sensor (signal)	RF ABS wheel-speed sensor	Continuity	M—RF ABS wheel-speed sensor connector terminal A	Continuity detected	<ul style="list-style-type: none"> <li>Wiring harness (M—RF ABS wheel-speed sensor connector terminal A)</li> </ul>
N	Brake switch	Brake switch	Voltage	N—ground point (Brake pedal depressed)	B+	<ul style="list-style-type: none"> <li>Wiring harness (N—brake switch)</li> <li>Brake switch</li> </ul>
				N—ground point (Brake pedal not depressed)	1 V or less	—
O	RF wheel-speed sensor (ground)	RF ABS wheel-speed sensor	Continuity	O—RF ABS wheel-speed sensor connector terminal B	Continuity detected	<ul style="list-style-type: none"> <li>Wiring harness (O—RF ABS wheel-speed sensor connector terminal B)</li> </ul>
P	DSC OFF switch	DSC OFF switch	Continuity	P—DSC OFF switch connector terminal A	Continuity detected	<ul style="list-style-type: none"> <li>Wiring harness (P—DSC OFF switch connector terminal A)</li> </ul>
Q	—	—	—	—	—	—
R	—	—	—	—	—	—
S	—	—	—	—	—	—
T	—	—	—	—	—	—
U	—	—	—	—	—	—
V	—	—	—	—	—	—

W	CAN_L	DLC-2 (CAN_L)	Continuity	W—DLC-2 terminal CAN_L	Continuity detected	<ul style="list-style-type: none"><li>Wiring harness (W—DLC-2 terminal CAN_L)</li></ul>
X	CAN_H	DLC-2 (CAN_H)	Continuity	X—DLC-2 terminal CAN_H	Continuity detected	<ul style="list-style-type: none"><li>Wiring harness (X—DLC-2 terminal CAN_H)</li></ul>
Y	Ground (combined sensor)	Combined sensor	Continuity	Y—combined sensor connector terminal F	Continuity detected	<ul style="list-style-type: none"><li>Wiring harness (Y—combined sensor connector terminal F)</li></ul>
Z	—	—	—	—	—	—
AA	Yaw rate (signal)	Combined sensor	Continuity	AA—combined sensor connector terminal B	Continuity detected	<ul style="list-style-type: none"><li>Wiring harness (AA—combined sensor connector terminal B)</li></ul>
AB	Yaw rate (test signal)	Combined sensor	Continuity	AB—combined sensor connector terminal C	Continuity detected	<ul style="list-style-type: none"><li>Wiring harness (AB—combined sensor connector terminal C)</li></ul>
AC	—	—	—	—	—	—
AD	—	—	—	—	—	—
AE	Yaw rate (reference signal)	Combined sensor	Continuity	AE—combined sensor connector terminal A	Continuity detected	<ul style="list-style-type: none"><li>Wiring harness (AE—combined sensor connector terminal A)</li></ul>
AF	—	—	—	—	—	—
AG	—	—	—	—	—	—
AH	—	—	—	—	—	—
AI	Lateral-G (signal)	Combined sensor	Continuity	AI—combined sensor connector terminal D	Continuity detected	<ul style="list-style-type: none"><li>Wiring harness (AI—combined sensor connector terminal D)</li></ul>
AJ	—	—	—	—	—	—
AK	—	—	—	—	—	—
AL	—	—	—	—	—	—
AM	—	—	—	—	—	—
AN	—	—	—	—	—	—
AO	—	—	—	—	—	—
AP	—	—	—	—	—	—
AQ	—	—	—	—	—	—

AR	—	—	—	—	—	—
AS	—	—	—	—	—	—
AT	—	—	—	—	—	—

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## 2008 - MX-5 - Brakes

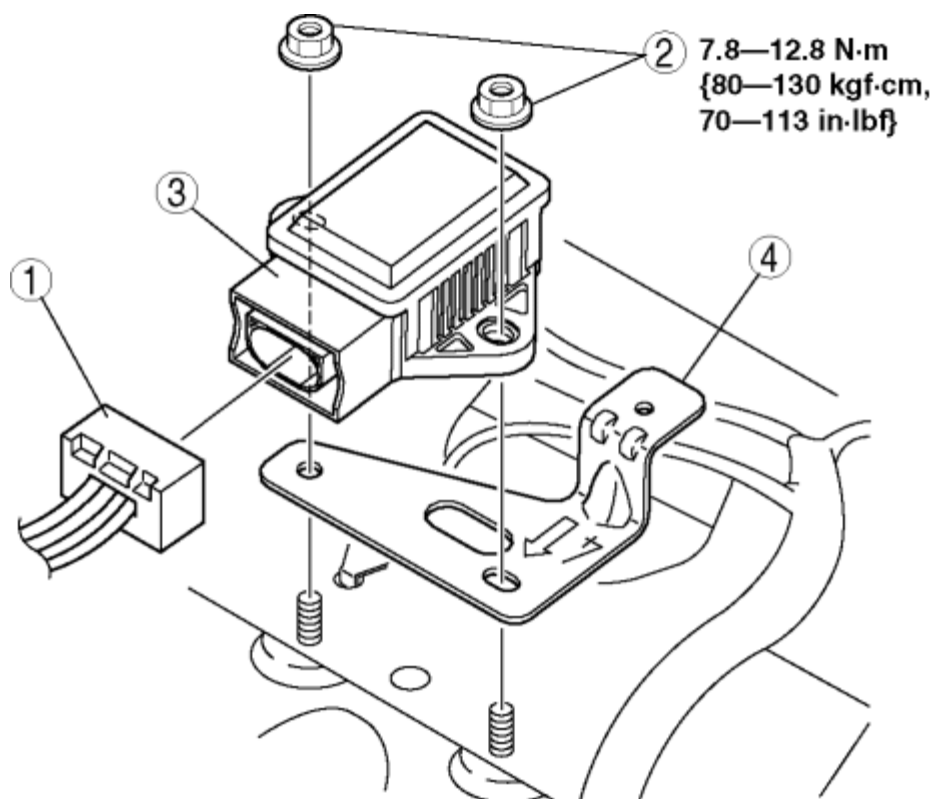
### COMBINED SENSOR REMOVAL/INSTALLATION

#### CAUTION:

- The internal parts of the combined sensor could be damaged if dropped. Be careful not to drop the combined sensor. Replace the combined sensor if it is subjected to an impact. Also, do not use an impact wrench or other similar air tools when removing/installing the sensor.

1. Remove the console. (See [CONSOLE REMOVAL/INSTALLATION](#).)

2. Remove in the order indicated in the table.



1	Combined sensor connector
2	Nut
3	Combined sensor
4	Bracket

3. Install in the reverse order of removal.

4. After installation, perform the combined sensor initialization procedure. (See **COMBINED SENSOR INITIALIZATION PROCEDURE**.)

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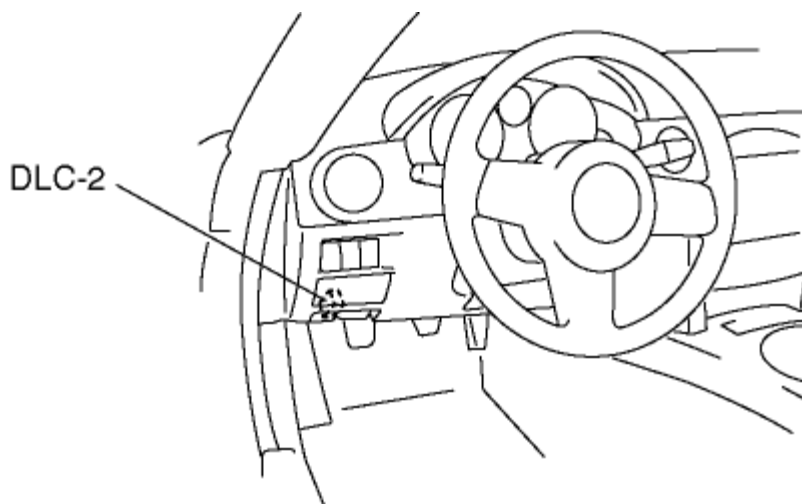
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## 2008 - MX-5 - Brakes

### COMBINED SENSOR INSPECTION

1. Turn the ignition switch off.
2. Connect the M-MDS to the DLC-2.

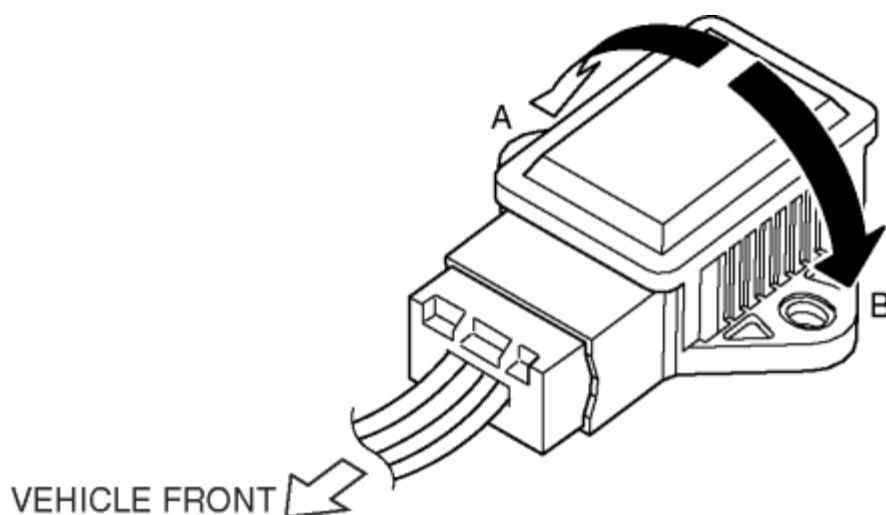


3. Select the following PIDs, then inspect the lateral acceleration speed and the yaw rate.

- LAT\_ACCL: (lateral acceleration speed)
- YAW\_RATE: (yaw rate)

a. Lateral acceleration speed inspection

- i. Verify the LAT\_ACCL change when the combined sensor is tilted to the left and right.



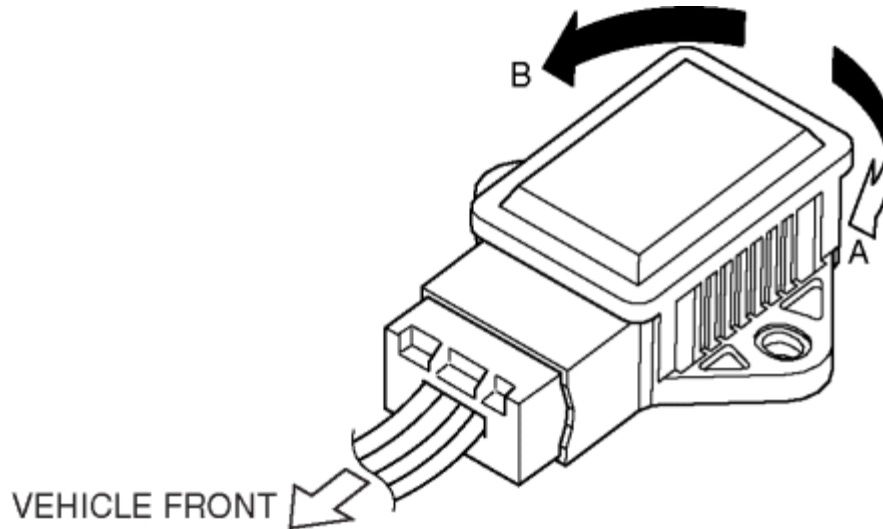
- If there is any malfunction, replace the combined sensor.

**Standard**

- When the sensor is tilted to the right (A):  
LAT\_ACCL changes negatively.
- When the sensor is tilted to the left (B):  
LAT\_ACCL changes positively.

b. Yaw rate inspection

- Verify the YAW\_RATE change when the combined sensor is rotated to the left and right.



- If there is any malfunction, replace the combined sensor.

**Standard**

- When the sensor is rotated to the right (A):  
YAW\_RATE changes negatively.
- When the sensor is rotated to the left (B):  
YAW\_RATE changes positively.

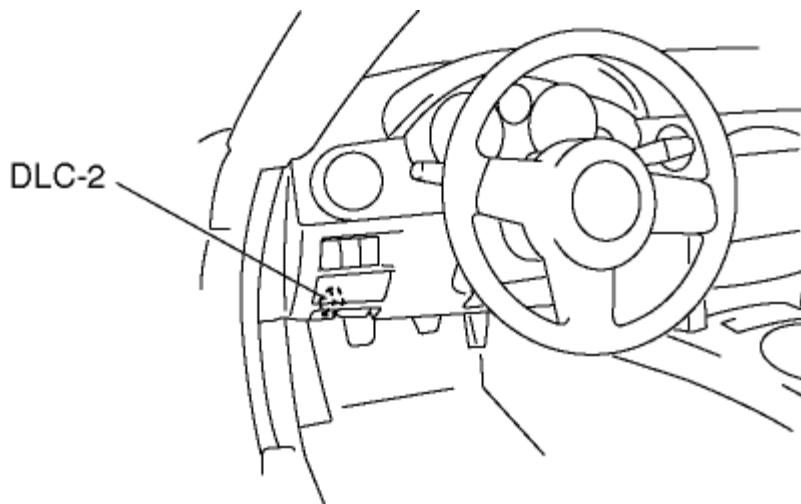
## 2008 - MX-5 - Brakes

### COMBINED SENSOR INITIALIZATION PROCEDURE

#### WARNING:

- Unless the initialization procedure of the combined sensor is completed, the DSC will not operate, causing an unexpected accident. Therefore, always perform the initialization procedure to ensure DSC operation if the combined sensor and DSC HU/CM have been removed or replaced.

1. Inspect the wheel alignment and inflation pressure.
  - If there is any malfunction, adjust the applicable part.
2. Park the vehicle on level ground.
3. Turn the ignition switch off.
4. Connect the M-MDS to the DLC-2.



5. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.
  - When using the IDS (laptop PC)
    - Select "Chassis".
    - Select "ABS/DSC".
    - Select "Sensor Initialization".
  - When using the PDS (Pocket PC)
    - Select "All Tests and Calibrations".
    - Select "Sensor Initialization".
6. Perform the initialization procedure according to the directions on the screen.

7. Drive the vehicle forward.
8. After 5 min of driving, verify that the DSC system is normal.

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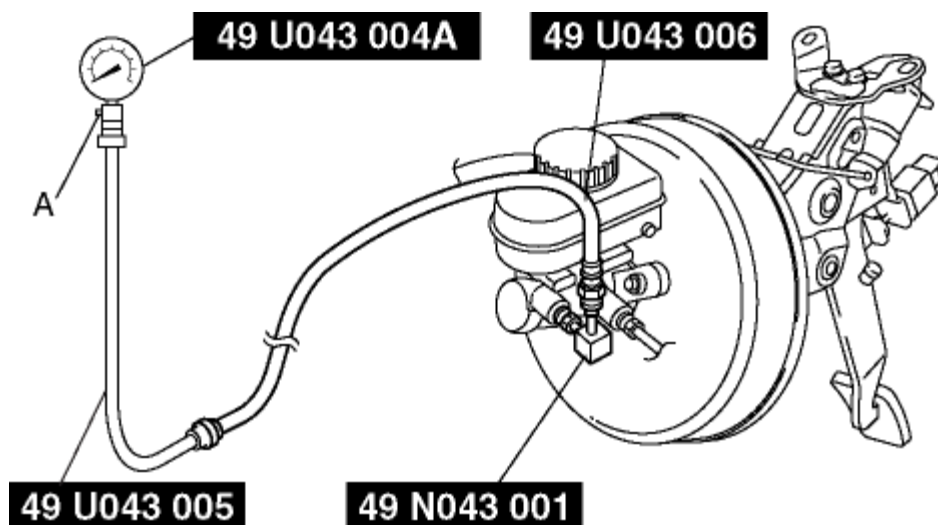
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## 2008 - MX-5 - Brakes

### BRAKE FLUID PRESSURE SENSOR INSPECTION

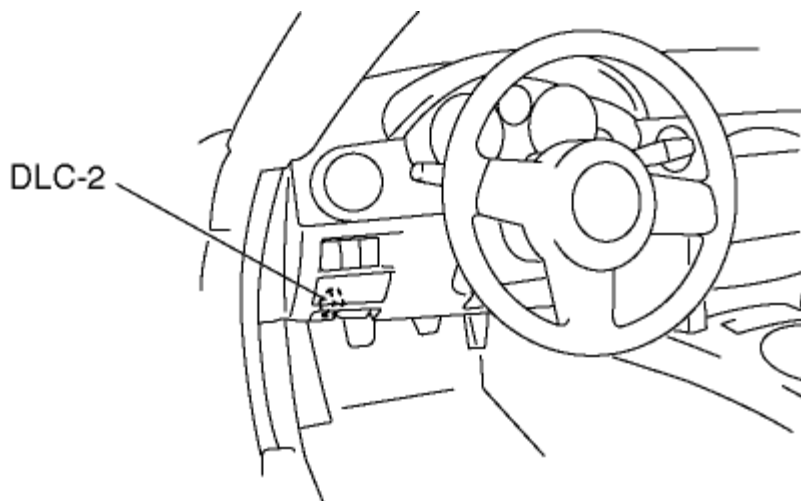
1. Turn the ignition switch off.
2. Install the **SSTs** to the master cylinder.



#### NOTE:

- Install the **SST** (49 N043 001) to the master cylinder using a commercially available flare nut wrench.
  - Flare nut across flat: **12 mm {0.47 in}**

3. Bleed the air from the **SSTs** and the brake line. (Bleed air from the **SSTs** through air bleeding valve A.)
4. Connect the M-MDS to the DLC-2.



5. Select the MCYLI P PID.

6. Start the engine.

7. Depress the brake pedal, and confirm that the fluid pressure value of the **SST** (Gauge) and the value shown on the M-MDS are equal.

- If the fluid pressures are different, replace the DSC HU/CM.

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## 2008 - MX-5 - Brakes

### STEERING ANGLE SENSOR REMOVAL/INSTALLATION

#### NOTE:

- The steering angle sensor is integrated into the combination switch to ensure sensor performance. Replace the steering angle sensor and combination switch as a single unit. (See [COMBINATION SWITCH REMOVAL/INSTALLATION](#).)

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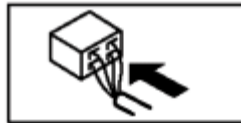
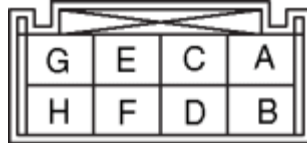
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## 2008 - MX-5 - Brakes

### STEERING ANGLE SENSOR INSPECTION

1. Remove the column cover. (See [COLUMN COVER REMOVAL/INSTALLATION](#).)
2. Measure the voltage between steering angle sensor terminal B and ground.



- If there is any malfunction, inspect the wiring harness between steering angle sensor terminal B and battery, then repair or replace if necessary.

#### Standard voltage

- B+

3. Turn the ignition switch to the ON position, then measure the voltage between steering angle sensor terminal A and ground.

- If there is any malfunction, inspect the wiring harness between steering angle sensor terminal A and ignition switch, then repair or replace if necessary.

#### Standard voltage

- B+

4. Measure the voltage between steering angle sensor terminal H and the ground.

- If there is any malfunction, inspect the wiring harness between steering angle sensor terminal H and ground point, then repair or replace if necessary.

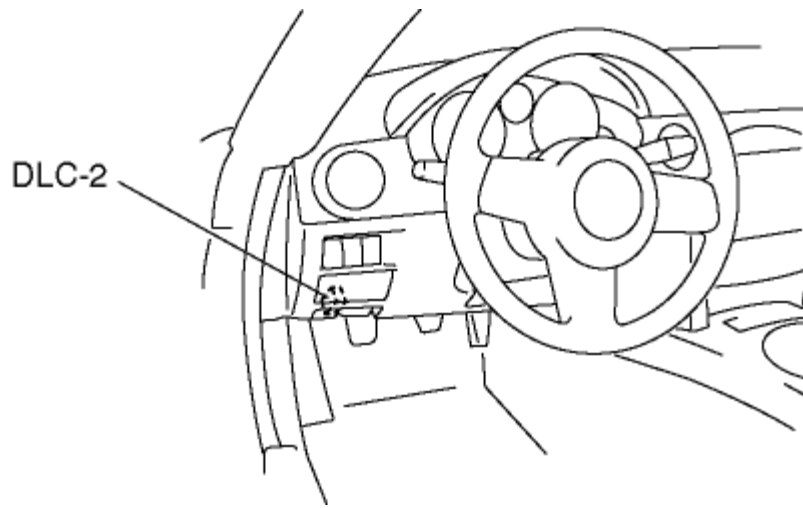
#### Standard voltage

- 0 V

5. Turn the ignition switch off.

6. Connect the M-MDS to the DLC-2.





7. Select the SWA\_POS PID.

8. Verify the SWA\_POS changes when the steering wheel is turned to the left and right.

- If there is any malfunction, replace the steering angle sensor.

**Standard**

- When the steering wheel is turned to the right:  
SWA\_POS changes positively.
- When the steering wheel is turned to the left:  
SWA\_POS changes negatively.

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## 2008 - MX-5 - Brakes

### STEERING ANGLE SENSOR INITIALIZATION PROCEDURE

#### WARNING:

- Unless the initialization procedure of the steering angle sensor is completed, the DSC will not operate, causing an unexpected accident. Therefore, always perform the initialization procedure to ensure DSC operation if the power supply to the steering angle sensor has been cut off due to disconnection of the steering angle sensor connector or negative battery cable, or any other cause.

#### NOTE:

- The initialization value of the steering angle sensor is stored using the battery power supply. Therefore, the battery power supply of the steering angle sensor is cut and the stored initialization value is cleared when any of the following items are performed.
  - Negative battery cable disconnection
  - Steering angle sensor connector disconnection
  - Fuse (ROOM 15A) removal
  - Wiring harness disconnection between battery and steering angle sensor connector

1. Inspect the wheel alignment, inflation pressure, and the installation condition of the steering wheel.

- If there is any malfunction, adjust the applicable part.

2. Connect the negative battery cable.

3. Turn the ignition switch to the ON position.

4. Confirm that the DSC indicator light illuminates and that the DSC OFF light flashes.

5. Turn the steering wheel to full right lock, then turn it to full left lock.

6. Confirm that the DSC OFF light goes out.

7. Turn the ignition switch off.

8. Turn the ignition switch to the ON position again, and confirm that the DSC indicator light goes out.

- If the DSC indicator light does not go out, disconnect the negative battery cable, and perform the procedure again starting from Step 2 shown above.

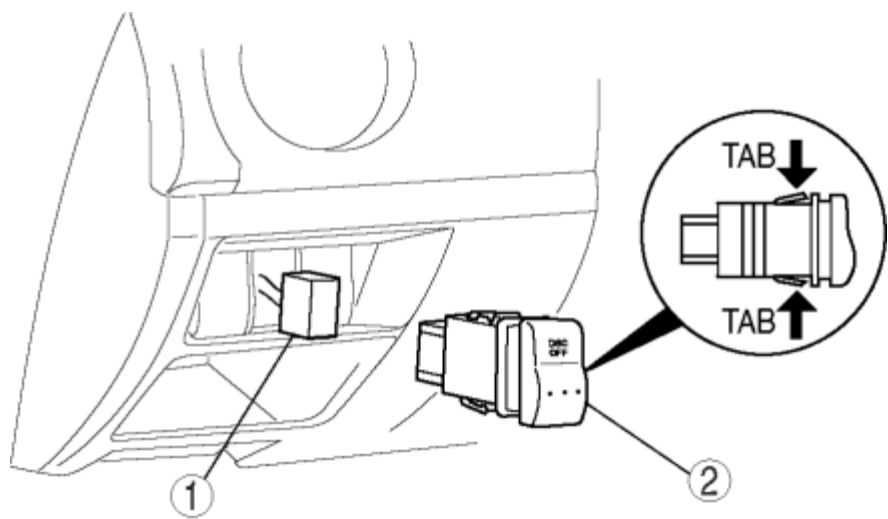
9. Drive the vehicle for **approx. 10 min**, and confirm that the ABS warning and DSC indicator lights do not illuminate.



## 2008 - MX-5 - Brakes

### DSC OFF SWITCH REMOVAL/INSTALLATION

- 1. Remove the side panel. (See [SIDE PANEL REMOVAL/INSTALLATION](#).)
- 2. Remove in the order indicated in the table.



1	DSC OFF switch connector (See <a href="#">DSC OFF Switch Connector Removal Note</a> .)
2	DSC OFF switch (See <a href="#">DSC OFF Switch Removal Note</a> .)

- 3. Install in the reverse order of removal.

### DSC OFF Switch Connector Removal Note

- 1. Access the DSC OFF switch connector from behind of the dashboard, and squeeze the tabs of the switch connector.
- 2. Disconnect the DSC OFF switch connector from the DSC OFF switch.

### DSC OFF Switch Removal Note

- 1. Access the DSC OFF switch from behind of the dashboard, and squeeze the tabs of the

switch.

2. Pull the DSC OFF switch towards the driver"s side to remove it.

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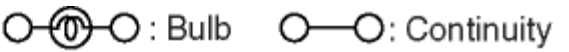
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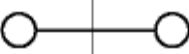


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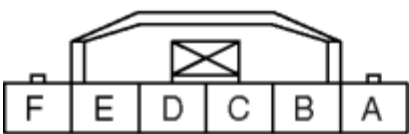
2008 - MX-5 - Brakes

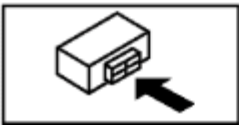
DSC OFF SWITCH INSPECTION

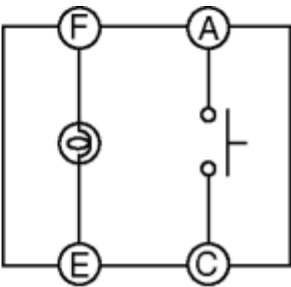
- 1. Remove the DSC OFF switch.
- 2. Verify that the continuity is as indicated in the table.
  - If not as indicated in the table, replace the DSC OFF switch.



Condition	Terminal			
	A	C	E	F
Switch pressed				
Switch released				







## 2008 - MX-5 - Brakes

### BRAKES TECHNICAL DATA

Item	Specification
Brake fluid type	SAE J1703, FMVSS 116 DOT-3
Brake pedal height (reference value)	167 mm {6.57 in}
Brake pedal play	2—5 mm {0.08—0.19 in}
Brake pedal-to-floor clearance (Brake pedal when depressed at 147 N {15.0 Kgf, 33.0 lbf})	106.9 mm {4.209 in} or more
Front disc plate runout limit	0.05 mm {0.002 in}
Minimum front disc plate thickness	20 mm {0.79 in}
Minimum front disc plate thickness after machining using a brake lathe on-vehicle	20.8 mm {0.82 in}
Minimum front disc pad thickness	2.0 mm {0.079 in} min.
Rear disc plate runout limit	0.05 mm {0.002 in}
Minimum rear disc plate thickness	8 mm {0.31 in}
Minimum rear disc plate thickness after machining using a brake lathe on-vehicle	8.8 mm {0.35 in}
Minimum rear disc pad thickness	2.0 mm {0.079 in} min.
Parking brake lever stroke when pulled at 98 N {10 kgf, 22 lbf}	1—3 notches

### Power brake unit fluid pressure

Vacuum amount at 0 kPa {0 mmHg, 0 inHg}
---

Pedal force (N {kgf, lbf})	Fluid pressure (kPa {kgf/cm <sup>2</sup> , psi})
200 {20.4, 44.9}	620 {6.33, 90.0} or more

**Power brake unit fluid pressure**

Vacuum amount at o 66.7 kPa {500 mmHg, 19.7 inHg}	
Pedal force (N {kgf, lbf})	Fluid pressure (kPa {kgf/cm <sup>2</sup> , psi})
200 {20.4, 44.9}	6,340 {64.65, 919.6} or more

**Dual proportioning valve fluid pressure**

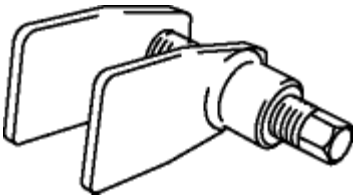
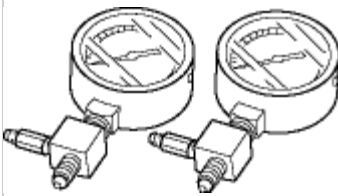
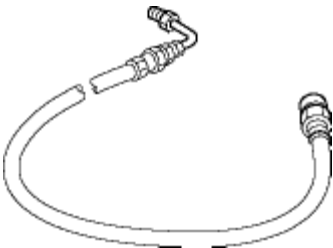
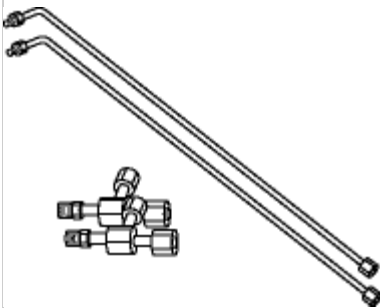
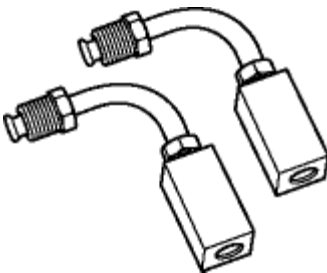
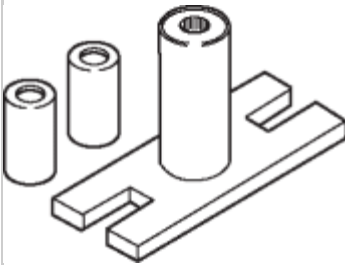
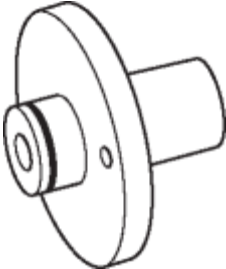
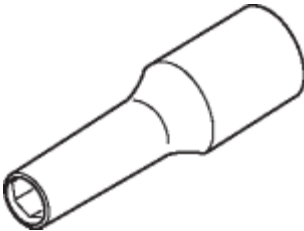
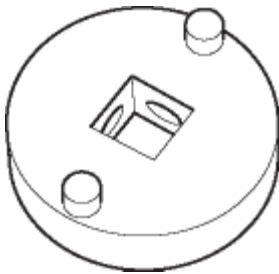
MASTER CYLINDER PRESSURE (kPa {kgf/cm <sup>2</sup> , psi})	REAR BRAKE PRESSURE (kPa {kgf/cm <sup>2</sup> , psi})
3,430 {34.98, 497.5}	3,130 {31.92, 453.9} — 3,730 {38.04, 540.9}
5,880 {59.96, 852.8}	4,010 {40.90, 581.7} — 4,810 {49.05, 697.6}



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2008 - MX-5 - Brakes

BRAKES SST

<div>49 0221 600C</div> <div>Disc brake piston wrench</div>		<div>49 U043 004A</div> <div>Oil pressure gauge  (Part of 49 U043 0A0A)</div>		<div>49 U043 006</div> <div>Hose  (Part of 49 U043 0A0A)</div>	
<div>49 U043 005</div> <div>Joint  (Part of 49 U043 0A0A)</div>		<div>49 N043 001</div> <div>Adapter</div>		<div>49 E043 003A</div> <div>Turning lock tool</div>	
<div>49 G043 001</div> <div>Gauge</div>		<div>49 B043 004</div> <div>Socket wrench</div>		<div>49 F043 002</div> <div>Wrench</div>	

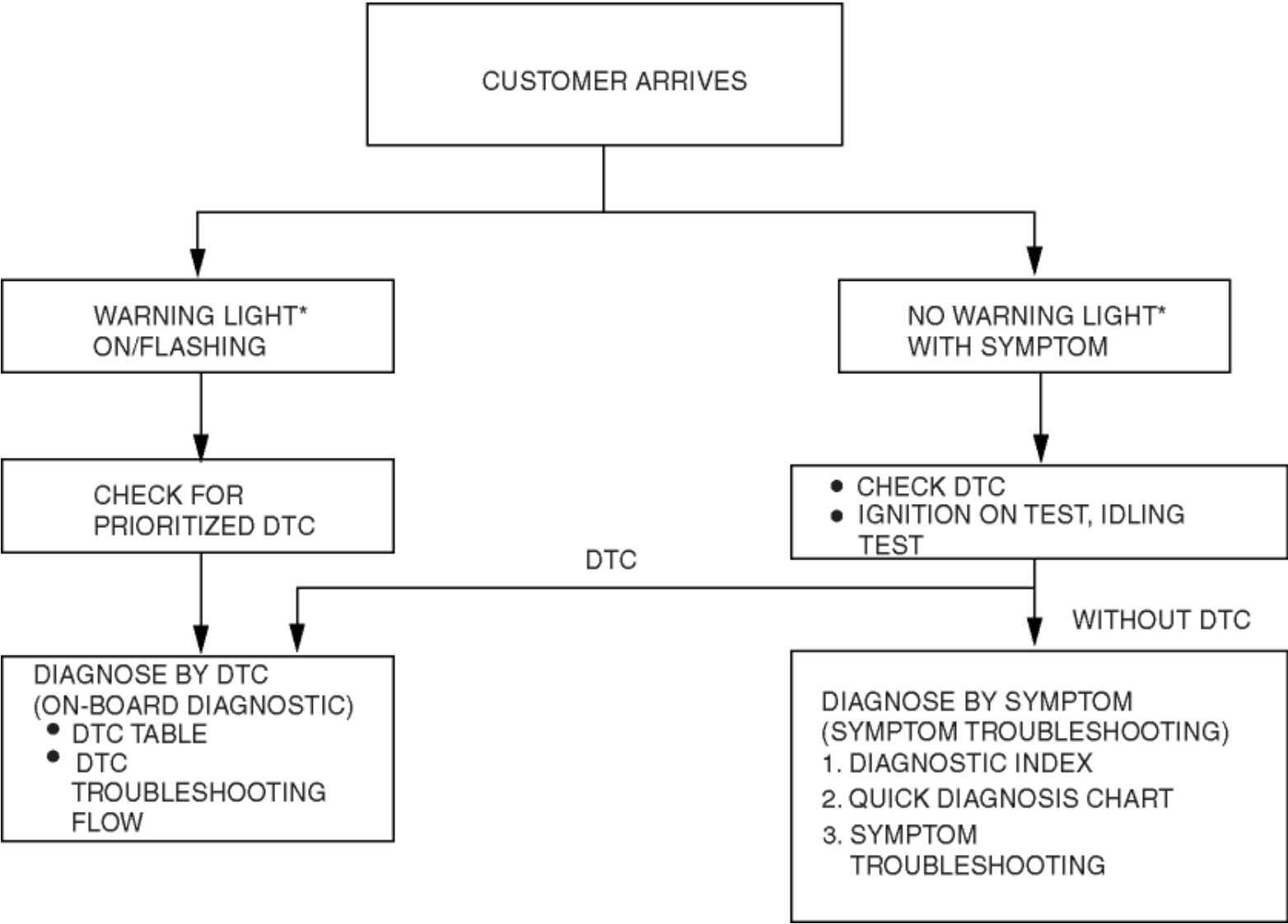
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2008 - MX-5 - Transmission/Transaxle

FOREWORD [SJ6A-EL]

- When the customer reports vehicle malfunction, check the malfunction indicator lamp (MIL) indication, AT warning indication, and diagnostic trouble code (DTC), then diagnose the malfunction according to following flowchart.
  - If a DTC exists, diagnose the applicable DTC inspection. (See **DTC TABLE [SJ6A-EL]**.)
  - If a DTC does not exist and the MIL and AT warning lights do not illuminate, diagnose the applicable symptom troubleshooting. (See **SYMPTOM TROUBLESHOOTING ITEM TABLE [SJ6A-EL]**.)



\*: Malfunction Indicator Lamp (MIL), AT warning light



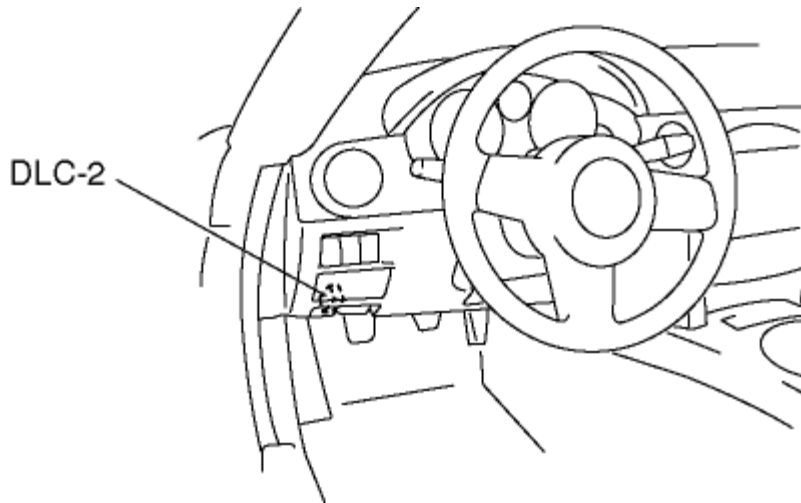
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### AFTER REPAIR PROCEDURE [SJ6A-EL]

#### CAUTION:

- After repairing a malfunction, perform this procedure to verify that the malfunction has been corrected.
- When this procedure is carried out, be sure to drive the vehicle at lawful speed and pay attention to the other vehicles.

1. Connect the M-MDS to the vehicle DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  - Select "Self Test".
  - Select "Modules".
  - Select "TCM".
- When using the PDS (Pocket PC)
  - Select "Module Tests".
  - Select "PCM".
  - Select "Self Test".

3. Verify the DTC according to the directions on the M-MDS screen.

4. Press the clear button on the DTC screen to clear the DTC.

5. Perform the following trouble code inspections to ensure that the DTC has been resolved:

DTC No.	inspection
P0601, P0603, P0604, P0712, P0713, P0717, P0722, P0882, P0883, P0961, P0962, P0963, P0969, P0970, P0971, P0973, P0974, P0976, P0977, P0979, P0980, P0982, P0983, P0985, P0986, P2719, P2720, P2721, P2762, P2763, P2764	<ul style="list-style-type: none"> <li>• Start the engine.</li> <li>• Warm up the engine and AT.</li> <li>• Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 6GR.</li> <li>• Gradually slow down and stop the vehicle.</li> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Go to Step 6.</li> </ul>
P0707	<ul style="list-style-type: none"> <li>• Start the engine.</li> <li>• Warm up the engine to normal operating temperature.</li> <li>• Depress the brake pedal, and shift the selector lever from P to D for <b>2 s or more</b>.</li> <li>• Gradually slow down and stop the vehicle.</li> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Go to Step 6.</li> </ul>
	<ul style="list-style-type: none"> <li>• Start the engine.</li> <li>• Warm up the engine to normal operating temperature.</li> <li>• Depress the brake pedal, and shift the selector lever from P to D for <b>2 s or more</b>.</li> <li>• Gradually slow down and stop the vehicle.</li> </ul>

P0708

- Turn the ignition switch to the LOCK position.
- Start the engine.
- Depress the brake pedal, and shift the selector lever from P to D for **2 s or more**.
- Gradually slow down and stop the vehicle.
- Turn the ignition switch to the LOCK position.
- Go to Step 6.

P0711

- Start the engine.
- Warm up the engine to normal operating temperature.
- Drive the vehicle in D range for **10 min or more**.
- Gradually slow down and stop the vehicle.
- Turn the ignition switch to the LOCK position.
- Go to Step 6.

P0751, P0752, P0756, P0757, P0761, P0762, P0766, P0781, P0813

- Start the engine.
- Warm up the engine and AT.
- Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 6GR.
- Gradually slow down and stop the vehicle.
- Turn the ignition switch to the LOCK position.
- Start the engine.

	<ul style="list-style-type: none"> <li>• Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 6GR.</li> <li>• Gradually slow down and stop the vehicle.</li> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Go to Step 6.</li> </ul>
P0819	<ul style="list-style-type: none"> <li>• Start the engine.</li> <li>• Warm up the engine to normal operating temperature.</li> <li>• Drive the vehicle in M range, and shift the selector lever (operate up and down switches) between 1GR to 6GR for <b>10 s or more</b>.</li> <li>• Gradually slow down and stop the vehicle.</li> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Go to Step 6.</li> </ul>
P0826	<ul style="list-style-type: none"> <li>• Start the engine.</li> <li>• Warm up the engine to normal operating temperature.</li> <li>• Drive the vehicle in M range, and shift the steering shift switch (operate up and down switches) between 1GR to 6GR for <b>10 s or more</b>.</li> <li>• Gradually slow down and stop the vehicle.</li> <li>• Turn the ignition switch to the LOCK position.</li> </ul>

	<ul style="list-style-type: none"> <li>• Go to Step 6.</li> </ul>
P2757, P2758	<ul style="list-style-type: none"> <li>• Start the engine.</li> <li>• Warm up the engine to normal operating temperature.</li> <li>• Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 6GR and TCC is operated.</li> <li>• Gradually slow down and stop the vehicle.</li> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Go to Step 6.</li> </ul>

6. Gradually slow down and stop the vehicle.

7. Make sure that no DTCs occur.

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### DTC TABLE [SJ6A-EL]

X: Available—: N/A

DTC No.	Condition	MIL	AT warning light	DC	Memory function	Page
P0601	Flash ROM malfunction	X	X	1	X	(See <a href="#">DTC P0601 [SJ6A-EL]</a> )
P0603	EEPROM malfunction	X	X	1	X	(See <a href="#">DTC P0603 [SJ6A-EL]</a> )
P0604	RAM malfunction	X	X	1	X	(See <a href="#">DTC P0604 [SJ6A-EL]</a> )
P0707	Transmission range (TR) switch circuit low input (short to ground)	X	X	1	X	(See <a href="#">DTC P0707 [SJ6A-EL]</a> )
P0708	Transmission range (TR) switch circuit high input (open circuit)	X	X	2	X	(See <a href="#">DTC P0708 [SJ6A-EL]</a> )
P0711	Transmission fluid temperature (TFT) sensor malfunction (stuck)	X	X	2	X	(See <a href="#">DTC P0711 [SJ6A-EL]</a> )
P0712	Transmission fluid temperature (TFT) sensor circuit malfunction (short to ground)	X	X	1	X	(See <a href="#">DTC P0712 [SJ6A-EL]</a> )
P0713	Transmission fluid temperature (TFT) sensor circuit malfunction (short to power/open circuit)	X	X	1	X	(See <a href="#">DTC P0713 [SJ6A-EL]</a> )
P0717	Turbine sensor circuit malfunction (open circuit/short circuit)	X	X	1	X	(See <a href="#">DTC P0717 [SJ6A-EL]</a> )
P0722	Vehicle speed sensor (VSS) circuit malfunction (open circuit/short circuit)	X	X	1	X	(See <a href="#">DTC P0722 [SJ6A-EL]</a> )
P0751	Shift solenoid A malfunction (stuck off)	X	X	2	X	(See <a href="#">DTC P0751 [SJ6A-EL]</a> )

P0752	Shift solenoid A malfunction (stuck on)	X	X	2	X	(See <a href="#">DTC P0752 [SJ6A-EL]</a> )
P0756	Shift solenoid B malfunction (stuck off)	X	X	2	X	(See <a href="#">DTC P0756 [SJ6A-EL]</a> )
P0757	Shift solenoid B malfunction (stuck on)	X	X	2	X	(See <a href="#">DTC P0757 [SJ6A-EL]</a> )
P0761	Shift solenoid C malfunction (stuck off)	X	X	2	X	(See <a href="#">DTC P0761 [SJ6A-EL]</a> )
P0762	Shift solenoid C malfunction (stuck on)	X	X	2	X	(See <a href="#">DTC P0762 [SJ6A-EL]</a> )
P0766	Shift solenoid D malfunction (stuck off)	X	X	2	X	(See <a href="#">DTC P0766 [SJ6A-EL]</a> )
	Shift solenoid G malfunction (stuck on)	X	X	2	X	(See <a href="#">DTC P0766 [SJ6A-EL]</a> )
P0781	1-2 shift valve malfunction	X	X	2	X	(See <a href="#">DTC P0781 [SJ6A-EL]</a> )
P0813	Reverse sequence valve malfunction	X	X	2	X	(See <a href="#">DTC P0813 [SJ6A-EL]</a> )
P0819	Manual switch/up switch/down switch circuit malfunction (open circuit/short circuit)	–	X	1	X	(See <a href="#">DTC P0819 [SJ6A-EL]</a> )
P0826	Steering shift switch circuit malfunction (open circuit/short to ground)	X	X	1	X	(See <a href="#">DTC P0826 [SJ6A-EL]</a> )
P0882	TCM B+ low (less than 9 V)	–	X	1	X	(See <a href="#">DTC P0882 [SJ6A-EL]</a> )
P0883	TCM B+ low (less than 11 V)	–	X	1	X	(See <a href="#">DTC P0883 [SJ6A-EL]</a> )
P0961	Line pressure control solenoid range/performance (stuck)	X	X	1	X	(See <a href="#">DTC P0961 [SJ6A-EL]</a> )
P0962	Line pressure control solenoid circuit malfunction (short to ground/open circuit)	X	X	1	X	(See <a href="#">DTC P0962 [SJ6A-EL]</a> )
P0963	Line pressure control solenoid circuit malfunction (short to power)	X	X	1	X	(See <a href="#">DTC P0963 [SJ6A-EL]</a> )

P0969	Shift solenoid F range/performance (stuck)	X	X	1	X	(See <a href="#">DTC P0969 [SJ6A-EL]</a> )
P0970	Shift solenoid F circuit malfunction (short to ground/open circuit)	X	X	1	X	(See <a href="#">DTC P0970 [SJ6A-EL]</a> )
P0971	Shift solenoid F circuit malfunction (short to power)	X	X	1	X	(See <a href="#">DTC P0971 [SJ6A-EL]</a> )
P0973	Shift solenoid A circuit malfunction (short to ground)	X	X	1	X	(See <a href="#">DTC P0973 [SJ6A-EL]</a> )
P0974	Shift solenoid A circuit malfunction (short to power/open circuit)	X	X	1	X	(See <a href="#">DTC P0974 [SJ6A-EL]</a> )
P0976	Shift solenoid B circuit malfunction (short to ground)	X	X	1	X	(See <a href="#">DTC P0976 [SJ6A-EL]</a> )
P0977	Shift solenoid B circuit malfunction (short to power/open circuit)	X	X	1	X	(See <a href="#">DTC P0977 [SJ6A-EL]</a> )
P0979	Shift solenoid C circuit malfunction (short to ground)	X	X	1	X	(See <a href="#">DTC P0979 [SJ6A-EL]</a> )
P0980	Shift solenoid C circuit malfunction (short to power/open circuit)	X	X	1	X	(See <a href="#">DTC P0980 [SJ6A-EL]</a> )
P0982	Shift solenoid D circuit malfunction (short to ground)	X	X	1	X	(See <a href="#">DTC P0982 [SJ6A-EL]</a> )
P0983	Shift solenoid D circuit malfunction (short to power/open circuit)	X	X	1	X	(See <a href="#">DTC P0983 [SJ6A-EL]</a> )
P0985	Shift solenoid E circuit malfunction (short to ground)	X	X	1	X	(See <a href="#">DTC P0985 [SJ6A-EL]</a> )
P0986	Shift solenoid E circuit malfunction (short to power/open circuit)	X	X	1	X	(See <a href="#">DTC P0986 [SJ6A-EL]</a> )
P2719	Shift solenoid G range/performance (stuck)	X	X	1	X	(See <a href="#">DTC P2719 [SJ6A-EL]</a> )
P2720	Shift solenoid G circuit malfunction (short to ground/open circuit)	X	X	1	X	(See <a href="#">DTC P2720 [SJ6A-EL]</a> )
P2721	Shift solenoid G circuit malfunction (short to power)	X	X	1	X	(See <a href="#">DTC P2721 [SJ6A-EL]</a> )

P2757	Torque converter clutch (TCC) stuck off	X	X	2	X	(See <a href="#">DTC P2757 [SJ6A-EL]</a> )
P2758	Torque converter clutch (TCC) stuck on	X	X	2	X	(See <a href="#">DTC P2758 [SJ6A-EL]</a> )
P2762	TCC control solenoid range/performance (stuck)	X	X	1	X	(See <a href="#">DTC P2762 [SJ6A-EL]</a> )
P2763	TCC control solenoid circuit malfunction (short to power)	X	X	1	X	(See <a href="#">DTC P2763 [SJ6A-EL]</a> )
P2764	TCC control solenoid circuit malfunction (short to ground/open circuit)	X	X	1	X	(See <a href="#">DTC P2764 [SJ6A-EL]</a> )
U0073	CAN BUS OFF	(See <a href="#">DTC TABLE [MULTIPLEX COMMUNICATION SYSTEM]</a> )				
U0100	TCM cannot receive any signals from PCM	(See <a href="#">DTC TABLE [MULTIPLEX COMMUNICATION SYSTEM]</a> )				

MIL  
DC  
—  
N/A

**Malfunction Indicator Lamp**  
**Drive Cycle**  
**N/A**

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### DTC P0601 [SJ6A-EL]

DTC P0601	Flash ROM malfunction
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>Flash ROM (in TCM) internal circuit malfunction is detected.</li> </ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"> <li>The MIL illuminates if the TCM detects the above malfunction condition during the first drive cycle.</li> <li>A PENDING CODE is not available.</li> <li>FREEZE FRAME DATA is available.</li> <li>The AT warning light illuminates.</li> <li>The DTC is stored in the TCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>TCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Replace the TCM, then go to the next step.  (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL]</a> .)

3	<b>VERIFY TROUBLESHOOTING OF DTC P0601 COMPLETED</b> <ul style="list-style-type: none"><li>• Make sure to reconnect all the disconnected connectors.</li><li>• Clear the DTC from the memory using the M-MDS.</li><li>• Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li><li>• Is same DTC present?</li></ul>	Yes	Replace the TCM, then go to the next step.  (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL]</a> .)
		No	Go to the next step.
4	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "After Repair Procedure".  (See <a href="#">AFTER REPAIR PROCEDURE [SJ6A-EL]</a>.)</li><li>• Are any DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection.  (See <a href="#">DTC TABLE [SJ6A-EL]</a> .)
		No	Troubleshooting completed.

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### DTC P0603 [SJ6A-EL]

DTC P0603	EEPROM malfunction
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>Different numeric values for EEPROM and RAM (in TCM) are detected.</li> </ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"> <li>The MIL illuminates if the TCM detects the above malfunction condition during the first drive cycle.</li> <li>A PENDING CODE is not available.</li> <li>FREEZE FRAME DATA is available.</li> <li>The AT warning light illuminates.</li> <li>The DTC is stored in the TCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>TCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Replace the TCM, then go to the next step.  (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL]</a> .)

3	<b>VERIFY TROUBLESHOOTING OF DTC P0603 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all the disconnected connectors.</li> <li>• Clear the DTC from the memory using the M-MDS.</li> <li>• Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li> <li>• Is same DTC present?</li> </ul>	Yes	Replace the TCM, then go to the next step.  (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL]</a> .)
		No	Go to the next step.
4	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform the "After Repair Procedure".  (See <a href="#">AFTER REPAIR PROCEDURE [SJ6A-EL]</a>.)</li> <li>• Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection.  (See <a href="#">DTC TABLE [SJ6A-EL]</a> .)
		No	Troubleshooting completed.

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### DTC P0604 [SJ6A-EL]

DTC P0604	RAM malfunction
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>RAM (in TCM) read/write error is detected.</li> </ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"> <li>The MIL illuminates if the TCM detects the above malfunction condition during the first drive cycle.</li> <li>A PENDING CODE is not available.</li> <li>FREEZE FRAME DATA is available.</li> <li>The AT warning light illuminates.</li> <li>The DTC is stored in the TCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>TCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Replace the TCM, then go to the next step.  (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL]</a> .)

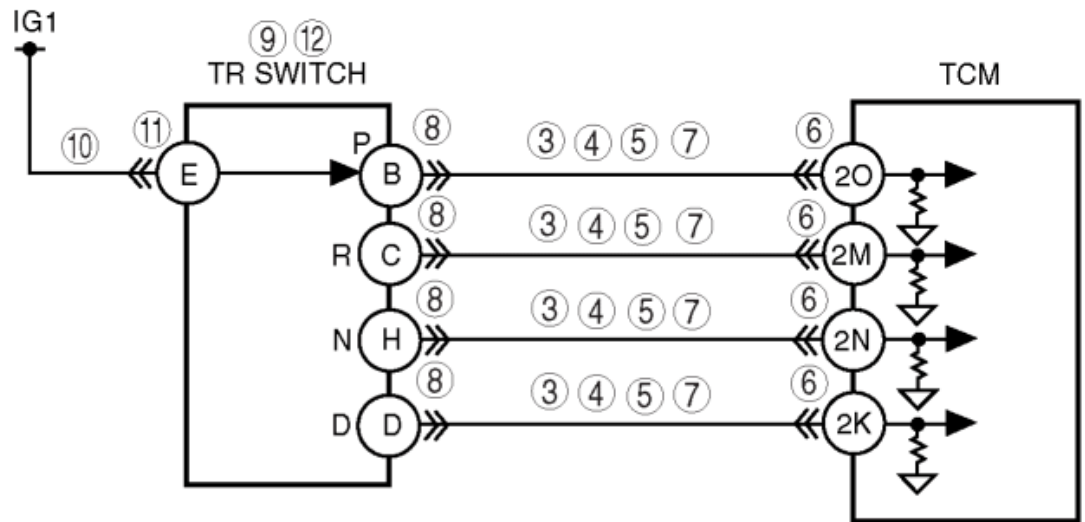
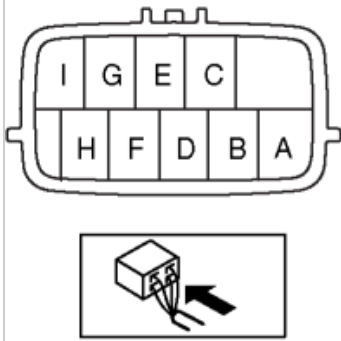
3	<b>VERIFY TROUBLESHOOTING OF DTC P0604 COMPLETED</b> <ul style="list-style-type: none"><li>• Make sure to reconnect all the disconnected connectors.</li><li>• Clear the DTC from the memory using the M-MDS.</li><li>• Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li><li>• Is same DTC present?</li></ul>	Yes	Replace the TCM, then go to the next step.  (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL]</a> .)
		No	Go to the next step.
4	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "After Repair Procedure".  (See <a href="#">AFTER REPAIR PROCEDURE [SJ6A-EL]</a>.)</li><li>• Are any DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection.  (See <a href="#">DTC TABLE [SJ6A-EL]</a> .)
		No	Troubleshooting completed.

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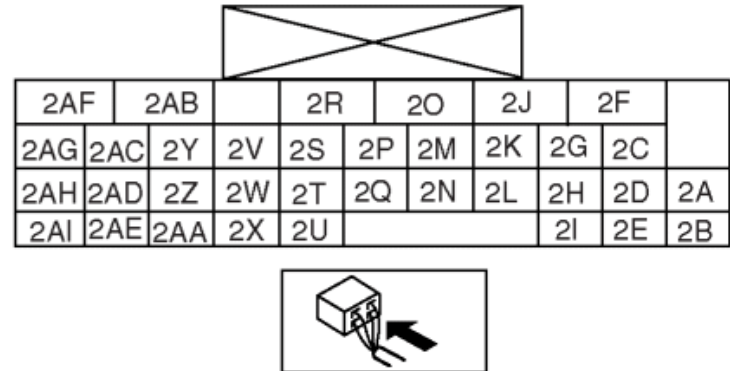
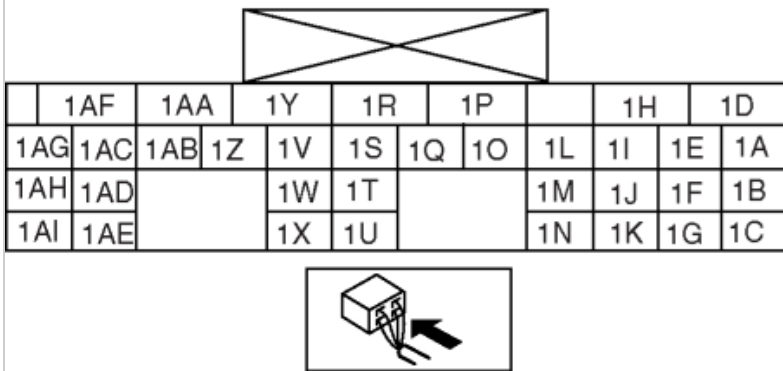
DTC P0707 [SJ6A-EL]

DTC P0707	Transmission range (TR) switch circuit low input (short to ground)
DETECTION CONDITION	<ul style="list-style-type: none"><li>TR switch position voltage input to TCM is <b>less than 0.127 V</b> when ignition switch is at ON position.</li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>The AT warning light illuminates if the TCM detects the above malfunction condition during the first drive cycle.</li><li>A PENDING CODE is not available.</li><li>FREEZE FRAME DATA is available.</li><li>MIL does not illuminate.</li><li>The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>TR switch malfunction</li><li>TR switch misadjustment</li><li>Short to ground in wiring harness between TR switch terminal B and TCM terminal 2O</li><li>Short to ground in wiring harness between TR switch terminal C and TCM terminal 2M</li><li>Short to ground in wiring harness between TR switch terminal H and TCM terminal 2N</li><li>Short to ground in wiring harness between TR switch terminal D and TCM terminal 2K</li><li>Open circuit in wiring harness between TR switch terminal B and TCM terminal 2O</li><li>Open circuit in wiring harness between TR switch terminal C and TCM terminal 2M</li><li>Open circuit in wiring harness between TR switch terminal H and TCM terminal 2N</li><li>Open circuit in wiring harness between TR switch terminal D and TCM terminal 2K</li><li>Open circuit in wiring harness between TR switch terminal E and ignition switch (IG1)</li><li>Short to ground in wiring harness between TR switch terminal E and ignition switch (IG1)</li><li>Damaged connector between TR switch and TCM</li><li>TCM malfunction</li></ul>

# TR SWITCH WIRING HARNESS-SIDE CONNECTOR



## TCM WIRING HARNESS-SIDE CONNECTOR



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Record the FREEZE FRAME DATA on the repair order, then go to the next step.</p>
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	<p>Yes Perform repair or diagnosis according to the available repair information.</p> <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> <p>No Replace the TCM, then go to the next step.</p> <p>(See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL]</a>.)</p>
3	<b>INSPECT TR SWITCH CIRCUIT</b> <ul style="list-style-type: none"> <li>Connect the TCM connector.</li> <li>Turn the ignition switch to the ON position. (engine off)</li> </ul>	<p>Yes Go to Step 13.</p> <p>No Go to the next step.</p>

	<ul style="list-style-type: none"> <li>Inspect the voltage between TCM terminal (wiring harness-side) and body ground. <ul style="list-style-type: none"> <li>TCM terminal 2O <ul style="list-style-type: none"> <li>P position: B+</li> <li>Other positions and all ranges: 0V</li> </ul> </li> <li>TCM terminal 2M <ul style="list-style-type: none"> <li>R position: B+</li> <li>Other position and all ranges: 0V</li> </ul> </li> <li>TCM terminal 2N <ul style="list-style-type: none"> <li>N position: B+</li> <li>Other position and all range: 0V</li> </ul> </li> <li>TCM terminal 2K <ul style="list-style-type: none"> <li>D range: B+</li> <li>Other ranges and all positions: 0V</li> </ul> </li> </ul> </li> <li>Are any of following terminal voltage turned on for even a moment while shifting selector lever slowly from P position to D range?</li> </ul>		
4	<b>INSPECT TR SWITCH CIRCUIT</b> <ul style="list-style-type: none"> <li>Are all terminal voltage <b>0 V</b> in Step 3?</li> </ul>	Yes	Go to Step 10.
		No	Go to the next step.
5	<b>INSPECT TR SWITCH CIRCUIT</b> <ul style="list-style-type: none"> <li>Are there two or more terminals where the voltage is abnormal in Step 3?</li> </ul>	Yes	Adjust the TR switch, then go to Step 13.  (See <b>TRANSMISSION RANGE (TR) SWITCH ADJUSTMENT [SJ6A-EL]</b> .)
		No	Go to the next step.
6	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the TCM connector.</li> <li>Inspect for poor connection at TCM terminals 2O, 2K, 2M and 2N (such as damaged/pulled-out pins, corrosion).</li> <li>Is there any malfunction?</li> </ul>	Yes	Repair or replace the connector and/or terminal, then go to Step 13.
		No	Go to the next step.
7	<b>INSPECT TR SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>Inspect for continuity between TR switch terminals (wiring harness-side) and body ground. <ul style="list-style-type: none"> <li>P position: B and body ground</li> <li>R position: C and body ground</li> </ul> </li> </ul>	Yes	Repair or replace the wiring harness for short to ground, go to Step 12.
		No	Go to the next step.

	<p>N position: H and body ground</p> <ul style="list-style-type: none"> <li>▪ D range: D and body ground</li> <li>• Is there continuity?</li> </ul>		
8	<p><b>INSPECT TR SWITCH CONNECTOR FOR POOR CONNECTION</b></p> <ul style="list-style-type: none"> <li>• Disconnect the TR switch connector.</li> <li>• Inspect for poor connection at TR switch terminals B, C, D and H (part-side) (such as damaged/pulled-out pins, corrosion)</li> <li>• Are TR switch terminals normal?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Repair terminals or replace the TR switch, then go to Step 13.</p> <p>(See <a href="#">TRANSMISSION RANGE (TR) SWITCH REMOVAL/INSTALLATION [SJ6A-EL].</a>)</p>	
9	<p><b>INSPECT TR SWITCH</b></p> <ul style="list-style-type: none"> <li>• Inspect the TR switch.</li> </ul> <p>(See <a href="#">TRANSMISSION RANGE (TR) SWITCH INSPECTION [SJ6A-EL].</a>)</p> <ul style="list-style-type: none"> <li>• Is the TR switch normal?</li> </ul>	<p>Yes Repair or replace the wiring harness for open circuit, then go to Step 13.</p> <p>No Replace the TR switch, then go to Step 13.</p> <p>(See <a href="#">TRANSMISSION RANGE (TR) SWITCH REMOVAL/INSTALLATION [SJ6A-EL].</a>)</p>	
10	<p><b>INSPECT TR SWITCH POWER CIRCUIT FOR OPEN CIRCUIT</b></p> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Disconnect the TR switch connector.</li> <li>• Turn the ignition switch to the ON position (engine off).</li> <li>• Inspect the voltage at TR switch (wiring harness-side) terminal E.</li> <li>• Is there <b>B+</b> at TR switch (wiring harness-side) terminal E?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Inspect the METER 15A fuse.</p> <ul style="list-style-type: none"> <li>• If normal, repair or replace the wiring harness, then go to Step 13.</li> </ul>	
11	<p><b>INSPECT TR SWITCH CONNECTOR FOR POOR CONNECTION</b></p> <ul style="list-style-type: none"> <li>• Disconnect the TR switch connector.</li> <li>• Inspect for poor connection at TR switch terminal E (part-side) (such as damaged/pulled-out pins, corrosion)</li> <li>• Are TR switch terminals normal?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Repair terminals or replace the TR switch, then go to Step 13.</p> <p>(See <a href="#">TRANSMISSION RANGE (TR) SWITCH REMOVAL/INSTALLATION [SJ6A-EL].</a>)</p>	
12	<p><b>INSPECT TR SWITCH</b></p> <ul style="list-style-type: none"> <li>• Inspect the TR switch.</li> </ul> <p>(See <a href="#">TRANSMISSION RANGE (TR) SWITCH INSPECTION [SJ6A-EL].</a>)</p> <ul style="list-style-type: none"> <li>• Is the TR switch normal?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Replace the TR switch, then go to the next step.</p> <p>(See <a href="#">TRANSMISSION RANGE (TR) SWITCH REMOVAL/INSTALLATION [SJ6A-EL].</a>)</p>	
13	<p><b>VERIFY TROUBLESHOOTING OF DTC P0707 COMPLETED</b></p> <ul style="list-style-type: none"> <li>• Make sure to reconnect all the disconnected connectors.</li> <li>• Clear the DTC from the memory using the M-MDS.</li> <li>• Drive the vehicle in each range (P—D).</li> <li>• Is same DTC present?</li> </ul>	<p>Yes Replace the TCM, then go to the next step.</p> <p>(See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL].</a>)</p> <p>No Go to the next step.</p>	
	<b>VERIFY AFTER REPAIR PROCEDURE</b>		

14	<ul style="list-style-type: none"><li>Perform the "After Repair Procedure". (See <b>AFTER REPAIR PROCEDURE [SJ6A-EL]</b>.)</li><li>Are any DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [SJ6A-EL]</b> .)
		No	Troubleshooting completed.

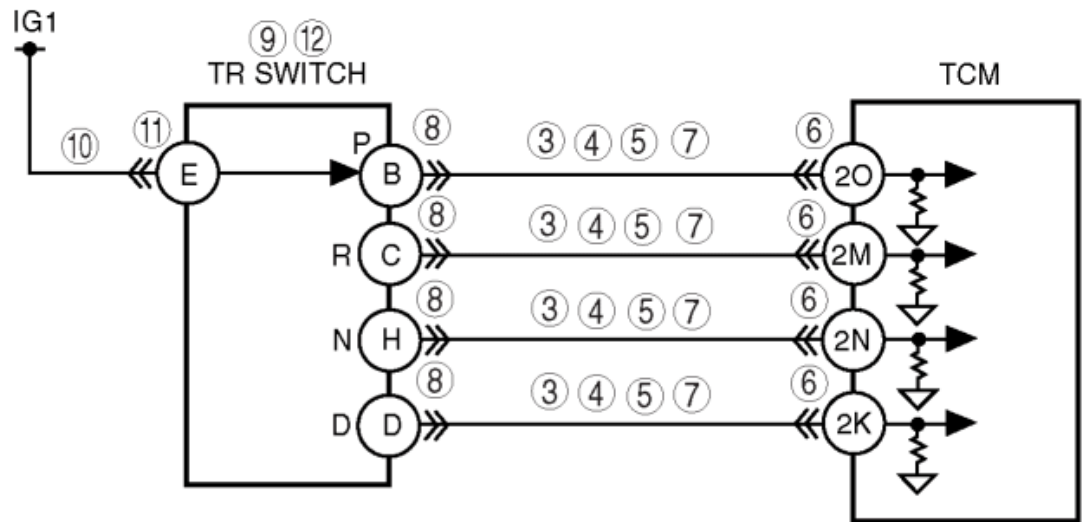
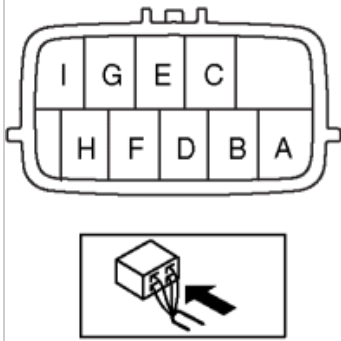
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DTC P0708 [SJ6A-EL]

DTC P0708	Transmission range (TR) switch circuit high input (open circuit)
DETECTION CONDITION	<ul style="list-style-type: none"><li>Vehicle speed is <b>30 km/h { 18.6 mph } or more</b>, and no range signal is input from the TR switch.</li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>The MIL illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles.</li><li>PENDING CODE is available.</li><li>FREEZE FRAME DATA is available.</li><li>The AT warning light illuminates.</li><li>The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>TR switch malfunction</li><li>TR switch misadjustment</li><li>Short to ground in wiring harness between TR switch terminal B and TCM terminal 2O</li><li>Short to ground in wiring harness between TR switch terminal C and TCM terminal 2M</li><li>Short to ground in wiring harness between TR switch terminal H and TCM terminal 2N</li><li>Short to ground in wiring harness between TR switch terminal D and TCM terminal 2K</li><li>Open circuit in wiring harness between TR switch terminal B and TCM terminal 2O</li><li>Open circuit in wiring harness between TR switch terminal C and TCM terminal 2M</li><li>Open circuit in wiring harness between TR switch terminal H and TCM terminal 2N</li><li>Open circuit in wiring harness between TR switch terminal D and TCM terminal 2K</li><li>Open circuit in wiring harness between TR switch terminal E and ignition switch (IG1)</li><li>Short to ground in wiring harness between TR switch terminal E and ignition switch (IG1)</li><li>Damaged connector between TR switch and TCM</li><li>TCM malfunction</li></ul>



# TR SWITCH WIRING HARNESS-SIDE CONNECTOR



## TCM WIRING HARNESS-SIDE CONNECTOR

1AF	1AA	1Y	1R	1P				1H	1D		
1AG	1AC	1AB	1Z	1V	1S	1Q	1O	1L	1I	1E	1A
1AH	1AD			1W	1T			1M	1J	1F	1B
1AI	1AE			1X	1U			1N	1K	1G	1C

2AF	2AB			2R	2O	2J	2F				
2AG	2AC	2Y	2V	2S	2P	2M	2K	2G	2C		
2AH	2AD	2Z	2W	2T	2Q	2N	2L	2H	2D	2A	
2AI	2AE	2AA	2X	2U				2I	2E	2B	

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Record the FREEZE FRAME DATA on the repair order, then go to the next step.</p>
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	<p>Yes Perform repair or diagnosis according to the available repair information.</p> <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> <p>No Replace the TCM, then go to the next step.</p> <p>(See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL]</a>.)</p>
3	<b>INSPECT TR SWITCH CIRCUIT</b> <ul style="list-style-type: none"> <li>Connect the TCM connector.</li> <li>Turn the ignition switch to the ON position. (engine off)</li> </ul>	<p>Yes Go to Step 13.</p> <p>No Go to the next step.</p>

	<ul style="list-style-type: none"><li>• Inspect the voltage between TCM terminal (wiring harness-side) and body ground.<ul style="list-style-type: none"><li>▪ TCM terminal 2O<ul style="list-style-type: none"><li>• P position: B+</li><li>• Other positions and all ranges: 0V</li></ul></li><li>▪ TCM terminal 2M<ul style="list-style-type: none"><li>• R position: B+</li><li>• Other position and all ranges: 0V</li></ul></li><li>▪ TCM terminal 2N<ul style="list-style-type: none"><li>• N position: B+</li><li>• Other position and all range: 0V</li></ul></li><li>▪ TCM terminal 2K<ul style="list-style-type: none"><li>• D range: B+</li><li>• Other ranges and all positions: 0V</li></ul></li></ul></li><li>• Are any of following terminal voltage turned on for even a moment while shifting selector lever slowly from P position to D range?</li></ul>		
4	<b>INSPECT TR SWITCH CIRCUIT</b> <ul style="list-style-type: none"><li>• Are all terminal voltage <b>0 V</b> in Step 3?</li></ul>	Yes	Go to Step 10.
		No	Go to the next step.
5	<b>INSPECT TR SWITCH CIRCUIT</b> <ul style="list-style-type: none"><li>• Are there two or more terminals where the voltage is abnormal in Step 3?</li></ul>	Yes	Adjust the TR switch, then go to Step 13.  (See <b>TRANSMISSION RANGE (TR) SWITCH ADJUSTMENT [SJ6A-EL].</b> )
		No	Go to the next step.
6	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"><li>• Turn the ignition switch to the LOCK position.</li><li>• Disconnect the TCM connector.</li><li>• Inspect for poor connection at TCM terminals 2O, 2K, 2M and 2N (such as damaged/pulled-out pins, corrosion).</li><li>• Is there any malfunction?</li></ul>	Yes	Repair or replace the connector and/or terminal, then go to Step 13.
		No	Go to the next step.
7	<b>INSPECT TR SWITCH SIGNAL CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"><li>• Inspect for continuity between TR switch terminals (wiring harness-side) and body ground.<ul style="list-style-type: none"><li>▪ P position: B and body ground</li><li>▪ R position: C and body ground</li></ul></li></ul>	Yes	Repair or replace the wiring harness for short to ground, go to Step 12.
		No	Go to the next step.

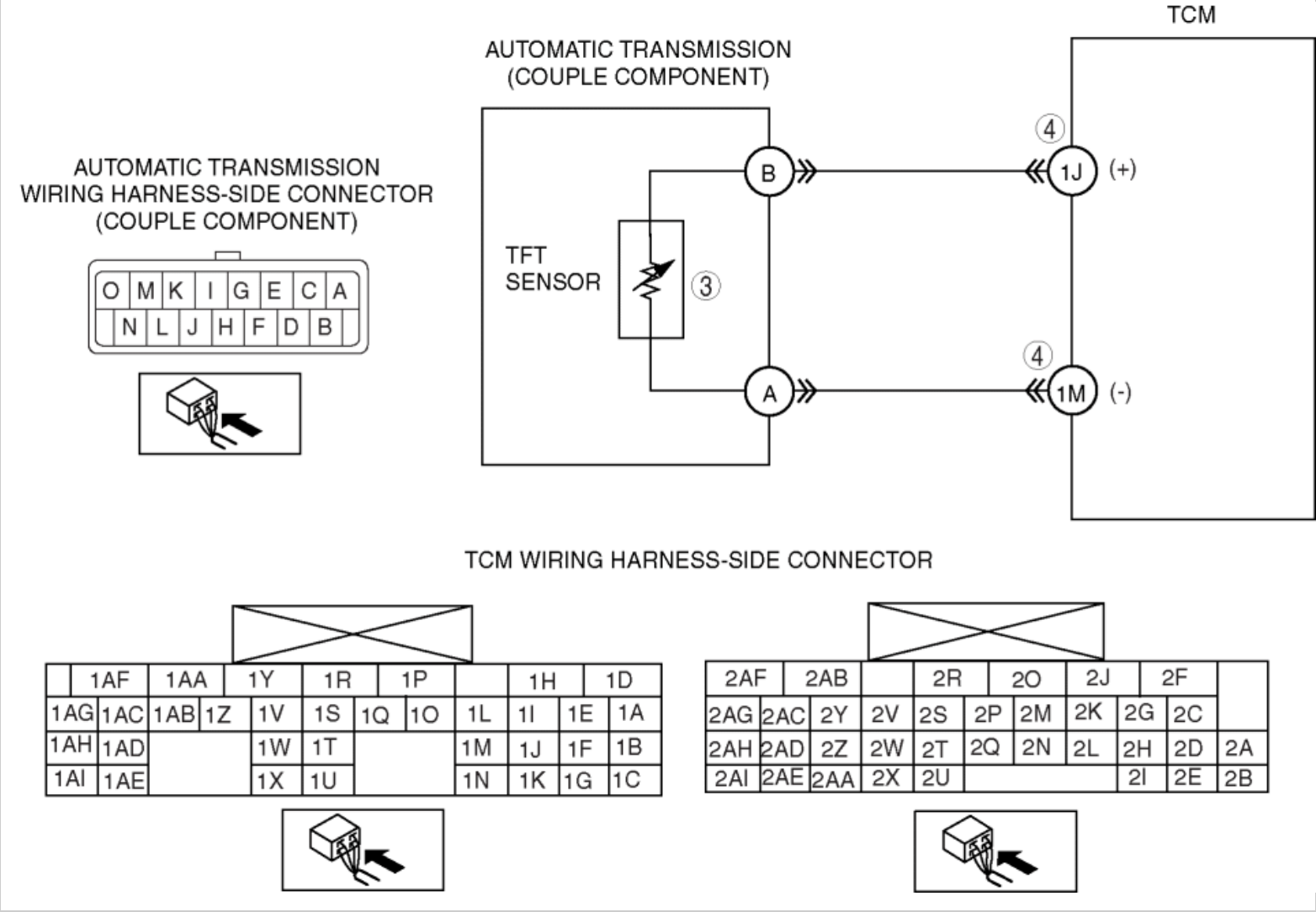
	<p>N position: H and body ground</p> <ul style="list-style-type: none"><li>▪ D range: D and body ground</li></ul> <ul style="list-style-type: none"><li>• Is there continuity?</li></ul>		
8	<p><b>INSPECT TR SWITCH CONNECTOR FOR POOR CONNECTION</b></p> <ul style="list-style-type: none"><li>• Disconnect the TR switch connector.</li><li>• Inspect for poor connection at TR switch terminals B, C, D and H (part-side) (such as damaged/pulled-out pins, corrosion)</li><li>• Are TR switch terminals normal?</li></ul>	Yes	Go to the next step.
		No	Repair terminals or replace the TR switch, then go to Step 13.  (See <b>TRANSMISSION RANGE (TR) SWITCH REMOVAL/INSTALLATION [SJ6A-EL]</b> .)
9	<p><b>INSPECT TR SWITCH</b></p> <ul style="list-style-type: none"><li>• Inspect the TR switch.</li></ul> <p>(See <b>TRANSMISSION RANGE (TR) SWITCH INSPECTION [SJ6A-EL]</b>.)</p> <ul style="list-style-type: none"><li>• Is the TR switch normal?</li></ul>	Yes	Repair or replace the wiring harness for open circuit, then go to Step 13.
		No	Replace the TR switch, then go to Step 13.  (See <b>TRANSMISSION RANGE (TR) SWITCH REMOVAL/INSTALLATION [SJ6A-EL]</b> .)
10	<p><b>INSPECT TR SWITCH POWER CIRCUIT FOR OPEN CIRCUIT</b></p> <ul style="list-style-type: none"><li>• Turn the ignition switch to the LOCK position.</li><li>• Disconnect the TR switch connector.</li><li>• Turn the ignition switch to the ON position (engine off).</li><li>• Inspect the voltage at TR switch (wiring harness-side) terminal E.</li><li>• Is there <b>B+</b> at TR switch (wiring harness-side) terminal E?</li></ul>	Yes	Go to the next step.
		No	Inspect the METER 15 A fuse. <ul style="list-style-type: none"><li>• If normal, repair or replace the wiring harness, then go to Step 13.</li></ul>
11	<p><b>INSPECT TR SWITCH CONNECTOR FOR POOR CONNECTION</b></p> <ul style="list-style-type: none"><li>• Disconnect the TR switch connector.</li><li>• Inspect for poor connection at TR switch terminal E (part-side) (such as damaged/pulled-out pins, corrosion)</li><li>• Are TR switch terminals normal?</li></ul>	Yes	Go to the next step.
		No	Repair terminals or replace the TR switch, then go to Step 13.  (See <b>TRANSMISSION RANGE (TR) SWITCH REMOVAL/INSTALLATION [SJ6A-EL]</b> .)
12	<p><b>INSPECT TR SWITCH</b></p> <ul style="list-style-type: none"><li>• Inspect the TR switch.</li></ul> <p>(See <b>TRANSMISSION RANGE (TR) SWITCH INSPECTION [SJ6A-EL]</b>.)</p> <ul style="list-style-type: none"><li>• Is the TR switch normal?</li></ul>	Yes	Go to the next step.
		No	Replace the TR switch, then go to the next step.  (See <b>TRANSMISSION RANGE (TR) SWITCH REMOVAL/INSTALLATION [SJ6A-EL]</b> .)
13	<p><b>VERIFY TROUBLESHOOTING OF DTC P0708 COMPLETED</b></p> <ul style="list-style-type: none"><li>• Make sure to reconnect all the disconnected connectors.</li><li>• Clear the DTC from the memory using the M-MDS.</li><li>• Drive the vehicle in each range (P—D).</li><li>• Drive the vehicle with vehicle speed of <b>30 km/h { 18.6 mph} or more</b> for <b>2 s or more</b>.</li></ul>	Yes	Replace the TCM, then go to the next step.  (See <b>TCM REMOVAL/INSTALLATION [SJ6A-EL]</b> .)
		No	Go to the next step.

	<ul style="list-style-type: none"><li>Is PENDING CODE for this the DTC present?</li></ul>		
14	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>Perform the "After Repair Procedure". (See <b>AFTER REPAIR PROCEDURE [SJ6A-EL]</b>.)</li><li>Are any DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [SJ6A-EL]</b> .)
		No	Troubleshooting completed.

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DTC P0711 [SJ6A-EL]

DTC P0711	Transmission fluid temperature (TFT) sensor malfunction (stuck)
DETECTION CONDITION	<ul style="list-style-type: none"><li>Change in ATF temperature cannot be detected for <b>10 min or more</b> when driving in D range or R position.</li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>The MIL illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles.</li><li>PENDING CODE is available.</li><li>FREEZE FRAME DATA is available.</li><li>The AT warning light illuminates.</li><li>The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>TFT sensor malfunction</li><li>Damaged connector between TFT sensor and TCM</li><li>TCM malfunction</li></ul>



Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	YesGo to the next step.
		NoRecord the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	YesPerform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		NoGo to the next step.
3	<b>INSPECT RESISTANCE OF TFT SENSOR CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for resistance between TCM terminals 1J and 1M (wiring harness-side).</li> <li>Is resistance as shown below? <ul style="list-style-type: none"> <li>ATF temperature <b>10°C {50°F}</b>: <b>approx. 6.445 kilohms</b></li> <li>ATF temperature <b>25°C {77°F}</b>:</li> </ul> </li> </ul>	YesGo to the next step.
		NoReplace the TFT sensor, then go to Step 5.  (See <a href="#">TRANSMISSION FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION [SJ6A-EL].</a> )

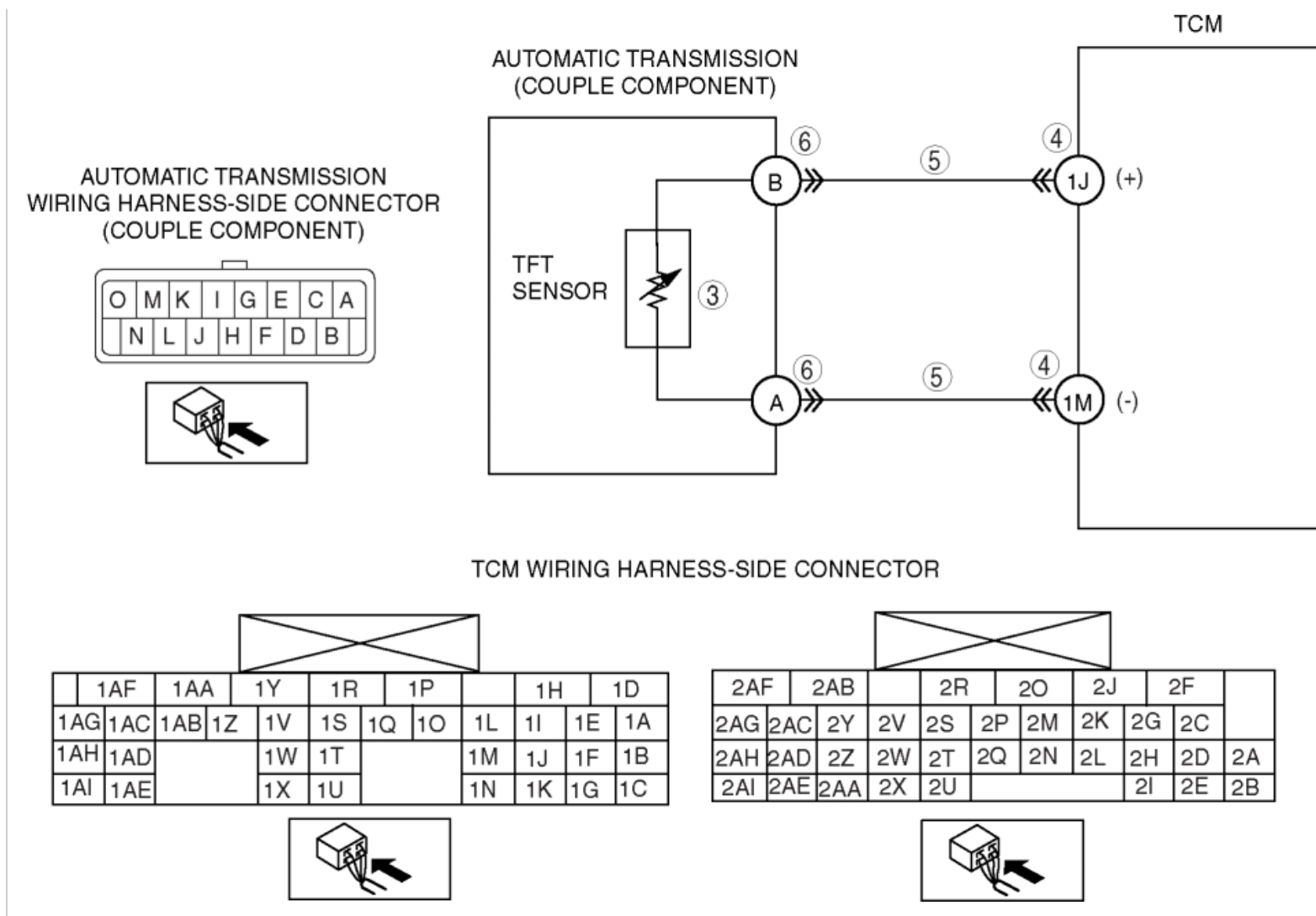
	<p><b>approx. 3.5 kilohms</b></p> <ul style="list-style-type: none"> <li>▪ ATF temperature <b>110°C {230°F}</b> : <b>approx. 0.247 kilohms</b></li> </ul> <p>(See <b>TRANSMISSION FLUID TEMPERATURE (TFT) SENSOR INSPECTION [SJ6A-EL].</b>)</p>		
4	<p><b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b></p> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Disconnect the TCM connector.</li> <li>• Inspect for poor connection at TCM terminals 1J and 1M (such as damaged/pulled-out pins, corrosion).</li> <li>• Are terminals normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to the next step.
5	<p><b>VERIFY TROUBLESHOOTING OF DTC P0711 COMPLETED</b></p> <ul style="list-style-type: none"> <li>• Make sure to reconnect all the disconnected connectors.</li> <li>• Clear the DTC from the memory using the M-MDS.</li> <li>• Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li> <li>• Is PENDING CODE for this the DTC present?</li> </ul>	Yes	Replace the TCM, then go to the next step. (See <b>TCM REMOVAL/INSTALLATION [SJ6A-EL].</b> )
		No	Go to the next step.
6	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"> <li>• Perform the "After Repair Procedure". (See <b>AFTER REPAIR PROCEDURE [SJ6A-EL].</b>)</li> <li>• Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [SJ6A-EL].</b> )
		No	Troubleshooting completed.

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DTC P0712 [SJ6A-EL]

DTC P0712	Transmission fluid temperature (TFT) sensor circuit malfunction (short to ground)
DETECTION CONDITION	<ul style="list-style-type: none"><li>• If the TCM detects the following condition for <b>10 s or more</b>, the TCM determines that the TFT sensor circuit has a malfunction.<ul style="list-style-type: none"><li>▪ ATF temperature <b>200 °C {392 °F} or more</b></li></ul></li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>• The MIL illuminates if the TCM detects the above malfunction condition during first drive cycle.</li><li>• A PENDING CODE is not available.</li><li>• FREEZE FRAME DATA is available.</li><li>• The AT warning light illuminates.</li><li>• The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• TFT sensor malfunction</li><li>• Short to ground in wiring harness between TFT sensor and TCM terminal 1J</li><li>• Short to ground in wiring harness between TFT sensor and TCM terminal 1M</li><li>• Damaged connector between TFT sensor and TCM</li><li>• TCM malfunction</li></ul>





## Diagnostic procedure

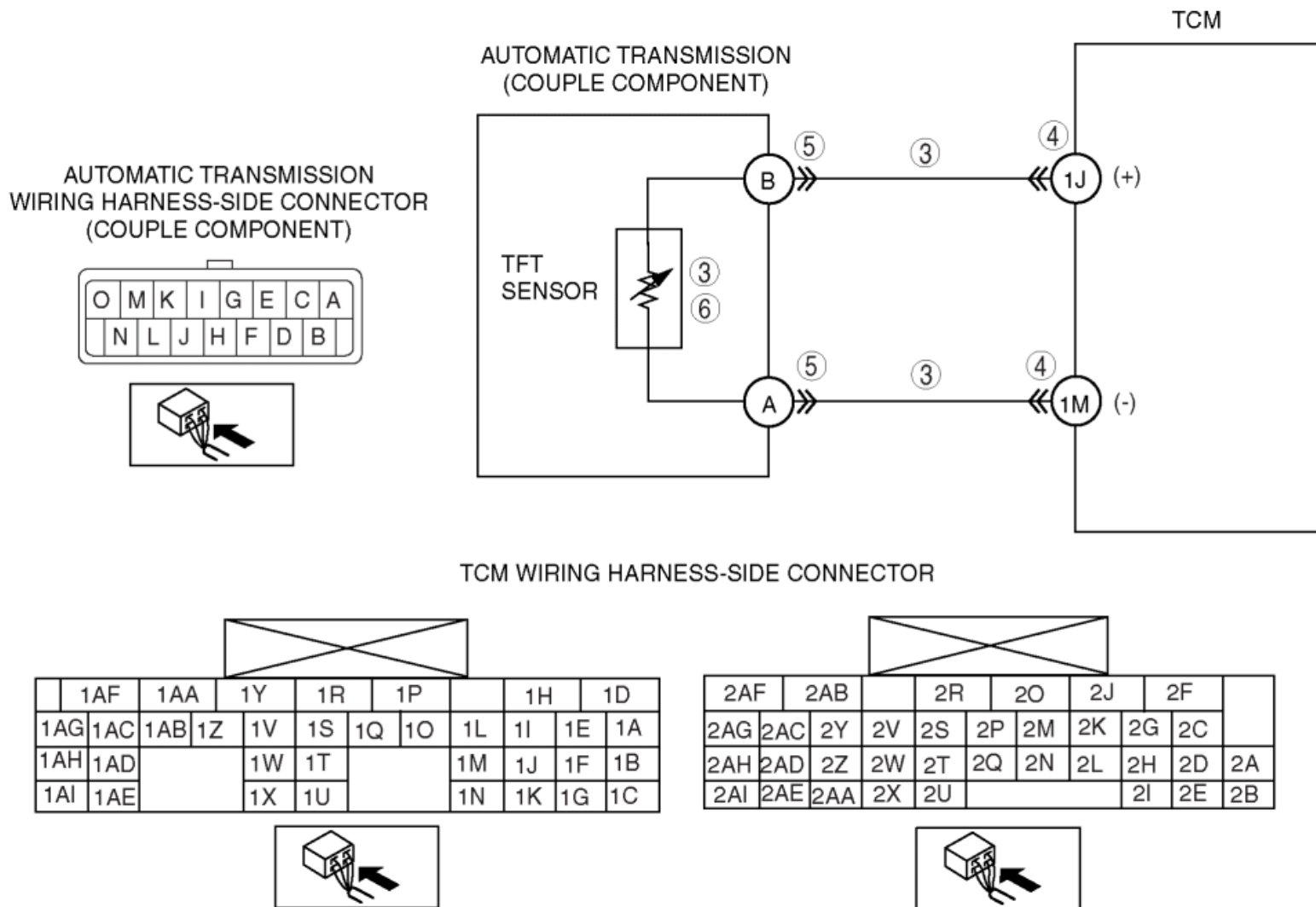
STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>INSPECT RESISTANCE OF TFT SENSOR CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for resistance between couple component terminals 1J and 1M (wiring harness-side).</li> <li>Is resistance as shown below?               <ul style="list-style-type: none"> <li>ATF temperature <b>10°C {50°F}</b>: <b>approx. 6.445 kilohms</b></li> <li>ATF temperature <b>25°C {77°F}</b>:</li> </ul> </li> </ul>	Yes Go to the next step.
		No Replace the TFT sensor, then go to Step 5.  (See <a href="#">TRANSMISSION FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION [SJ6A-EL].</a> )

	<p><b>approx. 3.5 kilohms</b></p> <ul style="list-style-type: none"> <li>▪ ATF temperature <b>110°C {230°F}</b> : <b>approx. 0.247 kilohms</b></li> </ul> <p>(See <b>TRANSMISSION FLUID TEMPERATURE (TFT) SENSOR INSPECTION [SJ6A-EL]</b>.)</p>		
4	<p><b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b></p> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Disconnect the TCM connector.</li> <li>• Inspect for poor connection at TCM terminals 1J and 1M (such as damaged/pulled-out pins, corrosion).</li> <li>• Are terminals normal?</li> </ul>	Yes	Go to Step 7.
		No	Repair or replace the connector and/or terminal, then go to Step 7.
5	<p><b>INSPECT TFT SENSOR SIGNAL CIRCUIT FOR SHORT TO GROUND</b></p> <ul style="list-style-type: none"> <li>• Inspect for continuity between couple component terminals (wiring harness-side) and body ground. <ul style="list-style-type: none"> <li>▪ Terminal A and body ground</li> <li>▪ Terminal B and body ground</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness for short to ground, go to Step 7.
		No	Go to the next step.
6	<p><b>INSPECT COUPLE COMPONENT CONNECTOR FOR POOR CONNECTION</b></p> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Disconnect the couple component connector.</li> <li>• Inspect for poor connection at couple component terminals A and B (such as damaged/pulled-out pins, corrosion).</li> <li>• Are terminals normal?</li> </ul>	Yes	Replace the TFT sensor, then go to the next step.  (See <b>TRANSMISSION FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION [SJ6A-EL]</b> .)
		No	Repair or replace the connector and/or terminal, then go to the next step.
7	<p><b>VERIFY TROUBLESHOOTING OF DTC P0712 COMPLETED</b></p> <ul style="list-style-type: none"> <li>• Make sure to reconnect all the disconnected connectors.</li> <li>• Clear the DTC from the memory using the M-MDS.</li> <li>• Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li> <li>• Is same DTC present?</li> </ul>	Yes	Replace the TCM, then go to the next step.  (See <b>TCM REMOVAL/INSTALLATION [SJ6A-EL]</b> .)
		No	Go to the next step.
8	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"> <li>• Perform the "After Repair Procedure". (See <b>AFTER REPAIR PROCEDURE [SJ6A-EL]</b>.)</li> <li>• Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection.  (See <b>DTC TABLE [SJ6A-EL]</b> .)
		No	Troubleshooting completed.

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DTC P0713 [SJ6A-EL]

DTC P0713	Transmission fluid temperature (TFT) sensor circuit malfunction (short to power/open circuit)
DETECTION CONDITION	<ul style="list-style-type: none"><li>• If the TCM detects the following condition for <b>1 s or more</b>, the TCM determines that the TFT sensor circuit has a malfunction.<ul style="list-style-type: none"><li>▪ Engine warmed-up</li><li>▪ ATF temperature <b>less than –43 °C {–45.4 °F}</b></li></ul></li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>• The MIL illuminates if the TCM detects the above malfunction condition during first drive cycle.</li><li>• A PENDING CODE is not available.</li><li>• FREEZE FRAME DATA is available.</li><li>• The AT warning light illuminates.</li><li>• The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• TFT sensor malfunction</li><li>• Open circuit in wiring harness between TFT sensor and TCM terminal 1J</li><li>• Open circuit in wiring harness between TFT sensor and TCM terminal 1M</li><li>• Short to power in wiring harness between TFT sensor and TCM terminal 1J</li><li>• Short to power in wiring harness between TFT sensor and TCM terminal 1M</li><li>• Damaged connector between TFT sensor and TCM</li><li>• TCM malfunction</li></ul>



## Diagnostic procedure

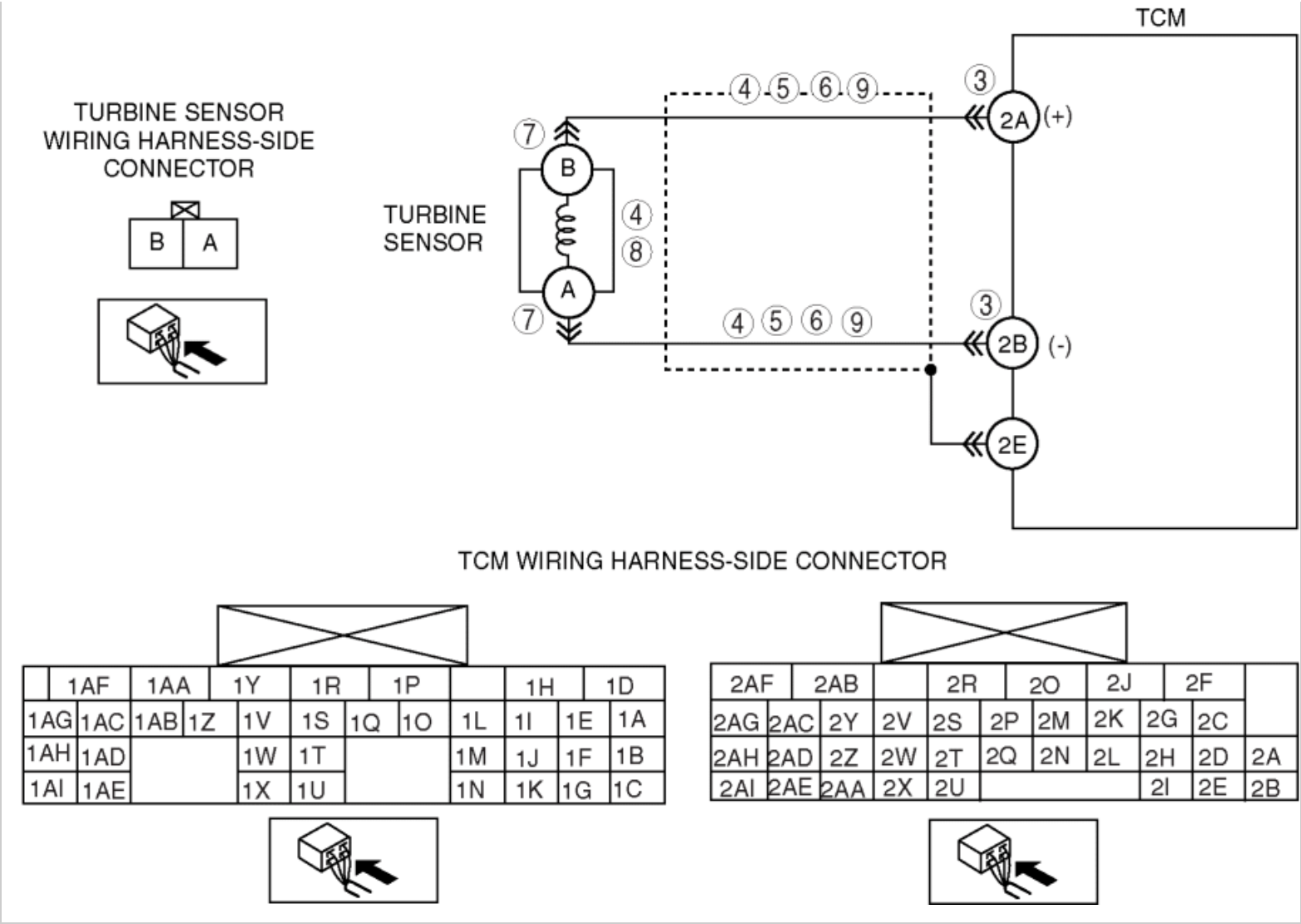
STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>INSPECT RESISTANCE OF TFT SENSOR CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for resistance between couple component terminals 1J and 1M (wiring harness-side).</li> <li>Is resistance as shown below? <ul style="list-style-type: none"> <li>ATF temperature <b>10°C {50°F}</b>: <b>approx. 6.445 kilohms</b></li> <li>ATF temperature <b>25°C {77°F}</b>:</li> </ul> </li> </ul>	Yes Go to the next step.
		No Go to Step 5.

	<p><b>approx. 3.5 kilohms</b></p> <ul style="list-style-type: none"> <li>ATF temperature <b>110°C {230°F}</b> : <b>approx. 0.247 kilohms</b></li> </ul> <p>(See <a href="#">TRANSMISSION FLUID TEMPERATURE (TFT) SENSOR INSPECTION [SJ6A-EL].</a>)</p>		
4	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the TCM connector.</li> <li>Inspect for poor connection at TCM terminals 1J and 1M (such as damaged/pulled-out pins, corrosion).</li> <li>Are terminals normal?</li> </ul>	Yes	Go to Step 7.
		No	Repair or replace the connector and/or terminal, then go to Step 7.
5	<b>INSPECT COUPLE COMPONENT CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Disconnect the couple component connector.</li> <li>Inspect for poor connection at TCM terminals A and B (such as damaged/pulled-out pins, corrosion).</li> <li>Are terminals normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 7.
6	<b>INSPECT TFT SENSOR</b> <ul style="list-style-type: none"> <li>Inspect the TFT sensor.</li> </ul> <p>(See <a href="#">TRANSMISSION FLUID TEMPERATURE (TFT) SENSOR INSPECTION [SJ6A-EL].</a>)</p> <ul style="list-style-type: none"> <li>Is the TFT sensor normal?</li> </ul>	Yes	Repair or replace the wiring harness for open circuit, go to the next step.
		No	Replace the TFT sensor, then go to the next step.  (See <a href="#">TRANSMISSION FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION [SJ6A-EL].</a> )
7	<b>VERIFY TROUBLESHOOTING OF DTC P0713 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all the disconnected connectors.</li> <li>Clear the DTC from the memory using the M-MDS.</li> <li>Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li> <li>Is same DTC present?</li> </ul>	Yes	Replace the TCM, then go to the next step.  (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL].</a> )
		No	Go to the next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the "After Repair Procedure".</li> </ul> <p>(See <a href="#">AFTER REPAIR PROCEDURE [SJ6A-EL].</a>)</p> <ul style="list-style-type: none"> <li>Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection.  (See <a href="#">DTC TABLE [SJ6A-EL].</a> )
		No	Troubleshooting completed.

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DTC P0717 [SJ6A-EL]

DTC P0717	Turbine sensor circuit malfunction (open circuit/short circuit)
DETECTION CONDITION	<ul style="list-style-type: none"><li>When all conditions below are satisfied.<ul style="list-style-type: none"><li>D range of TR switch input</li><li>Vehicle speed signal 12 pulse input</li><li>Turbine sensor signal not input</li></ul></li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>The MIL illuminates if the TCM detects the above malfunction condition during the first drive cycle.</li><li>A PENDING CODE is not available.</li><li>FREEZE FRAME DATA is available.</li><li>The AT warning light illuminates.</li><li>The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Turbine sensor malfunction</li><li>Open circuit between turbine sensor terminal B and TCM terminal 2A</li><li>Open circuit between turbine sensor terminal A and TCM terminal 2B</li><li>Short to ground in wiring harness between turbine sensor terminal B and TCM terminal 2A</li><li>Short to ground in wiring harness between turbine sensor terminal A and TCM terminal 2B</li><li>Short to power in wiring harness between turbine sensor terminal B and TCM terminal 2A</li><li>Short to power in wiring harness between turbine sensor terminal A and TCM terminal 2B</li><li>Damaged connector between turbine sensor and TCM</li><li>TCM malfunction</li></ul>



Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"><li>Has the FREEZE FRAME DATA been recorded?</li></ul>	<div>YesGo to the next step.</div> <div>NoRecord the FREEZE FRAME DATA on the repair order, then go to the next step.</div>
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"><li>Verify related Service Bulletins and/or on-line repair information availability.</li><li>Is any related repair information available?</li></ul>	<div>YesPerform repair or diagnosis according to the available repair information.<ul style="list-style-type: none"><li>If the vehicle is not repaired, go to the next step.</li></ul></div> <div>NoGo to the next step.</div>
3	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"><li>Turn the ignition switch to the LOCK position.</li><li>Disconnect the TCM connector.</li><li>Inspect for poor connection at TCM terminals R18 and R7</li></ul>	<div>YesGo to the next step.</div> <div>NoRepair or replace the connector and/or terminal, then go to Step 13.</div>

	<p>(such as damaged/pulled-out pins, corrosion).</p> <ul style="list-style-type: none"> <li>• Are terminals normal?</li> </ul>		
4	<b>INSPECT CONTINUITY OF TURBINE SENSOR CIRCUIT</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between the TCM terminals 2A and 2B (wiring harness-side).</li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Go to Step 7.
5	<b>INSPECT TURBINE SENSOR SIGNAL CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between the TCM terminals (wiring harness-side) and body ground. <ul style="list-style-type: none"> <li>▪ Terminal 2A and body ground</li> <li>▪ Terminal 2B and body ground</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for short to ground, then go to Step 10.
6	<b>INSPECT TURBINE SENSOR CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position (engine off).</li> <li>• Measure the voltage at TCM (wiring harness-side) terminals 2A and 2B.</li> <li>• Is there <b>0 V</b> at the TCM wiring harness-side connector terminals?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for short to power supply, then go to Step 10.
7	<b>INSPECT TERMINAL TURBINE SENSOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Disconnect the turbine sensor connector.</li> <li>• Inspect for poor connection at turbine sensor terminals A and B (such as damaged/pulled-out pins, corrosion).</li> <li>• Are terminals normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 10.
8	<b>INSPECT TURBINE SENSOR</b> <ul style="list-style-type: none"> <li>• Inspect the turbine sensor. (See <a href="#">TURBINE SENSOR INSPECTION [SJ6A-EL]</a>.)</li> <li>• Is the turbine sensor normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the turbine sensor, then go to Step 10.  (See <a href="#">TURBINE SENSOR REMOVAL/INSTALLATION [SJ6A-EL]</a> .)
9	<b>INSPECT TURBINE SENSOR CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between turbine sensor terminals (wiring harness-side) and TCM terminals (wiring harness-side). <ul style="list-style-type: none"> <li>▪ Terminal B and terminal 2A</li> <li>▪ Terminal A and terminal 2B</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to the next step.
10	<b>VERIFY TROUBLESHOOTING OF DTC P0717 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all the disconnected connectors.</li> <li>• Clear the DTC from the memory using the M-MDS.</li> </ul>	Yes	Replace the TCM, then go to the next step.  (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL]</a> .)



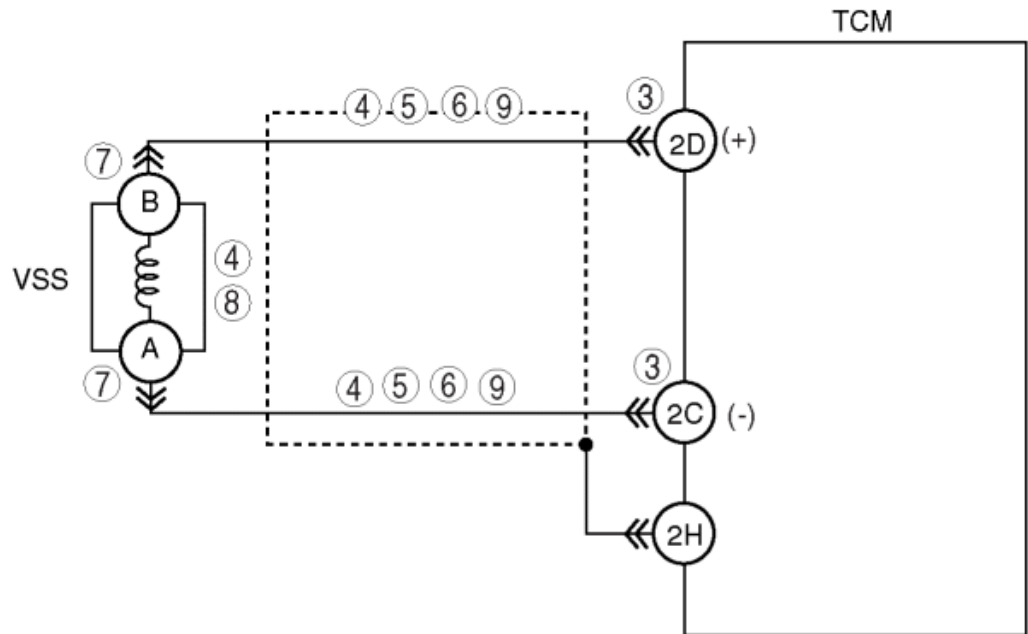
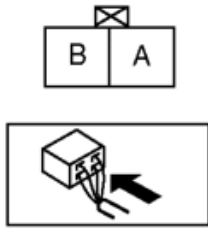
	<ul style="list-style-type: none"><li>• Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li><li>• Is same DTC present?</li></ul>	No	Go to the next step.
11	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the “After Repair Procedure”. (See <b>AFTER REPAIR PROCEDURE [SJ6A-EL]</b>.)</li><li>• Are any DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [SJ6A-EL]</b> .)
		No	Troubleshooting completed.

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DTC P0722 [SJ6A-EL]

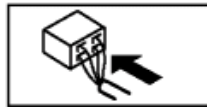
DTC P0722	Vehicle speed sensor (VSS) circuit malfunction (open circuit/short circuit)
DETECTION CONDITION	<ul style="list-style-type: none"><li>When all conditions below are satisfied.<ul style="list-style-type: none"><li>D range of TR switch input</li><li>Turbine speed signal 12 pulse input</li><li>VSS signal not input</li></ul></li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>The MIL illuminates if the TCM detects the above malfunction condition during the first drive cycle.</li><li>A PENDING CODE is not available.</li><li>FREEZE FRAME DATA is available.</li><li>The AT warning light illuminates.</li><li>The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>VSS malfunction</li><li>Open circuit between VSS terminal B and TCM terminal 2D</li><li>Open circuit between VSS terminal A and TCM terminal 2C</li><li>Short to ground in wiring harness between VSS terminal B and TCM terminal 2D</li><li>Short to ground in wiring harness between VSS terminal A and TCM terminal 2C</li><li>Short to power in wiring harness between VSS terminal B and TCM terminal 2D</li><li>Short to power in wiring harness between VSS terminal A and TCM terminal 2C</li><li>Damaged connector between VSS and TCM</li><li>TCM malfunction</li></ul>

VSS  
WIRING HARNESS-SIDE  
CONNECTOR

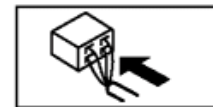


TCM WIRING HARNESS-SIDE CONNECTOR

1AF	1AA	1Y	1R	1P		1H	1D				
1AG	1AC	1AB	1Z	1V	1S	1Q	1O	1L	1I	1E	1A
1AH	1AD			1W	1T			1M	1J	1F	1B
1AI	1AE			1X	1U			1N	1K	1G	1C



2AF	2AB			2R	2O	2J	2F				
2AG	2AC	2Y	2V	2S	2P	2M	2K	2G	2C		
2AH	2AD	2Z	2W	2T	2Q	2N	2L	2H	2D	2A	
2AI	2AE	2AA	2X	2U				2I	2E	2B	



Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Record the FREEZE FRAME DATA on the repair order, then go to the next step.</p>
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	<p>Yes Perform repair or diagnosis according to the available repair information.</p> <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> <p>No Go to the next step.</p>
3	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the TCM connector.</li> <li>Inspect for poor connection at TCM terminals 2D and 2C (such as damaged/pulled-out pins, corrosion).</li> </ul>	<p>Yes Go to the next step.</p> <p>No Repair or replace the connector and/or terminal, then go to Step 13.</p>

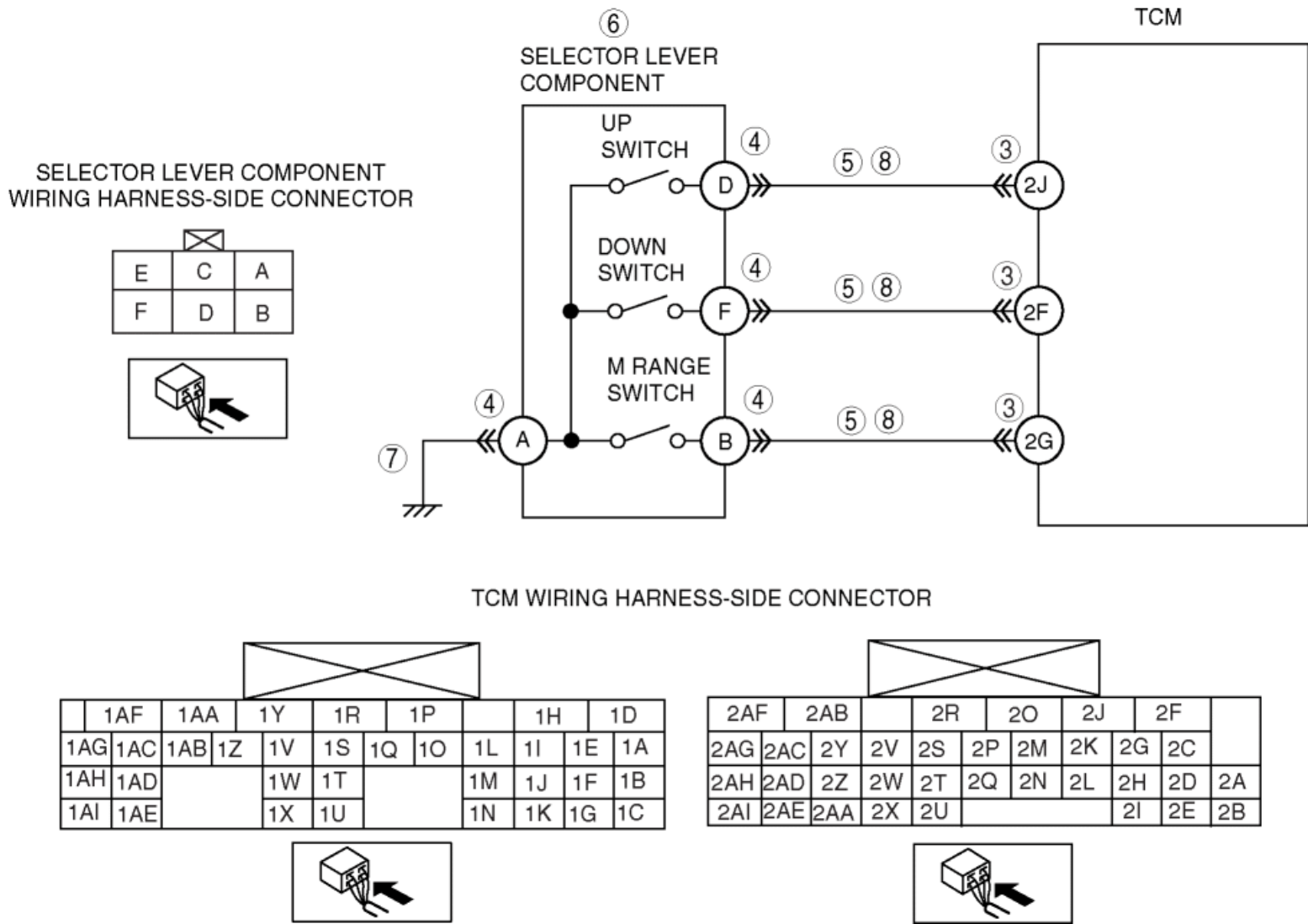
	<ul style="list-style-type: none"> <li>• Are terminals normal?</li> </ul>		
4	<b>INSPECT CONTINUITY OF VSS CIRCUIT</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between the couple component terminals 2D and 2C (wiring harness-side).</li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Go to Step 7.
5	<b>INSPECT VSS SIGNAL CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between the TCM terminals (wiring harness-side) and body ground. <ul style="list-style-type: none"> <li>▪ Terminal 2D and body ground</li> <li>▪ Terminal 2C and body ground</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for short to ground, then go to Step 10.
6	<b>INSPECT VSS CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position (engine off).</li> <li>• Measure the voltage at TCM (wiring harness-side) terminals 2D and 2C.</li> <li>• Is there <b>0 V</b> at the TCM wiring harness-side connector terminals?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for short to power supply, then go to Step 10.
7	<b>INSPECT TERMINAL VSS FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Disconnect the VSS connector.</li> <li>• Inspect for poor connection at VSS terminals A and B (such as damaged/pulled-out pins, corrosion).</li> <li>• Are terminals normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 10.
8	<b>INSPECT VSS</b> <ul style="list-style-type: none"> <li>• Inspect the VSS. (See <b>VEHICLE SPEED SENSOR (VSS) INSPECTION [SJ6A-EL]</b>.)</li> <li>• Is the VSS normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the VSS, then go to Step 10. (See <b>VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION [SJ6A-EL]</b> .)
9	<b>INSPECT VSS CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between VSS terminals (wiring harness-side) and TCM terminals (wiring harness-side). <ul style="list-style-type: none"> <li>▪ Terminal B and terminal 2D</li> <li>▪ Terminal A and terminal 2C</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for open circuit, then go to the next step.
10	<b>VERIFY TROUBLESHOOTING OF DTC P0722 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all the disconnected connectors.</li> <li>• Clear the DTC from the memory using the M-MDS.</li> <li>• Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li> </ul>	Yes	Replace the TCM, then go to the next step. (See <b>TCM REMOVAL/INSTALLATION [SJ6A-EL]</b> .)
		No	Go to the next step.

	<ul style="list-style-type: none"><li>Is same DTC present?</li></ul>		
11	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>Perform the “After Repair Procedure”. (See <b>AFTER REPAIR PROCEDURE [SJ6A-EL]</b>.)</li><li>Are any DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [SJ6A-EL]</b> .)
		No	Troubleshooting completed.

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DTC P0819 [SJ6A-EL]

DTC P0819	Manual switch/up switch/down switch circuit malfunction (open circuit/short circuit)
DETECTION CONDITION	<p><b>M range switch circuit malfunction</b></p> <ul style="list-style-type: none"><li>• M range switch remains on for <b>2 s or more</b> except in D range.</li></ul> <p><b>Up switch or down switch circuit malfunction</b></p> <ul style="list-style-type: none"><li>• When all of the following conditions are met:<ul style="list-style-type: none"><li>▪ M range switch off.</li><li>▪ Except D range</li><li>▪ Up or down switch remains on for <b>10 s or more</b>.</li></ul></li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>• The MIL does not illuminate if the TCM detects the above malfunction condition during the first drive cycle.</li><li>• A PENDING CODE is not available.</li><li>• FREEZE FRAME DATA is available.</li><li>• The AT warning light illuminates.</li><li>• The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• M range switch malfunction</li><li>• Up switch malfunction</li><li>• Down switch malfunction.</li><li>• Open circuit in wiring harness between selector lever component terminal D and TCM terminal 2J</li><li>• Open circuit in wiring harness between selector lever component terminal F and TCM terminal 2F</li><li>• Open circuit in wiring harness between selector lever component terminal B and TCM terminal 2G</li><li>• Open circuit in wiring harness between selector lever component terminal A and ground</li><li>• Short to ground in wiring harness between selector lever component terminal D and TCM terminal 2J</li><li>• Short to ground in wiring harness between selector lever component terminal F and TCM terminal 2F</li><li>• Short to ground in wiring harness between selector lever component terminal Band TCM terminal 2G</li><li>• Damaged connector between selector lever component and TCM</li><li>• TCM malfunction</li></ul>



**Diagnostic procedure**

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	YesGo to the next step.
		NoRecord the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	YesPerform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		NoGo to the next step.
3	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Disconnect the TCM connector.</li> <li>Inspect for poor connection at TCM terminals 2F, 2G and 2J (such as damaged/pulled-out pins, corrosion).</li> <li>Are terminals normal?</li> </ul>	YesGo to the next step.
		NoRepair or replace the connector and/or terminal, then go to Step 9.

4	<b>INSPECT SELECTOR LEVER COMPONENT CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Disconnect the selector lever component connector.</li> <li>• Inspect for poor connection at selector lever component terminals A, B, D and F (such as damaged/pulled-out pins, corrosion).</li> <li>• Are terminals normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 9.
5	<b>INSPECT M RANGE SWITCH, UP SWITCH, AND DOWN SWITCH CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between selector lever component terminals (wiring harness-side) and body ground. <ul style="list-style-type: none"> <li>▪ Terminal B and body ground (M range switch)</li> <li>▪ Terminal D and body ground (up switch)</li> <li>▪ Terminal F and body ground (down switch)</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes	Repair or replace the harness, then go to Step 9.
		No	Go to the next step.
6	<b>INSPECT M RANGE SWITCH, UP SWITCH, AND DOWN SWITCH</b> <ul style="list-style-type: none"> <li>• Inspect the M range switch, up switch, and down switch. (See <a href="#">SELECTOR LEVER INSPECTION</a>)</li> <li>• Are the switches normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the selector lever, then go to Step 9.  (See <a href="#">SELECTOR LEVER REMOVAL/INSTALLATION.</a> )
7	<b>INSPECT M RANGE SWITCH, UP SWITCH, AND DOWN SWITCH CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between selector lever component terminal A (wiring harness-side) and body ground.</li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the harness, then go to Step 9.
8	<b>INSPECT M RANGE SWITCH, UP SWITCH, AND DOWN SWITCH CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between TCM terminals (wiring harness-side) and selector lever component terminals (wiring harness-side). <ul style="list-style-type: none"> <li>▪ Terminal 2G and terminal B (M range switch)</li> <li>▪ Terminal 2J and terminal D (up switch)</li> <li>▪ Terminal 2F and terminal F (down switch)</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the harness, then go to the next step.
9	<b>VERIFY TROUBLESHOOTING OF DTC P0819 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all the disconnected connectors.</li> <li>• Clear the DTC from the memory using the M-MDS.</li> <li>• Drive the vehicle in M range, and change gears by shifting the selector lever (operating the up and down switches).</li> <li>• Is same DTC present?</li> </ul>	Yes	Replace the TCM, then go to the next step.  (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL.]</a> )
		No	Go to the next step.
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform the "After Repair Procedure". (See <a href="#">AFTER REPAIR PROCEDURE [SJ6A-EL.]</a>)</li> <li>• Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection.  (See <a href="#">DTC TABLE [SJ6A-EL.]</a> )
		No	Troubleshooting completed.

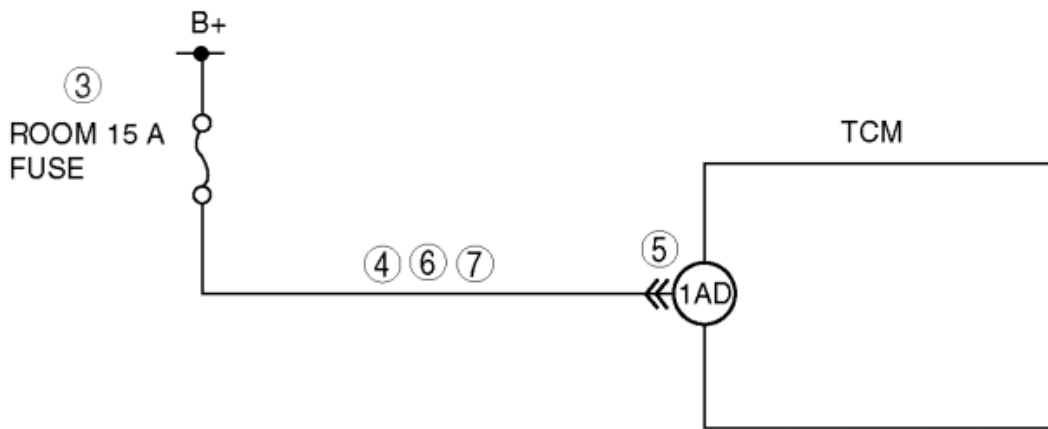




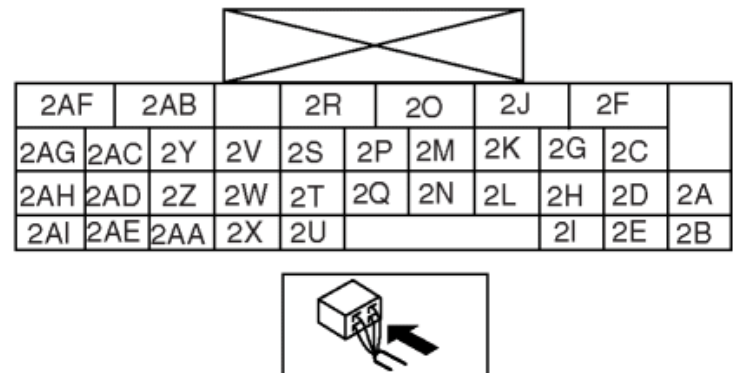
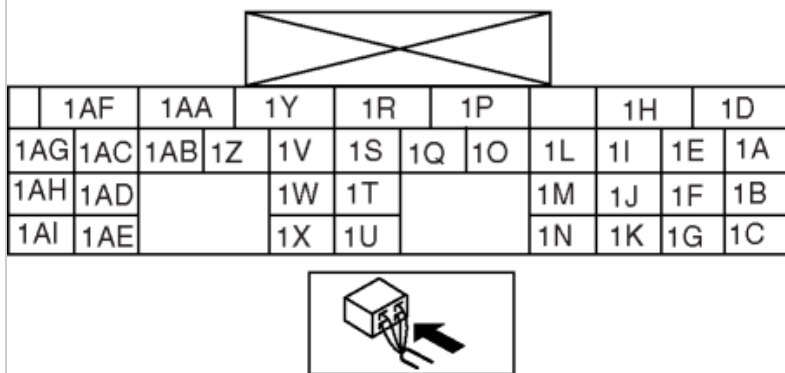
2008 - MX-5 - Transmission/Transaxle

DTC P0882 [SJ6A-EL]

DTC P0882	TCM B+ low (less than 9 V)
DETECTION CONDITION	<ul style="list-style-type: none"><li>• Voltage of <b>less than 9 V</b> detected at TCM terminal 1AD when engine is running.</li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>• The MIL does not illuminate if the TCM detects the above malfunction condition during the first drive cycle.</li><li>• A PENDING CODE is not available.</li><li>• FREEZE FRAME DATA is available.</li><li>• The AT warning light not illuminates.</li><li>• The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Melted ROOM 15 A fuse</li><li>• Open circuit in wiring harness between ROOM 15 A fuse and TCM terminal 1AD</li><li>• Short to ground in wiring harness between ROOM 15 A fuse and TCM terminal 1AD</li><li>• Poor connection of TCM connector</li><li>• Alternator malfunction</li><li>• TCM malfunction</li></ul>



TCM WIRING HARNESS-SIDE CONNECTOR



## Diagnostic procedure

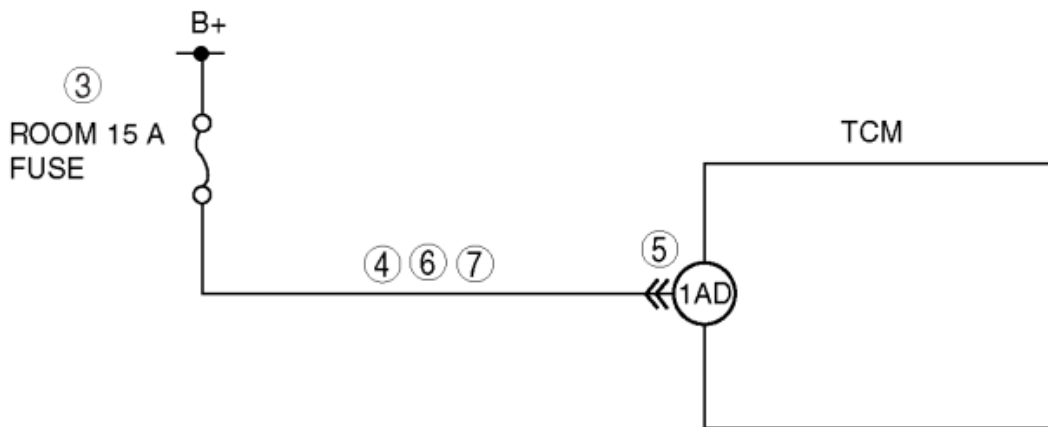
STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>INSPECT FUSE</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Inspect ROOM 15 A fuse for malfunction.</li> <li>Is it normal?</li> </ul>	Yes Go to the next step.
		No <ul style="list-style-type: none"> <li>If fuse has been melted, go to the next step.</li> <li>If fuse is not installed correctly, install it correctly, then go to Step 8.</li> </ul>
4	<b>INSPECT VOLTAGE OF POWER SUPPLY CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for voltage TCM terminal 1AD (wiring</li> </ul>	Yes Go to the next step.

	harness-side).		No	Go to Step 6.
	<ul style="list-style-type: none"> <li>Is the voltage <b>B+</b>?</li> </ul>			
5	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the TCM connector.</li> <li>Inspect for poor connection at TCM terminals 1AD (such as damaged/pulled-out pins, corrosion).</li> <li>Is terminal normal?</li> </ul>	Yes	Go to Step 8.	
		No	Repair or replace the connector and/or terminal, then go to Step 8.	
6	<b>INSPECT POWER SUPPLY CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>Disconnect the positive battery cable.</li> <li>Inspect for continuity between the fuse terminals and body ground. <ul style="list-style-type: none"> <li>ROOM 15 A fuse terminal and body ground</li> </ul> </li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness and install new fuse, then go to Step 8.	
		No	Go to the next step.	
7	<b>INSPECT POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for continuity between TCM terminal and fuse terminals (wiring harness-side). <ul style="list-style-type: none"> <li>Terminal 1AD and ROOM IG 15 A fuse</li> </ul> </li> <li>Is there continuity?</li> </ul>	Yes	Go to the next step.	
		No	Repair or replace the harness, then go to the next step.	
8	<b>VERIFY TROUBLESHOOTING OF DTC P0882 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all the disconnected connectors.</li> <li>Clear the DTC from the memory using the M-MDS.</li> <li>Start the engine and warm it up completely.</li> <li>Is same DTC present?</li> </ul>	Yes	Replace the TCM, then go to the next step. (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL]</a> .)	
		No	Go to the next step.	
9	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the "After Repair Procedure". (See <a href="#">AFTER REPAIR PROCEDURE [SJ6A-EL]</a>.)</li> <li>Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [SJ6A-EL]</a> .)	
		No	Troubleshooting completed.	

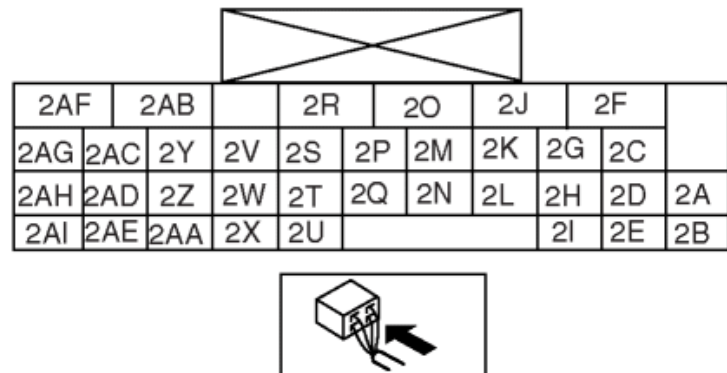
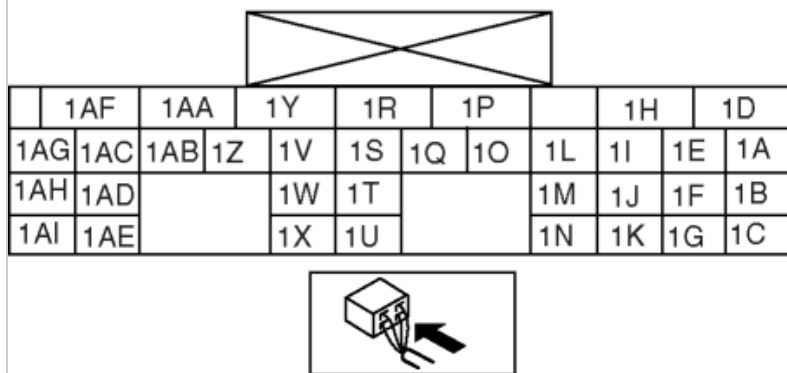
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DTC P0883 [SJ6A-EL]

DTC P0883	TCM B+ low (less than 11 V)
DETECTION CONDITION	<ul style="list-style-type: none"><li>• Voltage of <b>less than 11 V</b> detected at TCM terminal 1AD when engine is running.</li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>• The MIL does not illuminate if the TCM detects the above malfunction condition during the first drive cycle.</li><li>• A PENDING CODE is not available.</li><li>• FREEZE FRAME DATA is available.</li><li>• The AT warning light not illuminates.</li><li>• The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Melted ROOM 15 A fuse</li><li>• Open circuit in wiring harness between ROOM 15 A fuse and TCM terminal 1AD</li><li>• Short to ground in wiring harness between ROOM 15 A fuse and TCM terminal 1AD</li><li>• Poor connection of TCM connector</li><li>• Alternator malfunction</li><li>• TCM malfunction</li></ul>



TCM WIRING HARNESS-SIDE CONNECTOR



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No Go to the next step.
3	<b>INSPECT FUSE</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Inspect ROOM 15 A fuse for malfunction.</li> <li>Is it normal?</li> </ul>	Yes Go to the next step.
		No <ul style="list-style-type: none"> <li>If fuse has been melted, go to the next step.</li> <li>If fuse is not installed correctly, install it correctly, then go to Step 8.</li> </ul>
4	<b>INSPECT VOLTAGE OF POWER SUPPLY CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for voltage TCM terminal 1AD (wiring</li> </ul>	Yes Go to the next step.

	harness-side).	No	Go to Step 6.
	<ul style="list-style-type: none"> <li>Is the voltage <b>B+</b>?</li> </ul>		
5	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the TCM connector.</li> <li>Inspect for poor connection at TCM terminals 1AD (such as damaged/pulled-out pins, corrosion).</li> <li>Is terminal normal?</li> </ul>	Yes	Go to Step 8.
		No	Repair or replace the connector and/or terminal, then go to Step 8.
6	<b>INSPECT POWER SUPPLY CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>Disconnect the positive battery cable.</li> <li>Inspect for continuity between the fuse terminals and body ground. <ul style="list-style-type: none"> <li>ROOM 15 A fuse terminal and body ground</li> </ul> </li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness and install new fuse, then go to Step 8.
		No	Go to the next step.
7	<b>INSPECT POWER SUPPLY CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for continuity between TCM terminal and fuse terminals (wiring harness-side). <ul style="list-style-type: none"> <li>Terminal 1AD and ROOM IG 15 A fuse</li> </ul> </li> <li>Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the harness, then go to the next step.
8	<b>VERIFY TROUBLESHOOTING OF DTC P0883 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all the disconnected connectors.</li> <li>Clear the DTC from the memory using the M-MDS.</li> <li>Start the engine and warm it up completely.</li> <li>Is same DTC present?</li> </ul>	Yes	Replace the TCM, then go to the next step. (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL]</a> .)
		No	Go to the next step.
9	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the "After Repair Procedure". (See <a href="#">AFTER REPAIR PROCEDURE [SJ6A-EL]</a>.)</li> <li>Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [SJ6A-EL]</a> .)
		No	Troubleshooting completed.

## 2008 - MX-5 - Transmission/Transaxle

### DTC P0961 [SJ6A-EL]

DTC P0961	Line pressure control solenoid range/performance (stuck)
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>Feedback current corresponding to solenoid current command value is irregular when engine is running.</li> </ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"> <li>The MIL illuminates if the TCM detects the above malfunction condition during the first drive cycle.</li> <li>A PENDING CODE is not available.</li> <li>FREEZE FRAME DATA is available.</li> <li>The AT warning light illuminates.</li> <li>The DTC is stored in the TCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>ATF level low</li> <li>Deteriorated ATF</li> <li>Line pressure control solenoid stuck</li> <li>Control valve stuck</li> <li>TCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b>	Yes Perform repair or diagnosis according to the available repair information.
	<ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> </ul>	<ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>



	<ul style="list-style-type: none"> <li>Is any related repair information available?</li> </ul>	No	Go to the next step.
3	<b>INSPECT ATF CONDITION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Inspect the ATF condition. <ul style="list-style-type: none"> <li>Clear red: Normal</li> <li>Light red (pink): Water mixed in fluid</li> <li>Reddish brown: Deteriorated ATF</li> </ul> </li> <li>Is it normal?</li> </ul> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) INSPECTION</b>[SJ6A-EL].)</p>	Yes	Go to the next step.
		No	If the ATF color is light red or reddish brown, replace ATF, then go to Step 6.  (See <b>AUTOMATIC TRANSMISSION FLUID (ATF) REPLACEMENT</b> [SJ6A-EL].)
4	<b>INSPECT ATF LEVEL</b> <ul style="list-style-type: none"> <li>Start the engine.</li> <li>Warm up the AT.</li> <li>Is the ATF level within the specification?</li> </ul> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT</b> [SJ6A-EL].)</p>	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 6.  (See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT</b> [SJ6A-EL].)
5	<b>INSPECT LINE PRESSURE</b> <ul style="list-style-type: none"> <li>Start the engine.</li> <li>Measure the line pressure.</li> </ul> <p>(See <b>MECHANICAL SYSTEM TEST</b>[SJ6A-EL].)</p> <ul style="list-style-type: none"> <li>Are the line pressures within the specifications?</li> </ul>	Yes	Go to the next step.
		No	<ul style="list-style-type: none"> <li>All ranges: Replace the oil pump or control valve body, then go to the next step.</li> <li>Any ranges: Replace the AT, then go the next step.</li> </ul> <p>(See <b>AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION</b> [SJ6A-EL].)</p>
6	<b>VERIFY TROUBLESHOOTING OF DTC P0961 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all the disconnected connectors.</li> </ul>	Yes	Replace the TCM, then go to the next step.  (See <b>TCM REMOVAL/INSTALLATION</b> [SJ6A-EL].)

	<ul style="list-style-type: none"><li>• Clear the DTC from the memory using the M-MDS.</li><li>• Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li><li>• Is same DTC present?</li></ul>	No	Go to the next step.
7	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "After Repair Procedure".</li></ul> (See <b>AFTER REPAIR PROCEDURE [SJ6A-EL]</b> .)	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [SJ6A-EL]</b> .)
		No	Troubleshooting completed.
	<ul style="list-style-type: none"><li>• Are any DTCs present?</li></ul>		

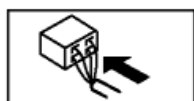
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DTC P0962 [SJ6A-EL]

DTC P0962	Line pressure control solenoid circuit malfunction (short to ground/open circuit)
DETECTION CONDITION	<ul style="list-style-type: none"><li>• Open or short circuit in line pressure control solenoid signal system (while TCM monitors solenoid output voltage, the voltage that differs from the signal output by CPU in TCM is detected).</li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>• The MIL illuminates if the TCM detects the above malfunction condition during the first drive cycle.</li><li>• A PENDING CODE is not available.</li><li>• FREEZE FRAME DATA is available.</li><li>• The AT warning light illuminates.</li><li>• The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Open circuit between line pressure control solenoid terminal B and TCM terminal 1R</li><li>• Open circuit between line pressure control solenoid terminal A and TCM terminal 1E</li><li>• Short to ground in wiring harness between line pressure control solenoid terminal B and TCM terminal 1R</li><li>• Short to ground in wiring harness between line pressure control solenoid terminal A and TCM terminal 1E</li><li>• Line pressure control solenoid malfunction</li><li>• Damaged connector between line pressure control solenoid and TCM</li><li>• TCM malfunction</li></ul>

**AUTOMATIC TRANSMISSION  
WIRING HARNESS-SIDE CONNECTOR  
(COUPLE COMPONENT)**

O	M	K	I	G	E	C	A
N	L	J	H	F	D	B	

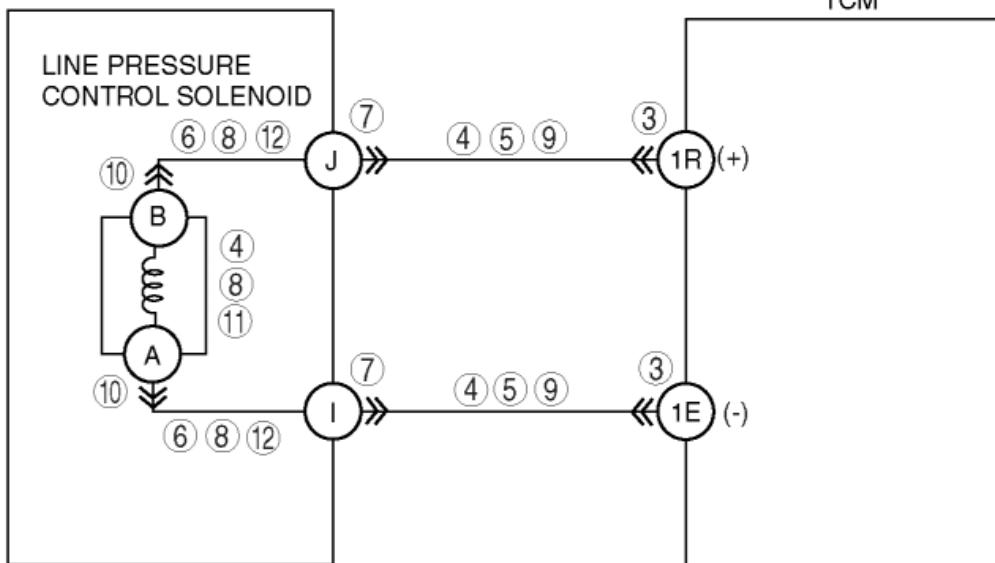


**LINE PRESSURE  
CONTROL SOLENOID  
WIRING HARNESS-SIDE  
CONNECTOR**

B	A
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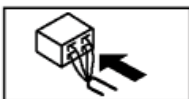


**AUTOMATIC TRANSMISSION  
(COUPLE COMPONENT)**

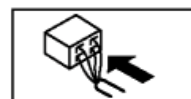


**TCM WIRING HARNESS-SIDE CONNECTOR**

1AF	1AA	1Y	1R	1P	1H	1D
1AG	1AC	1AB	1Z	1V	1S	1Q
1AH	1AD	1W	1T	1M	1J	1F
1AI	1AE	1X	1U	1N	1K	1G



2AF	2AB	2R	2O	2J	2F
2AG	2AC	2Y	2V	2S	2P
2AH	2AD	2Z	2W	2T	2Q
2AI	2AE	2AA	2X	2U	2I



**Diagnostic procedure**

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Record the FREEZE FRAME DATA on the repair order, then go to the next step.</p>
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	<p>Yes Perform repair or diagnosis according to the available repair information.</p> <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> <p>No Go to the next step.</p>
3	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the TCM connector.</li> </ul>	<p>Yes Go to the next step.</p> <p>No Repair or replace the connector and/or</p>

	<ul style="list-style-type: none"> <li>Inspect for poor connection at TCM terminals 1R and 1E (such as damaged/pulled-out pins, corrosion).</li> <li>Are terminals normal?</li> </ul>	terminal, then go to Step 13.
4	<b>INSPECT RESISTANCE OF LINE PRESSURE CONTROL SOLENOID CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for resistance between TCM terminals 1R and 1E (wiring harness-side).</li> <li>Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> </ul>	Yes Go to the next step.
		No Go to go to Step 7.
5	<b>INSPECT LINE PRESSURE CONTROL SOLENOID CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>Disconnect the couple component connector.</li> <li>Inspect for continuity between TCM terminals (wiring harness-side) and body ground. <ul style="list-style-type: none"> <li>Terminal 1R and body ground</li> <li>Terminal 1E and body ground</li> </ul> </li> <li>Is there continuity?</li> </ul>	Yes Go to the next step.
		No Repair or replace the wiring harness for short to ground, then go to Step 13.
6	<b>INSPECT LINE PRESSURE CONTROL SOLENOID CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>Inspect for continuity between couple component terminals (wiring harness-side) and body ground. <ul style="list-style-type: none"> <li>Terminal J and body ground</li> <li>Terminal I and body ground</li> </ul> </li> <li>Is there continuity?</li> </ul>	Yes Go to go to Step 13.
		No Repair or replace the couple component, then go to the next step.
7	<b>INSPECT COUPLE COMPONENT CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the couple component connector.</li> <li>Inspect for poor connection at couple component terminals J and I (such as damaged/pulled-out pins, corrosion).</li> <li>Are terminals normal?</li> </ul>	Yes Go to the next step.
		No Repair or replace the connector and/or terminal, then go to Step 13.
8	<b>INSPECT RESISTANCE OF LINE PRESSURE CONTROL SOLENOID CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect the resistance between couple component (transmission case side) terminals J and I.</li> <li>Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> </ul>	Yes Go to the next step.
		No Go to Step 10.
9	<b>INSPECT LINE PRESSURE CONTROL SOLENOID CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for continuity between TCM terminals and couple component terminals (wiring harness-side). <ul style="list-style-type: none"> <li>Terminal 1R and terminal J</li> <li>Terminal 1E and terminal I</li> </ul> </li> <li>Is there continuity?</li> </ul>	Yes Go to Step 13.
		No Repair or replace the wiring harness for open circuit, go to Step 13.
10	<b>INSPECT LINE PRESSURE CONTROL SOLENOID CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Disconnect the line pressure control solenoid connector.</li> <li>Inspect for poor connection at line pressure control solenoid</li> </ul>	Yes Go to the next step.
		No Repair or replace the connector and/or terminal, then go to Step 13.

	<p>terminals A and B (such as damaged/pulled-out pins, corrosion).</p> <ul style="list-style-type: none"> <li>Are terminals normal?</li> </ul>		
11	<b>INSPECT LINE PRESSURE CONTROL SOLENOID</b> <ul style="list-style-type: none"> <li>Inspect the line pressure control solenoid. (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> <li>Is the line pressure control solenoid normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the control valve body, then go to Step 13.  (See <a href="#">CONTROL VALVE BODY REMOVAL [SJ6A-EL]</a> .)  (See <a href="#">CONTROL VALVE BODY INSTALLATION [SJ6A-EL]</a> .)
12	<b>INSPECT LINE PRESSURE CONTROL SOLENOID CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for continuity between couple component terminals and line pressure control solenoid terminals (wiring harness-side).               <ul style="list-style-type: none"> <li>Terminal J and terminal B</li> <li>Terminal I and terminal A</li> </ul> </li> <li>Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the couple component, then go to the next step.
13	<b>VERIFY TROUBLESHOOTING OF DTC P0962 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all the disconnected connectors.</li> <li>Clear the DTC from the memory using the M-MDS.</li> <li>Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li> <li>Is same DTC present?</li> </ul>	Yes	Replace the TCM, then go to the next step.  (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL]</a> .)
		No	Go to the next step.
14	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the "After Repair Procedure". (See <a href="#">AFTER REPAIR PROCEDURE [SJ6A-EL]</a>.)</li> <li>Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection.  (See <a href="#">DTC TABLE [SJ6A-EL]</a> .)
		No	Troubleshooting completed.

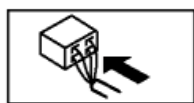
2008 - MX-5 - Transmission/Transaxle

DTC P0963 [SJ6A-EL]

DTC P0963	Line pressure control solenoid circuit malfunction (short to power)
DETECTION CONDITION	<ul style="list-style-type: none"><li>Short circuit in line pressure control solenoid signal system (while TCM monitors solenoid output voltage, the voltage that differs from the signal output by CPU in TCM is detected).</li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>The MIL illuminates if the TCM detects the above malfunction condition during the first drive cycle.</li><li>A PENDING CODE is not available.</li><li>FREEZE FRAME DATA is available.</li><li>The AT warning light illuminates.</li><li>The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Short to power in wiring harness between line pressure control solenoid terminal B and TCM terminal 1R</li><li>Short to power in wiring harness between line pressure control solenoid terminal A and TCM terminal 1E</li><li>Line pressure control solenoid malfunction</li><li>Damaged connector between line pressure control solenoid and TCM</li><li>TCM malfunction</li></ul>

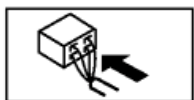
# **AUTOMATIC TRANSMISSION WIRING HARNESS-SIDE CONNECTOR (COUPLE COMPONENT)**

O	M	K	I	G	E	C	A
N	L	J	H	F	D	B	

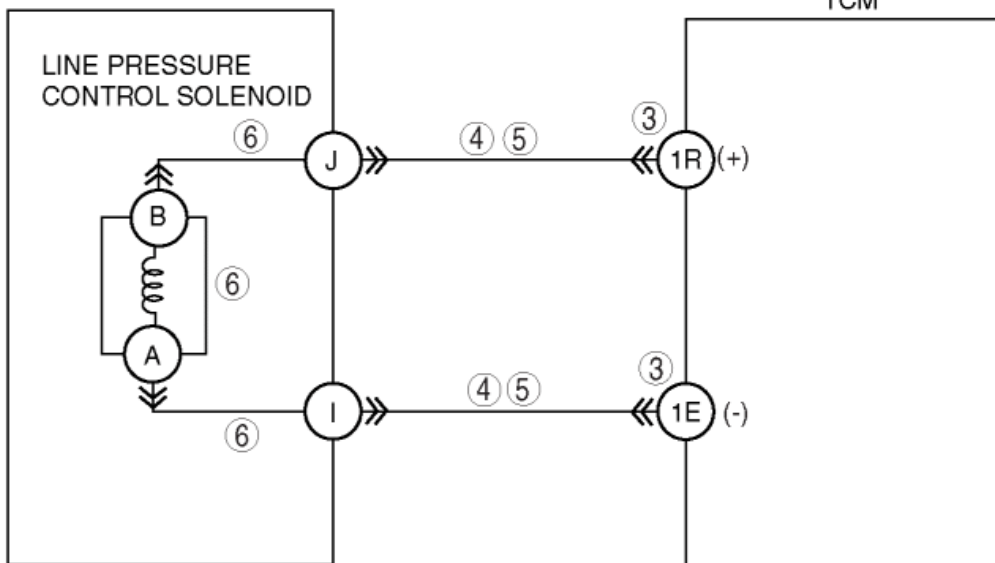


## **LINE PRESSURE CONTROL SOLENOID WIRING HARNESS-SIDE CONNECTOR**

B	A
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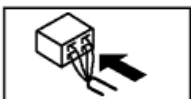


# **AUTOMATIC TRANSMISSION (COUPLE COMPONENT)**

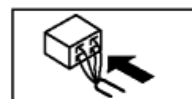


## **TCM WIRING HARNESS-SIDE CONNECTOR**

1AF	1AA	1Y	1R	1P	1H	1D
1AG	1AC	1AB	1Z	1V	1S	1Q
1AH	1AD	1W	1T	1M	1J	1F
1AI	1AE	1X	1U	1N	1K	1G



2AF	2AB	2R	2O	2J	2F
2AG	2AC	2S	2P	2M	2K
2AH	2AD	2Z	2W	2T	2Q
2AI	2AE	2AA	2X	2U	2I



## **Diagnostic procedure**

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Record the FREEZE FRAME DATA on the repair order, then go to the next step.</p>
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	<p>Yes Perform repair or diagnosis according to the available repair information.</p> <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> <p>No Go to the next step.</p>
3	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the TCM connector.</li> </ul>	<p>Yes Go to the next step.</p> <p>No Repair or replace the connector and/or terminal, then go to Step 7.</p>



	<ul style="list-style-type: none"> <li>Inspect for poor connection at TCM terminals 1R and 1E (such as damaged/pulled-out pins, corrosion).</li> <li>Are terminals normal?</li> </ul>		
4	<b>INSPECT LINE PRESSURE CONTROL SOLENOID CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (engine off).</li> <li>Measure the voltage at TCM (wiring harness-side) terminals 1R and 1E.</li> <li>Is there <b>0 V</b> at the TCM wiring harness-side connector terminals?</li> </ul>	Yes	Go to go to Step 7.
		No	Go to the next step.
5	<b>INSPECT LINE PRESSURE CONTROL SOLENOID CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the couple component connector.</li> <li>Turn the ignition switch to the ON position (engine off).</li> <li>Measure the voltage at TCM (wiring harness-side) terminals 1R and 1E.</li> <li>Is there <b>0 V</b> at the TCM wiring harness-side connector terminals?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness (TCM—couple component connector) for short to power supply, then go to Step 7.
6	<b>INSPECT LINE PRESSURE CONTROL SOLENOID</b> <ul style="list-style-type: none"> <li>Inspect the line pressure control solenoid.</li> </ul> <p>(See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</p> <ul style="list-style-type: none"> <li>Is the line pressure control solenoid normal?</li> </ul>	Yes	Repair or replace the wiring harness (couple component connector—line pressure control solenoid) for short to power supply, then go to the next step.
		No	Replace the control valve body, then go to the next step. (See <a href="#">CONTROL VALVE BODY REMOVAL [SJ6A-EL]</a> .) (See <a href="#">CONTROL VALVE BODY INSTALLATION [SJ6A-EL]</a> .)
7	<b>VERIFY TROUBLESHOOTING OF DTC P0963 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all the disconnected connectors.</li> <li>Clear the DTC from the memory using the M-MDS.</li> <li>Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li> <li>Is same DTC present?</li> </ul>	Yes	Replace the TCM, then go to the next step. (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL]</a> .)
		No	Go to the next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the “After Repair Procedure”.</li> </ul> <p>(See <a href="#">AFTER REPAIR PROCEDURE [SJ6A-EL]</a>.)</p> <ul style="list-style-type: none"> <li>Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [SJ6A-EL]</a> .)
		No	Troubleshooting completed.

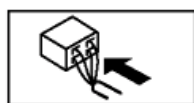
2008 - MX-5 - Transmission/Transaxle

DTC P0973 [SJ6A-EL]

DTC P0973	Shift solenoid A circuit malfunction (short to ground)
DETECTION CONDITION	<ul style="list-style-type: none"><li>• Short to ground in shift solenoid A signal system (while TCM monitors solenoid output voltage, the voltage that differs from the signal output by CPU in TCM is detected).</li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>• The MIL illuminates if the TCM detects the above malfunction condition during first drive cycle.</li><li>• A PENDING CODE is not available.</li><li>• FREEZE FRAME DATA is available.</li><li>• The AT warning light illuminates.</li><li>• The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Short to ground in wiring harness between shift solenoid A terminal A and TCM terminal 1AF</li><li>• Shift solenoid A malfunction</li><li>• Damaged connector between shift solenoid A and TCM</li><li>• TCM malfunction</li></ul>

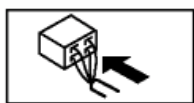
**AUTOMATIC TRANSMISSION  
WIRING HARNESS-SIDE CONNECTOR  
(COUPLE COMPONENT)**

O	M	K	I	G	E	C	A
N	L	J	H	F	D	B	

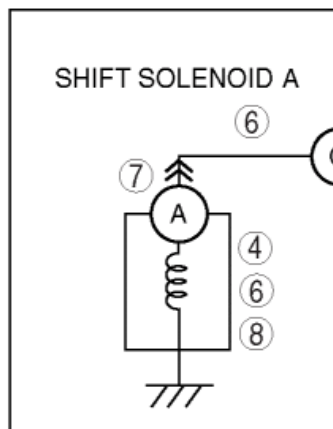


**SHIFT SOLENOID A WIRING  
HARNESS-SIDE CONNECTOR**

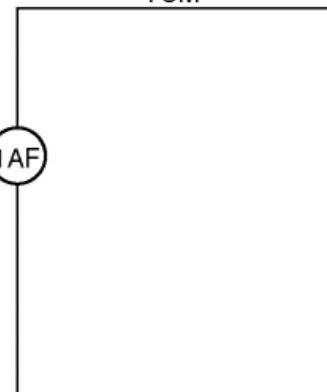
	A
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**AUTOMATIC TRANSMISSION  
(COUPLE COMPONENT)**

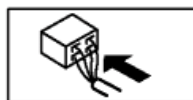


**TCM**

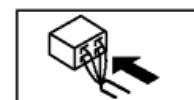


**TCM WIRING HARNESS-SIDE CONNECTOR**

<div></div>											
	1AF	1AA	1Y	1R	1P		1H	1D			
1AG	1AC	1AB	1Z	1V	1S	1Q	1O	1L	1I	1E	1A
1AH	1AD			1W	1T			1M	1J	1F	1B
1AI	1AE			1X	1U			1N	1K	1G	1C



<div></div>													
2AF		2AB			2R		2O		2J		2F		
2AG	2AC	2Y	2V	2S	2P	2M	2K	2G	2C				
2AH	2AD	2Z	2W	2T	2Q	2N	2L	2H	2D	2A			
2AI	2AE	2AA	2X	2U				2I	2E	2B			



**Diagnostic procedure**

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.  No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> No Go to the next step.
3	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the TCM connector.</li> <li>Inspect for poor connection at TCM terminal 1AF (such as damaged/pulled-out pins, corrosion).</li> </ul>	Yes Go to the next step.  No Repair or replace the connector and/or terminal, then go to Step 9.

	<ul style="list-style-type: none"> <li>Is terminal normal?</li> </ul>		
4	<b>INSPECT RESISTANCE OF SHIFT SOLENOID A CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for resistance between TCM terminal 1AF (wiring harness-side) and body ground.</li> <li>Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to Step 9.
		No	Go to the next step.
5	<b>INSPECT COUPLE COMPONENT CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the couple component connector.</li> <li>Inspect for poor connection at couple component terminal O (such as damaged/pulled-out pins, corrosion).</li> <li>Is terminal normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 9.
6	<b>INSPECT RESISTANCE OF SHIFT SOLENOID A CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect the resistance between couple component (transmission case side) terminal O and body ground.</li> <li>Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to the next step.
		No	Go to Step 9.
7	<b>INSPECT SHIFT SOLENOID A CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the shift solenoid A connector.</li> <li>Inspect for poor connection at shift solenoid A terminal A (such as damaged/pulled-out pins, corrosion).</li> <li>Is terminal normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 9.
8	<b>INSPECT SHIFT SOLENOID A</b> <ul style="list-style-type: none"> <li>Inspect the shift solenoid A. (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> <li>Is the shift solenoid A normal?</li> </ul>	Yes	Repair or replace the wiring harness (couple component connector—shift solenoid A) for short to ground, then go to the next step.
		No	Replace the control valve body, then go to the next step. (See <a href="#">CONTROL VALVE BODY REMOVAL [SJ6A-EL]</a> .) (See <a href="#">CONTROL VALVE BODY INSTALLATION [SJ6A-EL]</a> .)
9	<b>VERIFY TROUBLESHOOTING OF DTC P0973 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all the disconnected connectors.</li> <li>Clear the DTC from the memory using the M-MDS.</li> <li>Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li> <li>Is same DTC present?</li> </ul>	Yes	Replace the TCM, then go to the next step. (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL]</a> .)
		No	Go to the next step.
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the “After Repair Procedure”. (See <a href="#">AFTER REPAIR PROCEDURE [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [SJ6A-EL]</a> .)

	• Are any DTCs present?	No	Troubleshooting completed.
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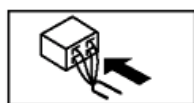
2008 - MX-5 - Transmission/Transaxle

DTC P0974 [SJ6A-EL]

DTC P0974	Shift solenoid A circuit malfunction (short to power/open circuit)
DETECTION CONDITION	<ul style="list-style-type: none"><li>• Open or short circuit in shift solenoid A signal system (while TCM monitors solenoid output voltage, the voltage that differs from the signal output by CPU in TCM is detected).</li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>• The MIL illuminates if the TCM detects the above malfunction condition during first drive cycle.</li><li>• A PENDING CODE is not available.</li><li>• FREEZE FRAME DATA is available.</li><li>• The AT warning light illuminates.</li><li>• The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Open circuit in wiring harness between shift solenoid A terminal A and TCM terminal 1AF</li><li>• Short to power in wiring harness between shift solenoid A terminal A and TCM terminal 1AF</li><li>• Shift solenoid A malfunction</li><li>• Damaged connector between shift solenoid A and TCM</li><li>• TCM malfunction</li></ul>

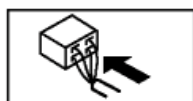
**AUTOMATIC TRANSMISSION  
WIRING HARNESS-SIDE CONNECTOR  
(COUPLE COMPONENT)**

O	M	K	I	G	E	C	A
N	L	J	H	F	D	B	

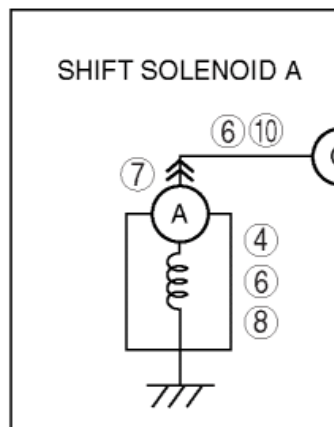


**SHIFT SOLENOID A WIRING  
HARNESS-SIDE CONNECTOR**

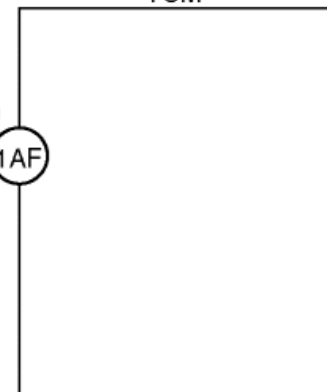
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**AUTOMATIC TRANSMISSION  
(COUPLE COMPONENT)**

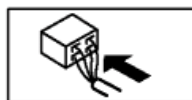


**TCM**

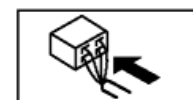


**TCM WIRING HARNESS-SIDE CONNECTOR**

<div></div>											
	1AF	1AA	1Y	1R	1P			1H	1D		
1AG	1AC	1AB	1Z	1V	1S	1Q	1O	1L	1I	1E	1A
1AH	1AD			1W	1T			1M	1J	1F	1B
1AI	1AE			1X	1U			1N	1K	1G	1C



<div></div>													
2AF		2AB			2R		2O		2J		2F		
2AG	2AC	2Y	2V	2S	2P	2M	2K	2G	2C				
2AH	2AD	2Z	2W	2T	2Q	2N	2L	2H	2D	2A			
2AI	2AE	2AA	2X	2U				2I	2E	2B			



**Diagnostic procedure**

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.  No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> No Go to the next step.
3	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the TCM connector.</li> <li>Inspect for poor connection at TCM terminal 1AF (such as damaged/pulled-out pins, corrosion).</li> </ul>	Yes Go to the next step.  No Repair or replace the connector and/or terminal, then go to Step 11.

	<ul style="list-style-type: none"> <li>Is terminal normal?</li> </ul>		
4	<b>INSPECT RESISTANCE OF SHIFT SOLENOID A CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for resistance between TCM terminal 1AF (wiring harness-side) and body ground.</li> <li>Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to Step 9.
		No	Go to the next step.
5	<b>INSPECT COUPLE COMPONENT CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the couple component connector.</li> <li>Inspect for poor connection at couple component terminal O (such as damaged/pulled-out pins, corrosion).</li> <li>Is terminal normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 11.
6	<b>INSPECT RESISTANCE OF SHIFT SOLENOID A CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect the resistance between couple component (transmission case side) terminal O and body ground.</li> <li>Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to Step 11.
		No	Go to the next step.
7	<b>INSPECT SHIFT SOLENOID A CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the shift solenoid A connector.</li> <li>Inspect for poor connection at shift solenoid A terminal A (such as damaged/pulled-out pins, corrosion).</li> <li>Is terminal normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 11.
8	<b>INSPECT SHIFT SOLENOID A</b> <ul style="list-style-type: none"> <li>Inspect the shift solenoid A. (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> <li>Is the shift solenoid A normal?</li> </ul>	Yes	Repair or replace the wiring harness (couple component—shift solenoid A) for short to ground, then go to Step 11.
		No	Replace the control valve body, then go to Step 11. (See <a href="#">CONTROL VALVE BODY REMOVAL [SJ6A-EL]</a> .) (See <a href="#">CONTROL VALVE BODY INSTALLATION [SJ6A-EL]</a> .)
9	<b>INSPECT SHIFT SOLENOID A CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (engine off).</li> <li>Measure the voltage at TCM (wiring harness-side) terminal 1AF.</li> <li>Is there <b>0 V</b> at the TCM wiring harness-side connector terminals?</li> </ul>	Yes	Go to Step 11.
		No	Go to the next step.
10	<b>INSPECT SHIFT SOLENOID A CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the couple component connector.</li> <li>Turn the ignition switch to the ON position (engine off).</li> </ul>	Yes	Repair or replace the wiring harness (TCM—couple component) for short to power supply, then go to the next step.
		No	Repair or replace the wiring harness (couple component—shift solenoid A) for short to power supply, then go to the next step.



	<ul style="list-style-type: none"> <li>• Measure the voltage at couple component (wiring harness-side) terminal O.</li> <li>• Is there <b>0 V</b> at the TCM wiring harness-side connector terminals?</li> </ul>		
11	<b>VERIFY TROUBLESHOOTING OF DTC P0974 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all the disconnected connectors.</li> <li>• Clear the DTC from the memory using the M-MDS.</li> <li>• Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li> <li>• Is same DTC present?</li> </ul>	Yes	Replace the TCM, then go to the next step. (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL]</a> .)
		No	Go to the next step.
12	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform the "After Repair Procedure".                (See <a href="#">AFTER REPAIR PROCEDURE [SJ6A-EL]</a>.)</li> <li>• Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [SJ6A-EL]</a> .)
		No	Troubleshooting completed.

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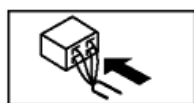
2008 - MX-5 - Transmission/Transaxle

DTC P0976 [SJ6A-EL]

DTC P0976	Shift solenoid B circuit malfunction (short to ground)
DETECTION CONDITION	<ul style="list-style-type: none"><li>• Short to ground in shift solenoid B signal system (while TCM monitors solenoid output voltage, the voltage that differs from the signal output by CPU in TCM is detected).</li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>• The MIL illuminates if the TCM detects the above malfunction condition during first drive cycle.</li><li>• A PENDING CODE is not available.</li><li>• FREEZE FRAME DATA is available.</li><li>• The AT warning light illuminates.</li><li>• The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Short to ground in wiring harness between shift solenoid B terminal A and TCM terminal 1AB</li><li>• Shift solenoid B malfunction</li><li>• Damaged connector between shift solenoid B and TCM</li><li>• TCM malfunction</li></ul>

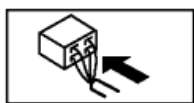
# AUTOMATIC TRANSMISSION WIRING HARNESS-SIDE CONNECTOR (COUPLE COMPONENT)

O	M	K	I	G	E	C	A
N	L	J	H	F	D	B	

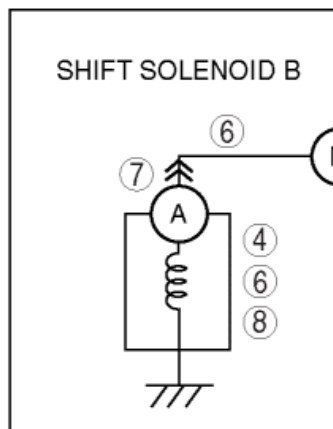


## SHIFT SOLENOID B WIRING HARNESS-SIDE CONNECTOR

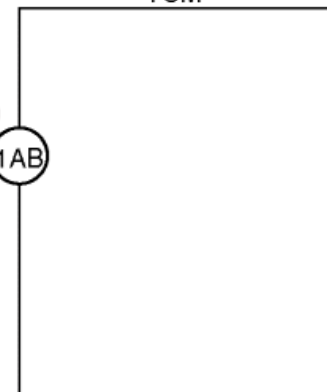
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# AUTOMATIC TRANSMISSION (COUPLE COMPONENT)

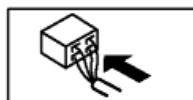



## TCM

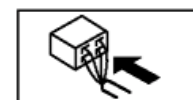


## TCM WIRING HARNESS-SIDE CONNECTOR

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	1AF	1AA		1Y	1R		1P		1H		1D
1AG	1AC	1AB	1Z	1V	1S	1Q	1O	1L	1I	1E	1A
1AH	1AD			1W	1T			1M	1J	1F	1B
1AI	1AE			1X	1U			1N	1K	1G	1C



															
2AF		2AB				2R		2O		2J		2F			
2AG	2AC	2Y	2V	2S	2P	2M	2K	2G	2C						
2AH	2AD	2Z	2W	2T	2Q	2N	2L	2H	2D	2A					
2AI	2AE	2AA	2X	2U					2I	2E	2B				



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step. No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> No Go to the next step.
3	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the TCM connector.</li> <li>Inspect for poor connection at TCM terminal 1AB (such as damaged/pulled-out pins, corrosion).</li> </ul>	Yes Go to the next step. No Repair or replace the connector and/or terminal, then go to Step 9.

	<ul style="list-style-type: none"> <li>Is terminal normal?</li> </ul>		
4	<b>INSPECT RESISTANCE OF SHIFT SOLENOID B CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for resistance between TCM terminal 1AB (wiring harness-side) and body ground.</li> <li>Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to Step 9.
		No	Go to the next step.
5	<b>INSPECT COUPLE COMPONENT CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the couple component connector.</li> <li>Inspect for poor connection at couple component terminal N (such as damaged/pulled-out pins, corrosion).</li> <li>Is terminal normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 9.
6	<b>INSPECT RESISTANCE OF SHIFT SOLENOID B CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect the resistance between couple component (transmission case side) terminal N and body ground.</li> <li>Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to the next step.
		No	Go to Step 9.
7	<b>INSPECT SHIFT SOLENOID B CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the shift solenoid B connector.</li> <li>Inspect for poor connection at shift solenoid B terminal A (such as damaged/pulled-out pins, corrosion).</li> <li>Is terminal normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 9.
8	<b>INSPECT SHIFT SOLENOID B</b> <ul style="list-style-type: none"> <li>Inspect the shift solenoid B. (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> <li>Is the shift solenoid B normal?</li> </ul>	Yes	Repair or replace the wiring harness (couple component connector—shift solenoid B) for short to ground, then go to the next step.
		No	Replace the control valve body, then go to the next step. (See <a href="#">CONTROL VALVE BODY REMOVAL [SJ6A-EL]</a> .) (See <a href="#">CONTROL VALVE BODY INSTALLATION [SJ6A-EL]</a> .)
9	<b>VERIFY TROUBLESHOOTING OF DTC P0976 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all the disconnected connectors.</li> <li>Clear the DTC from the memory using the M-MDS.</li> <li>Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li> <li>Is same DTC present?</li> </ul>	Yes	Replace the TCM, then go to the next step. (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL]</a> .)
		No	Go to the next step.
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the "After Repair Procedure". (See <a href="#">AFTER REPAIR PROCEDURE [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [SJ6A-EL]</a> .)

	• Are any DTCs present?	No	Troubleshooting completed.
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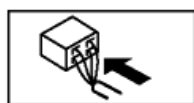
2008 - MX-5 - Transmission/Transaxle

DTC P0977 [SJ6A-EL]

DTC P0977	Shift solenoid B circuit malfunction (short to power/open circuit)
DETECTION CONDITION	<ul style="list-style-type: none"><li>• Open or short circuit in shift solenoid B signal system (while TCM monitors solenoid output voltage, the voltage that differs from the signal output by CPU in TCM is detected).</li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>• The MIL illuminates if the TCM detects the above malfunction condition during first drive cycle.</li><li>• A PENDING CODE is not available.</li><li>• FREEZE FRAME DATA is available.</li><li>• The AT warning light illuminates.</li><li>• The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Open circuit in wiring harness between shift solenoid B terminal A and TCM terminal 1AB</li><li>• Short to power in wiring harness between shift solenoid B terminal A and TCM terminal 1AB</li><li>• Shift solenoid B malfunction</li><li>• Damaged connector between shift solenoid B and TCM</li><li>• TCM malfunction</li></ul>

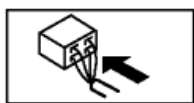
**AUTOMATIC TRANSMISSION  
WIRING HARNESS-SIDE CONNECTOR  
(COUPLE COMPONENT)**

O	M	K	I	G	E	C	A
N	L	J	H	F	D	B	

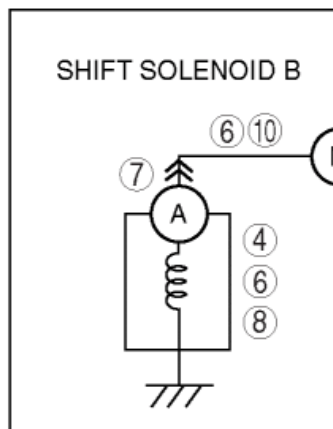


**SHIFT SOLENOID B WIRING  
HARNESS-SIDE CONNECTOR**

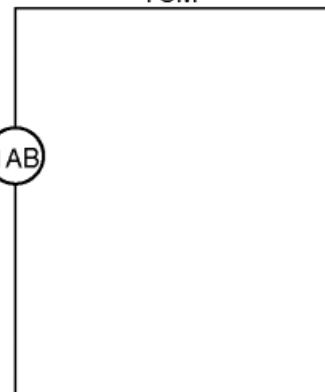
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**AUTOMATIC TRANSMISSION  
(COUPLE COMPONENT)**

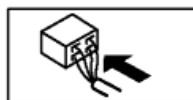


**TCM**

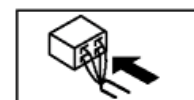


**TCM WIRING HARNESS-SIDE CONNECTOR**

<div></div>											
	1AF	1AA	1Y	1R	1P		1H	1D			
1AG	1AC	1AB	1Z	1V	1S	1Q	1O	1L	1I	1E	1A
1AH	1AD			1W	1T			1M	1J	1F	1B
1AI	1AE			1X	1U			1N	1K	1G	1C



<div></div>													
2AF		2AB			2R		2O		2J		2F		
2AG	2AC	2Y	2V	2S	2P	2M	2K	2G	2C				
2AH	2AD	2Z	2W	2T	2Q	2N	2L	2H	2D	2A			
2AI	2AE	2AA	2X	2U				2I	2E	2B			



**Diagnostic procedure**

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.  No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> No Go to the next step.
3	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the TCM connector.</li> <li>Inspect for poor connection at TCM terminal 1AB (such as damaged/pulled-out pins, corrosion).</li> </ul>	Yes Go to the next step.  No Repair or replace the connector and/or terminal, then go to Step 11.

	<ul style="list-style-type: none"> <li>Is terminal normal?</li> </ul>		
4	<b>INSPECT RESISTANCE OF SHIFT SOLENOID B CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for resistance between TCM terminal 1AB (wiring harness-side) and body ground.</li> <li>Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL].</a>)</li> </ul>	Yes	Go to Step 9.
		No	Go to the next step.
5	<b>INSPECT COUPLE COMPONENT CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the couple component connector.</li> <li>Inspect for poor connection at couple component terminal N (such as damaged/pulled-out pins, corrosion).</li> <li>Is terminal normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 11.
6	<b>INSPECT RESISTANCE OF SHIFT SOLENOID B CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect the resistance between couple component (transmission case side) terminal N and body ground.</li> <li>Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL].</a>)</li> </ul>	Yes	Go to Step 11.
		No	Go to the next step.
7	<b>INSPECT SHIFT SOLENOID B CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the shift solenoid B connector.</li> <li>Inspect for poor connection at shift solenoid B terminal A (such as damaged/pulled-out pins, corrosion).</li> <li>Is terminal normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 11.
8	<b>INSPECT SHIFT SOLENOID B</b> <ul style="list-style-type: none"> <li>Inspect the shift solenoid B. (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL].</a>)</li> <li>Is the shift solenoid B normal?</li> </ul>	Yes	Repair or replace the wiring harness (couple component—shift solenoid B) for short to ground, then go to Step 11.
		No	Replace the control valve body, then go to Step 11. (See <a href="#">CONTROL VALVE BODY REMOVAL [SJ6A-EL].</a> ) (See <a href="#">CONTROL VALVE BODY INSTALLATION [SJ6A-EL].</a> )
9	<b>INSPECT SHIFT SOLENOID B CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (engine off).</li> <li>Measure the voltage at TCM (wiring harness-side) terminal 1AB.</li> <li>Is there <b>0 V</b> at the TCM wiring harness-side connector terminals?</li> </ul>	Yes	Go to Step 11.
		No	Go to the next step.
10	<b>INSPECT SHIFT SOLENOID B CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the couple component connector.</li> <li>Turn the ignition switch to the ON position (engine off).</li> </ul>	Yes	Repair or replace the wiring harness (TCM—couple component) for short to power supply, then go to the next step.
		No	Repair or replace the wiring harness (couple component—shift solenoid B) for short to power supply, then go to the next step.



	<ul style="list-style-type: none"> <li>• Measure the voltage at couple component (wiring harness-side) terminal N.</li> <li>• Is there <b>0 V</b> at the TCM wiring harness-side connector terminals?</li> </ul>		
11	<b>VERIFY TROUBLESHOOTING OF DTC P0977 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all the disconnected connectors.</li> <li>• Clear the DTC from the memory using the M-MDS.</li> <li>• Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li> <li>• Is same DTC present?</li> </ul>	Yes Replace the TCM, then go to the next step. (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL]</a> .)	
		No Go to the next step.	
12	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform the "After Repair Procedure". (See <a href="#">AFTER REPAIR PROCEDURE [SJ6A-EL]</a>.)</li> <li>• Are any DTCs present?</li> </ul>	Yes Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [SJ6A-EL]</a> .)	
		No Troubleshooting completed.	

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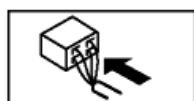
2008 - MX-5 - Transmission/Transaxle

DTC P0979 [SJ6A-EL]

DTC P0979	Shift solenoid C circuit malfunction (short to ground)
DETECTION CONDITION	<ul style="list-style-type: none"><li>• Short to ground in shift solenoid C signal system (while TCM monitors solenoid output voltage, the voltage that differs from the signal output by CPU in TCM is detected).</li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>• The MIL illuminates if the TCM detects the above malfunction condition during first drive cycle.</li><li>• A PENDING CODE is not available.</li><li>• FREEZE FRAME DATA is available.</li><li>• The AT warning light illuminates.</li><li>• The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Short to ground in wiring harness between shift solenoid C terminal A and TCM terminal 1AA</li><li>• Shift solenoid C malfunction</li><li>• Damaged connector between shift solenoid C and TCM</li><li>• TCM malfunction</li></ul>

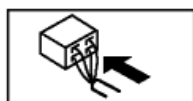
# AUTOMATIC TRANSMISSION WIRING HARNESS-SIDE CONNECTOR (COUPLE COMPONENT)

O	M	K	I	G	E	C	A
N	L	J	H	F	D	B	

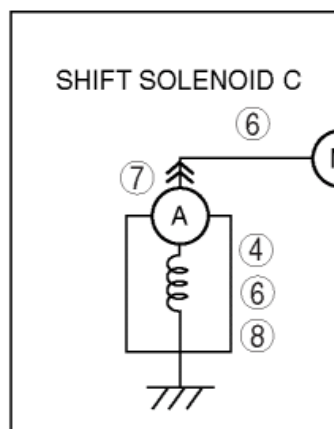


## SHIFT SOLENOID C WIRING HARNESS-SIDE CONNECTOR

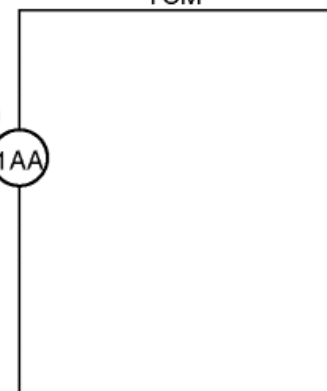
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# AUTOMATIC TRANSMISSION (COUPLE COMPONENT)

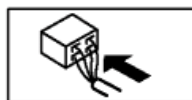


## TCM

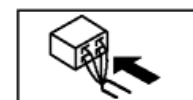


## TCM WIRING HARNESS-SIDE CONNECTOR

	1AF	1AA	1Y	1R	1P		1H	1D
1AG	1AC	1AB	1Z	1V	1S	1Q	1O	1L
1AH	1AD		1W	1T		1M	1J	1F
1AI	1AE		1X	1U		1N	1K	1G



2AF	2AB		2R	2O	2J	2F	
2AG	2AC	2Y	2V	2S	2P	2M	2K
2AH	2AD	2Z	2W	2T	2Q	2N	2L
2AI	2AE	2AA	2X	2U		2I	2E



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step. No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> No Go to the next step.
3	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the TCM connector.</li> <li>Inspect for poor connection at TCM terminal 1AA(such as damaged/pulled-out pins, corrosion).</li> </ul>	Yes Go to the next step. No Repair or replace the connector and/or terminal, then go to Step 9.

	<ul style="list-style-type: none"> <li>Is terminal normal?</li> </ul>		
4	<b>INSPECT RESISTANCE OF SHIFT SOLENOID C CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for resistance between TCM terminal 1AA (wiring harness-side) and body ground.</li> <li>Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to Step 9.
		No	Go to the next step.
5	<b>INSPECT COUPLE COMPONENT CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the couple component connector.</li> <li>Inspect for poor connection at couple component terminal M (such as damaged/pulled-out pins, corrosion).</li> <li>Is terminal normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 9.
6	<b>INSPECT RESISTANCE OF SHIFT SOLENOID C CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect the resistance between couple component (transmission case side) terminal M and body ground.</li> <li>Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to the next step.
		No	Go to Step 9.
7	<b>INSPECT SHIFT SOLENOID C CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the shift solenoid C connector.</li> <li>Inspect for poor connection at shift solenoid C terminal A (such as damaged/pulled-out pins, corrosion).</li> <li>Is terminal normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 9.
8	<b>INSPECT SHIFT SOLENOID C</b> <ul style="list-style-type: none"> <li>Inspect the shift solenoid C. (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> <li>Is the shift solenoid C normal?</li> </ul>	Yes	Repair or replace the wiring harness (couple component connector—shift solenoid C) for short to ground, then go to the next step.
		No	Replace the control valve body, then go to the next step. (See <a href="#">CONTROL VALVE BODY REMOVAL [SJ6A-EL]</a> .) (See <a href="#">CONTROL VALVE BODY INSTALLATION [SJ6A-EL]</a> .)
9	<b>VERIFY TROUBLESHOOTING OF DTC P0979 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all the disconnected connectors.</li> <li>Clear the DTC from the memory using the M-MDS.</li> <li>Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li> <li>Is same DTC present?</li> </ul>	Yes	Replace the TCM, then go to the next step. (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL]</a> .)
		No	Go to the next step.
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the "After Repair Procedure". (See <a href="#">AFTER REPAIR PROCEDURE [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [SJ6A-EL]</a> .)

	• Are any DTCs present?	No	Troubleshooting completed.
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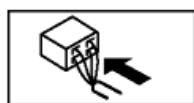
2008 - MX-5 - Transmission/Transaxle

DTC P0980 [SJ6A-EL]

DTC P0980	Shift solenoid C circuit malfunction (short to power/open circuit)
DETECTION CONDITION	<ul style="list-style-type: none"><li>• Open or short circuit in shift solenoid C signal system (while TCM monitors solenoid output voltage, the voltage that differs from the signal output by CPU in TCM is detected).</li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>• The MIL illuminates if the TCM detects the above malfunction condition during first drive cycle.</li><li>• A PENDING CODE is not available.</li><li>• FREEZE FRAME DATA is available.</li><li>• The AT warning light illuminates.</li><li>• The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Open circuit in wiring harness between shift solenoid C terminal A and TCM terminal 1AA</li><li>• Short to power in wiring harness between shift solenoid C terminal A and TCM terminal 1AA</li><li>• Shift solenoid C malfunction</li><li>• Damaged connector between shift solenoid C and TCM</li><li>• TCM malfunction</li></ul>

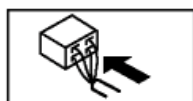
**AUTOMATIC TRANSMISSION  
WIRING HARNESS-SIDE CONNECTOR  
(COUPLE COMPONENT)**

O	M	K	I	G	E	C	A
N	L	J	H	F	D	B	

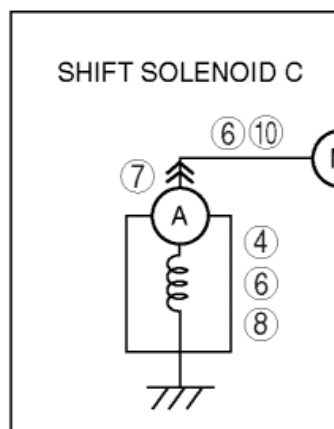


**SHIFT SOLENOID C WIRING  
HARNESS-SIDE CONNECTOR**

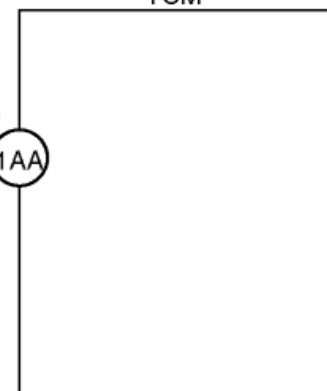
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**AUTOMATIC TRANSMISSION  
(COUPLE COMPONENT)**

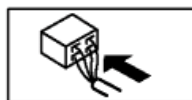


**TCM**

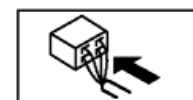


**TCM WIRING HARNESS-SIDE CONNECTOR**

<div></div>											
	1AF	1AA	1Y	1R	1P			1H	1D		
1AG	1AC	1AB	1Z	1V	1S	1Q	1O	1L	1I	1E	1A
1AH	1AD			1W	1T			1M	1J	1F	1B
1AI	1AE			1X	1U			1N	1K	1G	1C



<div></div>													
2AF		2AB			2R		2O		2J		2F		
2AG	2AC	2Y	2V	2S	2P	2M	2K	2G	2C				
2AH	2AD	2Z	2W	2T	2Q	2N	2L	2H	2D	2A			
2AI	2AE	2AA	2X	2U				2I	2E	2B			



**Diagnostic procedure**

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.  No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> No Go to the next step.
3	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the TCM connector.</li> <li>Inspect for poor connection at TCM terminal 1AA (such as damaged/pulled-out pins, corrosion).</li> </ul>	Yes Go to the next step.  No Repair or replace the connector and/or terminal, then go to Step 11.

	<ul style="list-style-type: none"> <li>Is terminal normal?</li> </ul>		
4	<b>INSPECT RESISTANCE OF SHIFT SOLENOID C CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for resistance between TCM terminal 1AA (wiring harness-side) and body ground.</li> <li>Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL].</a>)</li> </ul>	Yes	Go to Step 9.
		No	Go to the next step.
5	<b>INSPECT COUPLE COMPONENT CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the couple component connector.</li> <li>Inspect for poor connection at couple component terminal M (such as damaged/pulled-out pins, corrosion).</li> <li>Is terminal normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 11.
6	<b>INSPECT RESISTANCE OF SHIFT SOLENOID C CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect the resistance between couple component (transmission case side) terminal M and body ground.</li> <li>Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL].</a>)</li> </ul>	Yes	Go to Step 11.
		No	Go to the next step.
7	<b>INSPECT SHIFT SOLENOID C CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the shift solenoid C connector.</li> <li>Inspect for poor connection at shift solenoid C terminal A (such as damaged/pulled-out pins, corrosion).</li> <li>Is terminal normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 11.
8	<b>INSPECT SHIFT SOLENOID C</b> <ul style="list-style-type: none"> <li>Inspect the shift solenoid C. (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL].</a>)</li> <li>Is the shift solenoid C normal?</li> </ul>	Yes	Repair or replace the wiring harness (couple component—shift solenoid C) for short to ground, then go to Step 11.
		No	Replace the control valve body, then go to Step 11. (See <a href="#">CONTROL VALVE BODY REMOVAL [SJ6A-EL].</a> ) (See <a href="#">CONTROL VALVE BODY INSTALLATION [SJ6A-EL].</a> )
9	<b>INSPECT SHIFT SOLENOID C CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (engine off).</li> <li>Measure the voltage at TCM (wiring harness-side) terminal 1AA.</li> <li>Is there <b>0 V</b> at the TCM wiring harness-side connector terminals?</li> </ul>	Yes	Go to Step 11.
		No	Go to the next step.
10	<b>INSPECT SHIFT SOLENOID C CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the couple component connector.</li> <li>Turn the ignition switch to the ON position (engine off).</li> </ul>	Yes	Repair or replace the wiring harness (TCM—couple component) for short to power supply, then go to the next step.
		No	Repair or replace the wiring harness (couple component—shift solenoid C) for short to power supply, then go to the next step.



	<ul style="list-style-type: none"> <li>• Measure the voltage at couple component (wiring harness-side) terminal M.</li> <li>• Is there <b>0 V</b> at the TCM wiring harness-side connector terminals?</li> </ul>		
11	<b>VERIFY TROUBLESHOOTING OF DTC P0980 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all the disconnected connectors.</li> <li>• Clear the DTC from the memory using the M-MDS.</li> <li>• Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li> <li>• Is same DTC present?</li> </ul>	Yes	Replace the TCM, then go to the next step. (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL]</a> .)
		No	Go to the next step.
12	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform the "After Repair Procedure". (See <a href="#">AFTER REPAIR PROCEDURE [SJ6A-EL]</a>.)</li> <li>• Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [SJ6A-EL]</a> .)
		No	Troubleshooting completed.

[< Previous](#) [Next >](#)

[Back to Top](#)

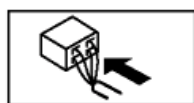
2008 - MX-5 - Transmission/Transaxle

DTC P0982 [SJ6A-EL]

DTC P0982	Shift solenoid D circuit malfunction (short to ground)
DETECTION CONDITION	<ul style="list-style-type: none"><li>• Short to ground in shift solenoid D signal system (while TCM monitors solenoid output voltage, the voltage that differs from the signal output by CPU in TCM is detected).</li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>• The MIL illuminates if the TCM detects the above malfunction condition during first drive cycle.</li><li>• A PENDING CODE is not available.</li><li>• FREEZE FRAME DATA is available.</li><li>• The AT warning light illuminates.</li><li>• The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Short to ground in wiring harness between shift solenoid D terminal A and TCM terminal 1S</li><li>• Shift solenoid D malfunction</li><li>• Damaged connector between shift solenoid D and TCM</li><li>• TCM malfunction</li></ul>

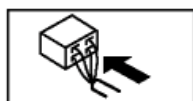
# AUTOMATIC TRANSMISSION WIRING HARNESS-SIDE CONNECTOR (COUPLE COMPONENT)

O	M	K	I	G	E	C	A
N	L	J	H	F	D	B	

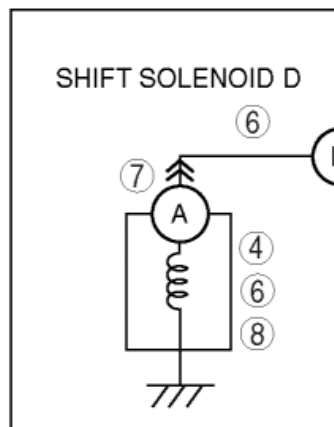


## SHIFT SOLENOID D WIRING HARNESS-SIDE CONNECTOR

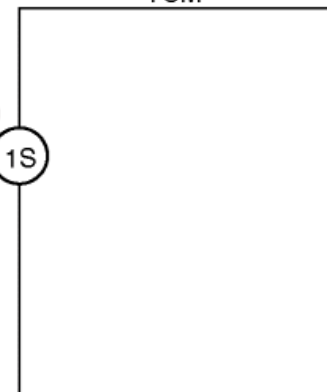
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# AUTOMATIC TRANSMISSION (COUPLE COMPONENT)

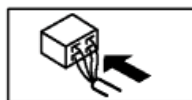


## TCM

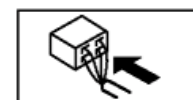


## TCM WIRING HARNESS-SIDE CONNECTOR

	1AF	1AA	1Y	1R	1P		1H	1D	
1AG	1AC	1AB	1Z	1V	1S	1Q	1O	1L	1I
1AH	1AD		1W	1T		1M	1J	1F	1B
1AI	1AE		1X	1U		1N	1K	1G	1C



2AF	2AB		2R	2O	2J	2F	
2AG	2AC	2Y	2V	2S	2P	2M	2K
2AH	2AD	2Z	2W	2T	2Q	2N	2L
2AI	2AE	2AA	2X	2U		2I	2E



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Record the FREEZE FRAME DATA on the repair order, then go to the next step.</p>
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	<p>Yes Perform repair or diagnosis according to the available repair information.</p> <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> <p>No Go to the next step.</p>
3	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the TCM connector.</li> <li>Inspect for poor connection at TCM terminal 1S (such as damaged/pulled-out pins, corrosion).</li> </ul>	<p>Yes Go to the next step.</p> <p>No Repair or replace the connector and/or terminal, then go to Step 9.</p>

	<ul style="list-style-type: none"> <li>Is terminal normal?</li> </ul>		
4	<b>INSPECT RESISTANCE OF SHIFT SOLENOID D CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for resistance between TCM terminal 1S (wiring harness-side) and body ground.</li> <li>Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to Step 9.
		No	Go to the next step.
5	<b>INSPECT COUPLE COMPONENT CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the couple component connector.</li> <li>Inspect for poor connection at couple component terminal L (such as damaged/pulled-out pins, corrosion).</li> <li>Is terminal normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 9.
6	<b>INSPECT RESISTANCE OF SHIFT SOLENOID D CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect the resistance between couple component (transmission case side) terminal L and body ground.</li> <li>Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to the next step.
		No	Go to Step 9.
7	<b>INSPECT SHIFT SOLENOID D CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the shift solenoid D connector.</li> <li>Inspect for poor connection at shift solenoid D terminal A (such as damaged/pulled-out pins, corrosion).</li> <li>Is terminal normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 9.
8	<b>INSPECT SHIFT SOLENOID D</b> <ul style="list-style-type: none"> <li>Inspect the shift solenoid D. (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> <li>Is the shift solenoid D normal?</li> </ul>	Yes	Repair or replace the wiring harness (couple component connector—shift solenoid D) for short to ground, then go to the next step.
		No	Replace the control valve body, then go to the next step. (See <a href="#">CONTROL VALVE BODY REMOVAL [SJ6A-EL]</a> .) (See <a href="#">CONTROL VALVE BODY INSTALLATION [SJ6A-EL]</a> .)
9	<b>VERIFY TROUBLESHOOTING OF DTC P0982 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all the disconnected connectors.</li> <li>Clear the DTC from the memory using the M-MDS.</li> <li>Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li> <li>Is same DTC present?</li> </ul>	Yes	Replace the TCM, then go to the next step. (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL]</a> .)
		No	Go to the next step.
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the "After Repair Procedure". (See <a href="#">AFTER REPAIR PROCEDURE [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [SJ6A-EL]</a> .)

	• Are any DTCs present?	No	Troubleshooting completed.
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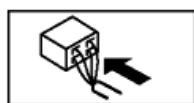
2008 - MX-5 - Transmission/Transaxle

DTC P0983 [SJ6A-EL]

DTC P0983	Shift solenoid D circuit malfunction (short to power/open circuit)
DETECTION CONDITION	<ul style="list-style-type: none"><li>• Open or short circuit in shift solenoid D signal system (while TCM monitors solenoid output voltage, the voltage that differs from the signal output by CPU in TCM is detected).</li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>• The MIL illuminates if the TCM detects the above malfunction condition during first drive cycle.</li><li>• A PENDING CODE is not available.</li><li>• FREEZE FRAME DATA is available.</li><li>• The AT warning light illuminates.</li><li>• The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Open circuit in wiring harness between shift solenoid D terminal A and TCM terminal 1S</li><li>• Short to power in wiring harness between shift solenoid D terminal A and TCM terminal 1S</li><li>• Shift solenoid D malfunction</li><li>• Damaged connector between shift solenoid D and TCM</li><li>• TCM malfunction</li></ul>

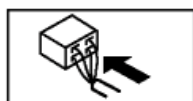
# AUTOMATIC TRANSMISSION WIRING HARNESS-SIDE CONNECTOR (COUPLE COMPONENT)

O	M	K	I	G	E	C	A
N	L	J	H	F	D	B	

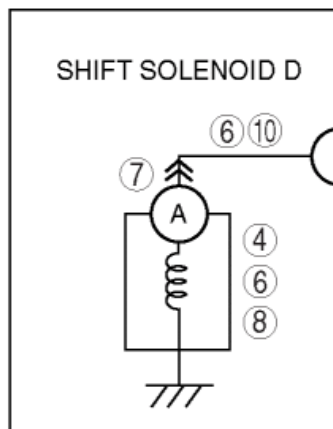


## SHIFT SOLENOID D WIRING HARNESS-SIDE CONNECTOR

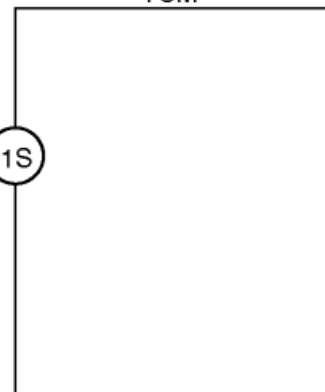
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# AUTOMATIC TRANSMISSION (COUPLE COMPONENT)

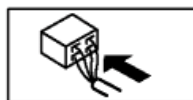


## TCM

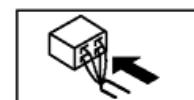


## TCM WIRING HARNESS-SIDE CONNECTOR

	1AF	1AA	1Y	1R	1P		1H	1D
1AG	1AC	1AB	1Z	1V	1S	1Q	1O	1L
1AH	1AD		1W	1T		1M	1J	1F
1AI	1AE		1X	1U		1N	1K	1G



2AF	2AB		2R	2O	2J	2F	
2AG	2AC	2Y	2V	2S	2P	2M	2K
2AH	2AD	2Z	2W	2T	2Q	2N	2L
2AI	2AE	2AA	2X	2U		2I	2E



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Record the FREEZE FRAME DATA on the repair order, then go to the next step.</p>
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	<p>Yes Perform repair or diagnosis according to the available repair information.</p> <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> <p>No Go to the next step.</p>
3	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the TCM connector.</li> <li>Inspect for poor connection at TCM terminal 1S (such as damaged/pulled-out pins, corrosion).</li> </ul>	<p>Yes Go to the next step.</p> <p>No Repair or replace the connector and/or terminal, then go to Step 11.</p>

	<ul style="list-style-type: none"> <li>Is terminal normal?</li> </ul>		
4	<b>INSPECT RESISTANCE OF SHIFT SOLENOID D CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for resistance between TCM terminal 1S (wiring harness-side) and body ground.</li> <li>Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to Step 9.
		No	Go to the next step.
5	<b>INSPECT COUPLE COMPONENT CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the couple component connector.</li> <li>Inspect for poor connection at couple component terminal L (such as damaged/pulled-out pins, corrosion).</li> <li>Is terminal normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 11.
6	<b>INSPECT RESISTANCE OF SHIFT SOLENOID D CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect the resistance between couple component (transmission case side) terminal L and body ground.</li> <li>Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to Step 11.
		No	Go to the next step.
7	<b>INSPECT SHIFT SOLENOID D CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the shift solenoid D connector.</li> <li>Inspect for poor connection at shift solenoid D terminal A (such as damaged/pulled-out pins, corrosion).</li> <li>Is terminal normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 11.
8	<b>INSPECT SHIFT SOLENOID D</b> <ul style="list-style-type: none"> <li>Inspect the shift solenoid D. (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> <li>Is the shift solenoid D normal?</li> </ul>	Yes	Repair or replace the wiring harness (couple component—shift solenoid D) for short to ground, then go to Step 11.
		No	Replace the control valve body, then go to Step 11. (See <a href="#">CONTROL VALVE BODY REMOVAL [SJ6A-EL]</a> .) (See <a href="#">CONTROL VALVE BODY INSTALLATION [SJ6A-EL]</a> .)
9	<b>INSPECT SHIFT SOLENOID D CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (engine off).</li> <li>Measure the voltage at TCM (wiring harness-side) terminal 1S.</li> <li>Is there <b>0 V</b> at the TCM wiring harness-side connector terminals?</li> </ul>	Yes	Go to Step 11.
		No	Go to the next step.
10	<b>INSPECT SHIFT SOLENOID D CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the couple component connector.</li> <li>Turn the ignition switch to the ON position (engine off).</li> </ul>	Yes	Repair or replace the wiring harness (TCM—couple component) for short to power supply, then go to the next step.
		No	Repair or replace the wiring harness (couple component—shift solenoid D) for short to power supply, then go to the next step.



	<ul style="list-style-type: none"><li>• Measure the voltage at couple component (wiring harness-side) terminal L.</li><li>• Is there <b>0 V</b> at the TCM wiring harness-side connector terminals?</li></ul>		
11	<b>VERIFY TROUBLESHOOTING OF DTC P0983 COMPLETED</b> <ul style="list-style-type: none"><li>• Make sure to reconnect all the disconnected connectors.</li><li>• Clear the DTC from the memory using the M-MDS.</li><li>• Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li><li>• Is same DTC present?</li></ul>	Yes	Replace the TCM, then go to the next step. (See <b>TCM REMOVAL/INSTALLATION [SJ6A-EL]</b> .)
		No	Go to the next step.
12	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "After Repair Procedure". (See <b>AFTER REPAIR PROCEDURE [SJ6A-EL]</b>.)</li><li>• Are any DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [SJ6A-EL]</b> .)
		No	Troubleshooting completed.

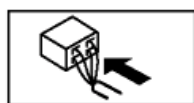
2008 - MX-5 - Transmission/Transaxle

DTC P0985 [SJ6A-EL]

DTC P0985	Shift solenoid E circuit malfunction (short to ground)
DETECTION CONDITION	<ul style="list-style-type: none"><li>Short to ground in shift solenoid E signal system (while TCM monitors solenoid output voltage, the voltage that differs from the signal output by CPU in TCM is detected)</li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>The MIL illuminates if the TCM detects the above malfunction condition during first drive cycle.</li><li>A PENDING CODE is not available.</li><li>FREEZE FRAME DATA is available.</li><li>The AT warning light illuminates.</li><li>The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Short to ground in wiring harness between shift solenoid E terminal A and TCM terminal 1V</li><li>Shift solenoid E malfunction</li><li>Damaged connector between shift solenoid E and TCM</li><li>TCM malfunction</li></ul>

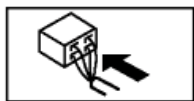
# **AUTOMATIC TRANSMISSION WIRING HARNESS-SIDE CONNECTOR (COUPLE COMPONENT)**

O	M	K	I	G	E	C	A
N	L	J	H	F	D	B	

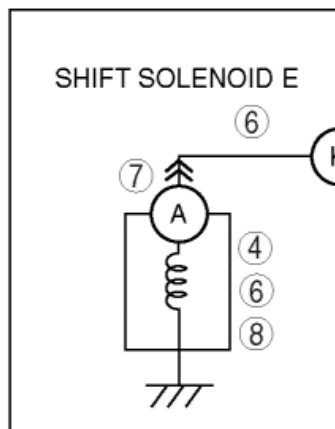


## **SHIFT SOLENOID E WIRING HARNESS-SIDE CONNECTOR**

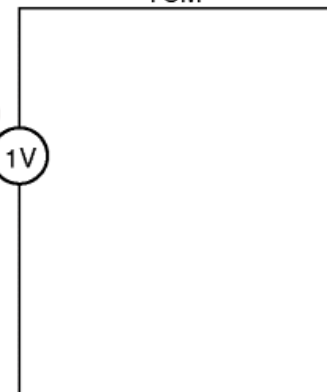
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# **AUTOMATIC TRANSMISSION (COUPLE COMPONENT)**

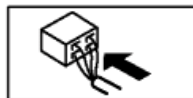


## **TCM**

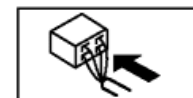


## **TCM WIRING HARNESS-SIDE CONNECTOR**

	1AF	1AA	1Y	1R	1P		1H	1D	
1AG	1AC	1AB	1Z	1V	1S	1Q	1O	1L	1I
1AH	1AD		1W	1T			1M	1J	1F
1AI	1AE		1X	1U			1N	1K	1G



2AF	2AB		2R	2O	2J	2F	
2AG	2AC	2Y	2V	2S	2P	2M	2K
2AH	2AD	2Z	2W	2T	2Q	2N	2L
2AI	2AE	2AA	2X	2U		2I	2E



## **Diagnostic procedure**

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.  No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> No Go to the next step.
3	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the TCM connector.</li> <li>Inspect for poor connection at TCM terminal 1V (such as damaged/pulled-out pins, corrosion).</li> </ul>	Yes Go to the next step.  No Repair or replace the connector and/or terminal, then go to Step 9.

	<ul style="list-style-type: none"> <li>Is terminal normal?</li> </ul>		
4	<b>INSPECT RESISTANCE OF SHIFT SOLENOID E CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for resistance between TCM terminal 1V (wiring harness-side) and body ground.</li> <li>Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to Step 9.
		No	Go to the next step.
5	<b>INSPECT COUPLE COMPONENT CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the couple component connector.</li> <li>Inspect for poor connection at couple component terminal K (such as damaged/pulled-out pins, corrosion).</li> <li>Is terminal normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 9.
6	<b>INSPECT RESISTANCE OF SHIFT SOLENOID E CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect the resistance between couple component (transmission case side) terminal K and body ground.</li> <li>Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to the next step.
		No	Go to Step 9.
7	<b>INSPECT SHIFT SOLENOID E CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the shift solenoid E connector.</li> <li>Inspect for poor connection at shift solenoid E terminal A (such as damaged/pulled-out pins, corrosion).</li> <li>Is terminal normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 9.
8	<b>INSPECT SHIFT SOLENOID E</b> <ul style="list-style-type: none"> <li>Inspect the shift solenoid E. (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> <li>Is the shift solenoid E normal?</li> </ul>	Yes	Repair or replace the wiring harness (couple component connector—shift solenoid E) for short to ground, then go to the next step.
		No	Replace the control valve body, then go to the next step. (See <a href="#">CONTROL VALVE BODY REMOVAL [SJ6A-EL]</a> .) (See <a href="#">CONTROL VALVE BODY INSTALLATION [SJ6A-EL]</a> .)
9	<b>VERIFY TROUBLESHOOTING OF DTC P0985 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all the disconnected connectors.</li> <li>Clear the DTC from the memory using the M-MDS.</li> <li>Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li> <li>Is same DTC present?</li> </ul>	Yes	Replace the TCM, then go to the next step. (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL]</a> .)
		No	Go to the next step.
10	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the “After Repair Procedure”. (See <a href="#">AFTER REPAIR PROCEDURE [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [SJ6A-EL]</a> .)

	• Are any DTCs present?	No	Troubleshooting completed.
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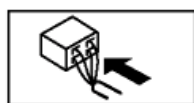
2008 - MX-5 - Transmission/Transaxle

DTC P0986 [SJ6A-EL]

DTC P0986	Shift solenoid E circuit malfunction (short to power/open circuit)
DETECTION CONDITION	<ul style="list-style-type: none"><li>• Open or short circuit in shift solenoid E signal system (while TCM monitors solenoid output voltage, the voltage that differs from the signal output by CPU in TCM is detected).</li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>• The MIL illuminates if the TCM detects the above malfunction condition during first drive cycle.</li><li>• A PENDING CODE is not available.</li><li>• FREEZE FRAME DATA is available.</li><li>• The AT warning light illuminates.</li><li>• The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Open circuit in wiring harness between shift solenoid E terminal A and TCM terminal 1V</li><li>• Short to power in wiring harness between shift solenoid E terminal A and TCM terminal 1V</li><li>• Shift solenoid E malfunction</li><li>• Damaged connector between shift solenoid E and TCM</li><li>• TCM malfunction</li></ul>

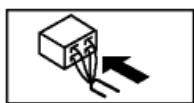
**AUTOMATIC TRANSMISSION  
WIRING HARNESS-SIDE CONNECTOR  
(COUPLE COMPONENT)**

O	M	K	I	G	E	C	A
N	L	J	H	F	D	B	

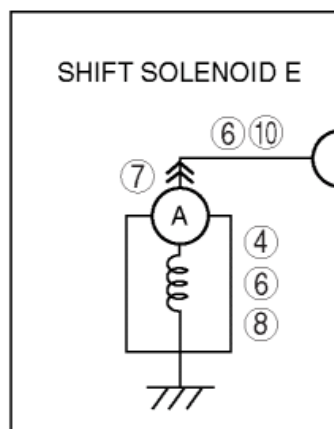


**SHIFT SOLENOID E WIRING  
HARNESS-SIDE CONNECTOR**

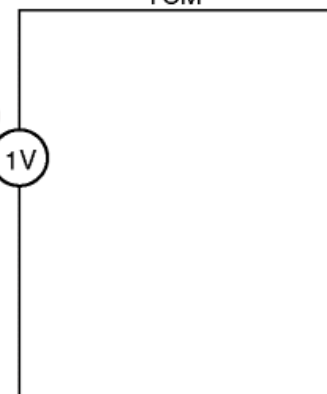
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**AUTOMATIC TRANSMISSION  
(COUPLE COMPONENT)**

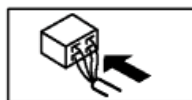


**TCM**

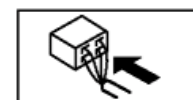


**TCM WIRING HARNESS-SIDE CONNECTOR**

	1AF	1AA	1Y	1R	1P		1H	1D	
1AG	1AC	1AB	1Z	1V	1S	1Q	1O	1L	1I
1AH	1AD		1W	1T			1M	1J	1F
1AI	1AE		1X	1U			1N	1K	1G



2AF	2AB		2R	2O	2J	2F	
2AG	2AC	2Y	2V	2S	2P	2M	2K
2AH	2AD	2Z	2W	2T	2Q	2N	2L
2AI	2AE	2AA	2X	2U		2I	2E



**Diagnostic procedure**

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Record the FREEZE FRAME DATA on the repair order, then go to the next step.</p>
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	<p>Yes Perform repair or diagnosis according to the available repair information.</p> <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> <p>No Go to the next step.</p>
3	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the TCM connector.</li> <li>Inspect for poor connection at TCM terminal 1V (such as damaged/pulled-out pins, corrosion).</li> <li>Is terminal normal?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Repair or replace the connector and/or terminal, then go to Step 11.</p>

4	<b>INSPECT RESISTANCE OF SHIFT SOLENOID E CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for resistance between TCM terminal 1V (wiring harness-side) and body ground.</li> <li>Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to Step 9.
		No	Go to the next step.
5	<b>INSPECT COUPLE COMPONENT CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the couple component connector.</li> <li>Inspect for poor connection at couple component terminal K (such as damaged/pulled-out pins, corrosion).</li> <li>Is terminal normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 11.
6	<b>INSPECT RESISTANCE OF SHIFT SOLENOID E CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect the resistance between couple component (transmission case side) terminal K and body ground.</li> <li>Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to Step 11.
		No	Go to the next step.
7	<b>INSPECT SHIFT SOLENOID E CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the shift solenoid E connector.</li> <li>Inspect for poor connection at shift solenoid E terminal A (such as damaged/pulled-out pins, corrosion).</li> <li>Is terminal normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 11.
8	<b>INSPECT SHIFT SOLENOID E</b> <ul style="list-style-type: none"> <li>Inspect the shift solenoid E. (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> <li>Is the shift solenoid E normal?</li> </ul>	Yes	Repair or replace the wiring harness (couple component—shift solenoid E) for short to ground, then go to Step 11.
		No	Replace the control valve body, then go to Step 11. (See <a href="#">CONTROL VALVE BODY REMOVAL [SJ6A-EL]</a> .) (See <a href="#">CONTROL VALVE BODY INSTALLATION [SJ6A-EL]</a> .)
9	<b>INSPECT SHIFT SOLENOID E CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (engine off).</li> <li>Measure the voltage at TCM (wiring harness-side) terminal 1V.</li> <li>Is there <b>0 V</b> at the TCM wiring harness-side connector terminals?</li> </ul>	Yes	Go to Step 11.
		No	Go to the next step.
10	<b>INSPECT SHIFT SOLENOID E CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the couple component connector.</li> <li>Turn the ignition switch to the ON position (engine off).</li> <li>Measure the voltage at couple component</li> </ul>	Yes	Repair or replace the wiring harness (TCM—couple component) for short to power supply, then go to the next step.
		No	Repair or replace the wiring harness (couple component—shift solenoid E) for short to power supply, then go to the next step.



	(wiring harness-side) terminal K.  • Is there <b>0 V</b> at the TCM wiring harness-side connector terminals?		
11	<b>VERIFY TROUBLESHOOTING OF DTC P0986 COMPLETED</b>  • Make sure to reconnect all the disconnected connectors.  • Clear the DTC from the memory using the M-MDS.  • Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.  • Is same DTC present?	Yes Replace the TCM, then go to the next step.  (See <b>TCM REMOVAL/INSTALLATION [SJ6A-EL]</b> .)	
		No Go to the next step.	
12	<b>VERIFY AFTER REPAIR PROCEDURE</b>  • Perform the "After Repair Procedure". (See <b>AFTER REPAIR PROCEDURE [SJ6A-EL]</b> .)  • Are any DTCs present?	Yes Go to the applicable DTC inspection.  (See <b>DTC TABLE [SJ6A-EL]</b> .)	
		No Troubleshooting completed.	

## 2008 - MX-5 - Transmission/Transaxle

### DTC P2757 [SJ6A-EL]

DTC P2757	Torque converter clutch (TCC) stuck off
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>TCM detects that TCC control solenoid does not change from on when engine is running</li> </ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"> <li>The MIL illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available.</li> <li>FREEZE FRAME DATA is available.</li> <li>The AT warning light illuminates.</li> <li>The DTC is stored in the TCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>ATF level low</li> <li>Deteriorated ATF</li> <li>TCC control solenoid, and line pressure control solenoid stuck</li> <li>Line pressure low</li> <li>Control valve stuck.</li> <li>TCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins</li> </ul>	Yes Perform repair or diagnosis according to the available repair information.

	<p>and/or on-line repair information availability.</p> <ul style="list-style-type: none"> <li>Is any related repair information available?</li> </ul>		<ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<p><b>INSPECT ATF CONDITION</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Inspect the ATF condition. <ul style="list-style-type: none"> <li>Clear red: Normal</li> <li>Light red (pink): Water mixed in fluid</li> <li>Reddish brown: Deteriorated ATF</li> </ul> </li> <li>Is it normal?</li> </ul> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) INSPECTION</b>[SJ6A-EL].)</p>	Yes	Go to the next step.
		No	<p>If the ATF color is milky or reddish brown, replace ATF, then go to Step 7.</p> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) REPLACEMENT</b> [SJ6A-EL].)</p>
4	<p><b>INSPECT ATF LEVEL</b></p> <ul style="list-style-type: none"> <li>Start the engine.</li> <li>Warm up the AT.</li> <li>Is the ATF level within the specification?</li> </ul> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT</b> [SJ6A-EL].)</p>	Yes	Go to the next step.
		No	<p>Add ATF to the specified level, then go to Step 7.</p> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT</b> [SJ6A-EL].)</p>
5	<p><b>INSPECT LINE PRESSURE</b></p> <ul style="list-style-type: none"> <li>Start the engine.</li> <li>Measure the line pressure.</li> </ul> <p>(See <b>MECHANICAL SYSTEM TEST</b>[SJ6A-EL].)</p> <ul style="list-style-type: none"> <li>Are the line pressures within the specifications?</li> </ul>	Yes	Go to the next step.
		No	<p>All ranges: Replace the oil pump, then go to Step 7.</p> <p>Any ranges: Replace the control valve body, then go to Step 6.</p> <p>(See <b>CONTROL VALVE BODY REMOVAL</b> [SJ6A-EL].)</p> <p>(See <b>CONTROL VALVE BODY INSTALLATION</b> [SJ6A-EL].)</p>
6	<p><b>INSPECT SOLENOID VALVE</b></p> <ul style="list-style-type: none"> <li>Inspect the solenoid valve.</li> </ul> <p>(See <b>SOLENOID VALVE INSPECTION</b></p>	Yes	Go to the next step.
		No	Replace the control valve body, then go to

	<p><a href="#">[SJ6A-EL].</a>)</p> <ul style="list-style-type: none"><li>Is it normal?</li></ul>		<p>the next step.</p> <p>(See <a href="#">CONTROL VALVE BODY REMOVAL [SJ6A-EL].</a>)</p> <p>(See <a href="#">CONTROL VALVE BODY INSTALLATION [SJ6A-EL].</a>)</p>
7	<p><b>VERIFY TROUBLESHOOTING OF DTC P2757 COMPLETED</b></p> <ul style="list-style-type: none"><li>Make sure to reconnect all the disconnected connectors.</li><li>Clear the DTC from the memory using the M-MDS.</li><li>Start the engine.</li><li>Warm up engine and AT.</li><li>Drive the vehicle under the following conditions for <b>2 s or more</b>.<ul style="list-style-type: none"><li>ATF temperature (TFT PID): <b>20 °C {68 °F} or more</b></li><li>Drive in the D range, 4GR—6GR (TCC no operation)</li></ul></li><li>Is PENDING CODE for this the DTC present?</li></ul>	Yes	<p>Replace the TCM, then go to the next step.</p> <p>(See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL].</a>)</p>
		No	<p>Go to the next step.</p>
8	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"><li>Perform the “After Repair Procedure”. (See <a href="#">AFTER REPAIR PROCEDURE [SJ6A-EL].</a>)</li><li>Are any DTCs present?</li></ul>	Yes	<p>Go to the applicable DTC inspection.</p> <p>(See <a href="#">DTC TABLE [SJ6A-EL].</a>)</p>
		No	<p>DTC troubleshooting completed.</p>

## 2008 - MX-5 - Transmission/Transaxle

### DTC P2758 [SJ6A-EL]

DTC P2758	Torque converter clutch (TCC) stuck on
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>TCM detects that TCC control solenoid does not change from off when engine is running</li> </ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"> <li>The MIL illuminates if the TCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available.</li> <li>FREEZE FRAME DATA is not available.</li> <li>The AT warning light illuminates.</li> <li>The DTC is stored in the PCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>ATF level low</li> <li>Deteriorated ATF</li> <li>TCC control solenoid, and line pressure control solenoid stuck</li> <li>Line pressure low</li> <li>Control valve stuck</li> <li>TCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins</li> </ul>	Yes Perform repair or diagnosis according to the available repair information.

	<p>and/or on-line repair information availability.</p> <ul style="list-style-type: none"><li>Is any related repair information available?</li></ul>		<ul style="list-style-type: none"><li>If the vehicle is not repaired, go to the next step.</li></ul>
		No	Go to the next step.
3	<b>INSPECT ATF CONDITION</b> <ul style="list-style-type: none"><li>Turn the ignition switch to the LOCK position.</li><li>Inspect the ATF condition.<ul style="list-style-type: none"><li>Clear red: Normal</li><li>Light red (pink): Water mixed in fluid</li><li>Reddish brown: Deteriorated ATF</li></ul></li><li>Is it normal?</li></ul> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) INSPECTION</b>[SJ6A-EL].)</p>	Yes	Go to the next step.
		No	If the ATF color is milky or reddish brown, replace ATF, then go to Step 7.  (See <b>AUTOMATIC TRANSMISSION FLUID (ATF) REPLACEMENT</b> [SJ6A-EL].)
4	<b>INSPECT ATF LEVEL</b> <ul style="list-style-type: none"><li>Start the engine.</li><li>Warm up the AT.</li><li>Is the ATF level within the specification?</li></ul> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT</b> [SJ6A-EL].)</p>	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7.  (See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT</b> [SJ6A-EL].)
5	<b>INSPECT LINE PRESSURE</b> <ul style="list-style-type: none"><li>Start the engine.</li><li>Measure the line pressure.</li></ul> <p>(See <b>MECHANICAL SYSTEM TEST</b>[SJ6A-EL].)</p> <ul style="list-style-type: none"><li>Are the line pressures within the specifications?</li></ul>	Yes	Go to the next step.
		No	All ranges: Replace the oil pump, then go to Step 7.  Any ranges: Replace the control valve body, then go to Step 6.  (See <b>CONTROL VALVE BODY REMOVAL</b> [SJ6A-EL].)  (See <b>CONTROL VALVE BODY INSTALLATION</b> [SJ6A-EL].)
6	<b>INSPECT SOLENOID VALVE</b> <ul style="list-style-type: none"><li>Inspect the solenoid valve.</li></ul> <p>(See <b>SOLENOID VALVE INSPECTION</b></p>	Yes	Go to the next step.
		No	Replace the control valve body, then go to

	<p><a href="#">[SJ6A-EL].</a>)</p> <ul style="list-style-type: none"><li>Is it normal?</li></ul>		<p>the next step.</p> <p>(See <a href="#">CONTROL VALVE BODY REMOVAL [SJ6A-EL].</a>)</p> <p>(See <a href="#">CONTROL VALVE BODY INSTALLATION [SJ6A-EL].</a>)</p>
7	<b>VERIFY TROUBLESHOOTING OF DTC P2758 COMPLETED</b> <ul style="list-style-type: none"><li>Make sure to reconnect all the disconnected connectors.</li><li>Clear the DTC from the memory using the M-MDS.</li><li>Start the engine.</li><li>Warm up engine and AT.</li><li>Drive the vehicle under the following conditions for <b>2 s or more</b>.<ul style="list-style-type: none"><li>ATF temperature (TFT PID): <b>20 °C {68 °F} or more</b></li><li>Engine speed: <b>less than 3,000 rpm</b></li><li>Drive in the D range, 4GR—6GR (TCC operation)</li></ul></li><li>Is PENDING CODE for this the DTC present?</li></ul>	Yes	Replace the TCM, then go to the next step.  (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL].</a> )
		No	Go to the next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>Perform the “After Repair Procedure”.  (See <a href="#">AFTER REPAIR PROCEDURE [SJ6A-EL].</a>)</li><li>Are any DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection.  (See <a href="#">DTC TABLE [SJ6A-EL].</a> )
		No	DTC troubleshooting completed.

## 2008 - MX-5 - Transmission/Transaxle

### DTC P2762 [SJ6A-EL]

DTC P2762	TCC control solenoid range/performance (stuck)
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>Feedback current corresponding to solenoid current command value is irregular when engine is running.</li> </ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"> <li>The MIL illuminates if the TCM detects the above malfunction condition during the first drive cycle.</li> <li>A PENDING CODE is not available.</li> <li>FREEZE FRAME DATA is available.</li> <li>The AT warning light illuminates.</li> <li>The DTC is stored in the TCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>ATF level low</li> <li>Deteriorated ATF</li> <li>TCC control solenoid stuck</li> <li>Control valve stuck</li> <li>TCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b>	Yes Perform repair or diagnosis according to the available repair information.
	<ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> </ul>	<ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next</li> </ul>



	<ul style="list-style-type: none"> <li>Is any related repair information available?</li> </ul>		step.
		No	Go to the next step.
3	<b>INSPECT ATF CONDITION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Inspect the ATF condition. <ul style="list-style-type: none"> <li>Clear red: Normal</li> <li>Light red (pink): Water mixed in fluid</li> <li>Reddish brown: Deteriorated ATF</li> </ul> </li> <li>Is it normal?</li> </ul> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) INSPECTION</b>[SJ6A-EL].)</p>	Yes	Go to the next step.
		No	<p>If the ATF color is light red or reddish brown, replace ATF, then go to Step 6.</p> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) REPLACEMENT</b> [SJ6A-EL].)</p>
4	<b>INSPECT ATF LEVEL</b> <ul style="list-style-type: none"> <li>Start the engine.</li> <li>Warm up the AT.</li> <li>Is the ATF level within the specification?</li> </ul> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT</b> [SJ6A-EL].)</p>	Yes	Go to the next step.
		No	<p>Add ATF to the specified level, then go to Step 6.</p> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT</b> [SJ6A-EL].)</p>
5	<b>INSPECT LINE PRESSURE</b> <ul style="list-style-type: none"> <li>Start the engine.</li> <li>Measure the line pressure.</li> </ul> <p>(See <b>MECHANICAL SYSTEM TEST</b>[SJ6A-EL].)</p> <ul style="list-style-type: none"> <li>Are the line pressures within the specifications?</li> </ul>	Yes	Go to the next step.
		No	<ul style="list-style-type: none"> <li>All ranges: Replace the oil pump or control valve body, then go to the next step.</li> <li>Any ranges: Replace the AT, then go the next step.</li> </ul> <p>(See <b>AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION</b> [SJ6A-EL].)</p>
6	<b>VERIFY TROUBLESHOOTING OF DTC P2762 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all the disconnected connectors.</li> </ul>	Yes	<p>Replace the TCM, then go to the next step.</p> <p>(See <b>TCM REMOVAL/INSTALLATION</b> [SJ6A-EL].)</p>

	<ul style="list-style-type: none"><li>• Clear the DTC from the memory using the M-MDS.</li><li>• Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR (TCC operation).</li><li>• Is same DTC present?</li></ul>		No	Go to the next step.
7	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "After Repair Procedure". (See <b>AFTER REPAIR PROCEDURE [SJ6A-EL]</b>.)</li><li>• Are any DTCs present?</li></ul>	Yes		Go to the applicable DTC inspection. (See <b>DTC TABLE [SJ6A-EL]</b> .)
		No		Troubleshooting completed.

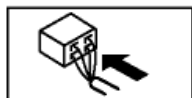
2008 - MX-5 - Transmission/Transaxle

DTC P2763 [SJ6A-EL]

DTC P2763	TCC control solenoid circuit malfunction (short to power)
DETECTION CONDITION	<ul style="list-style-type: none"><li>Short circuit in TCC control solenoid signal system (while TCM monitors solenoid output voltage, the voltage that differs from the signal output by CPU in TCM is detected).</li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>The MIL illuminates if the TCM detects the above malfunction condition during the first drive cycle.</li><li>A PENDING CODE is not available.</li><li>FREEZE FRAME DATA is available.</li><li>The AT warning light illuminates.</li><li>The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Short to power in wiring harness between TCC control solenoid terminal B and TCM terminal 1Q</li><li>Short to power in wiring harness between TCC control solenoid terminal A and TCM terminal 1D</li><li>TCC control solenoid malfunction</li><li>Damaged connector between TCC control solenoid and TCM</li><li>TCM malfunction</li></ul>

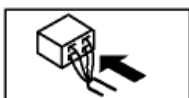
# **AUTOMATIC TRANSMISSION WIRING HARNESS-SIDE CONNECTOR (COUPLE COMPONENT)**

O	M	K	I	G	E	C	A
N	L	J	H	F	D	B	

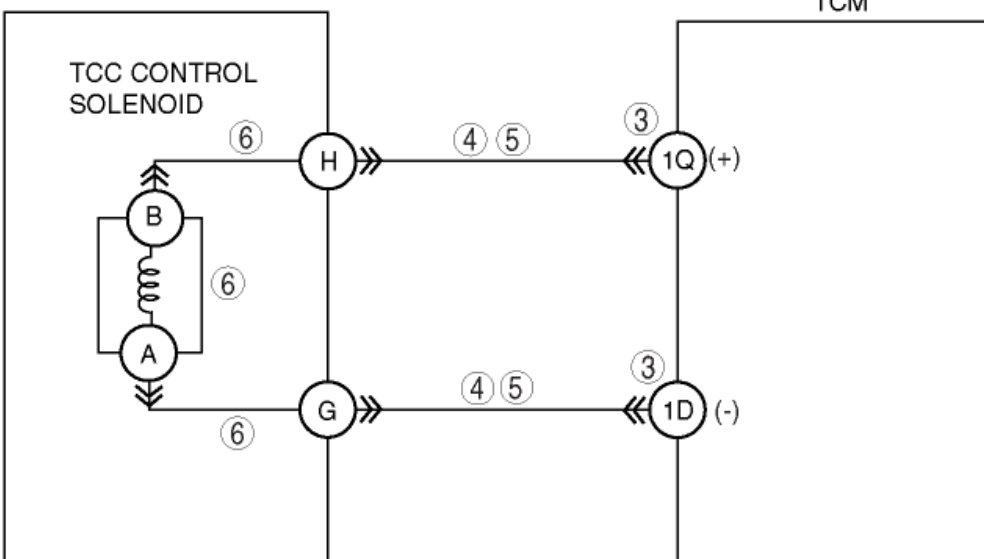


# **TCC CONTROL SOLENOID WIRING HARNESS-SIDE CONNECTOR**

B	A
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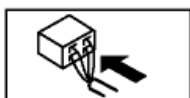


# **AUTOMATIC TRANSMISSION (COUPLE COMPONENT)**

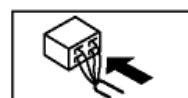


# **TCM WIRING HARNESS-SIDE CONNECTOR**

	1AF	1AA	1Y	1R	1P		1H	1D
1AG	1AC	1AB	1Z	1V	1S	1Q	1O	1L
1AH	1AD		1W	1T		1M	1J	1F
1AI	1AE		1X	1U		1N	1K	1G



	2AF	2AB		2R	2O	2J	2F	
2AG	2AC	2Y	2V	2S	2P	2M	2K	2G
2AH	2AD	2Z	2W	2T	2Q	2N	2L	2H
2AI	2AE	2AA	2X	2U			2I	2E



## **Diagnostic procedure**

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Record the FREEZE FRAME DATA on the repair order, then go to the next step.</p>
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	<p>Yes Perform repair or diagnosis according to the available repair information.</p> <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> <p>No Go to the next step.</p>
3	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the TCM connector.</li> <li>Inspect for poor connection at TCM terminals 1Q and 1D (such as damaged/pulled-out pins, corrosion).</li> </ul>	<p>Yes Go to the next step.</p> <p>No Repair or replace the connector and/or terminal, then go to Step 7.</p>

	<ul style="list-style-type: none"> <li>Are terminals normal?</li> </ul>		
4	<b>INSPECT TCC CONTROL SOLENOID CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (engine off).</li> <li>Measure the voltage at TCM (wiring harness-side) terminals 1Q and 1D.</li> <li>Is there <b>0 V</b> at the TCM wiring harness-side connector terminals?</li> </ul>	Yes	Go to go to Step 7.
		No	Go to the next step.
5	<b>INSPECT TCC CONTROL SOLENOID CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the couple component connector.</li> <li>Turn the ignition switch to the ON position (engine off).</li> <li>Measure the voltage at TCM (wiring harness-side) terminals 1Q and 1D.</li> <li>Is there <b>0 V</b> at the TCM wiring harness-side connector terminals?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness (TCM—couple component connector) for short to power supply, then go to Step 7.
6	<b>INSPECT TCC CONTROL SOLENOID</b> <ul style="list-style-type: none"> <li>Inspect the TCC control solenoid. (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> <li>Is the TCC control solenoid normal?</li> </ul>	Yes	Repair or replace the wiring harness (couple component connector—TCC control solenoid) for short to power supply, then go to the next step.
		No	Replace the control valve body, then go to the next step. (See <a href="#">CONTROL VALVE BODY REMOVAL [SJ6A-EL]</a> .) (See <a href="#">CONTROL VALVE BODY INSTALLATION [SJ6A-EL]</a> .)
7	<b>VERIFY TROUBLESHOOTING OF DTC P2763 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all the disconnected connectors.</li> <li>Clear the DTC from the memory using the M-MDS.</li> <li>Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li> <li>Is same DTC present?</li> </ul>	Yes	Replace the TCM, then go to the next step. (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL]</a> .)
		No	Go to the next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the “After Repair Procedure”. (See <a href="#">AFTER REPAIR PROCEDURE [SJ6A-EL]</a>.)</li> <li>Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [SJ6A-EL]</a> .)
		No	Troubleshooting completed.

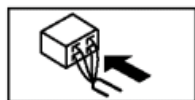
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DTC P2764 [SJ6A-EL]

DTC P2764	TCC control solenoid circuit malfunction (short to ground/open circuit)
DETECTION CONDITION	<ul style="list-style-type: none"><li>• Open or short circuit in TCC control solenoid signal system (while TCM monitors solenoid output voltage, the voltage that differs from the signal output by CPU in TCM is detected).</li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>• The MIL illuminates if the TCM detects the above malfunction condition during the first drive cycle.</li><li>• A PENDING CODE is not available.</li><li>• FREEZE FRAME DATA is available.</li><li>• The AT warning light illuminates.</li><li>• The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Open circuit between TCC control solenoid terminal B and TCM terminal 1Q</li><li>• Open circuit between TCC control solenoid terminal A and TCM terminal 1D</li><li>• Short to ground in wiring harness between TCC control solenoid terminal B and TCM terminal 1Q</li><li>• Short to ground in wiring harness between TCC control solenoid terminal A and TCM terminal 1D</li><li>• TCC control solenoid malfunction</li><li>• Damaged connector between TCC control solenoid and TCM</li><li>• TCM malfunction</li></ul>

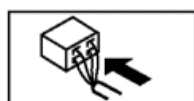
# AUTOMATIC TRANSMISSION WIRING HARNESS-SIDE CONNECTOR (COUPLE COMPONENT)

O	M	K	I	G	E	C	A
N	L	J	H	F	D	B	

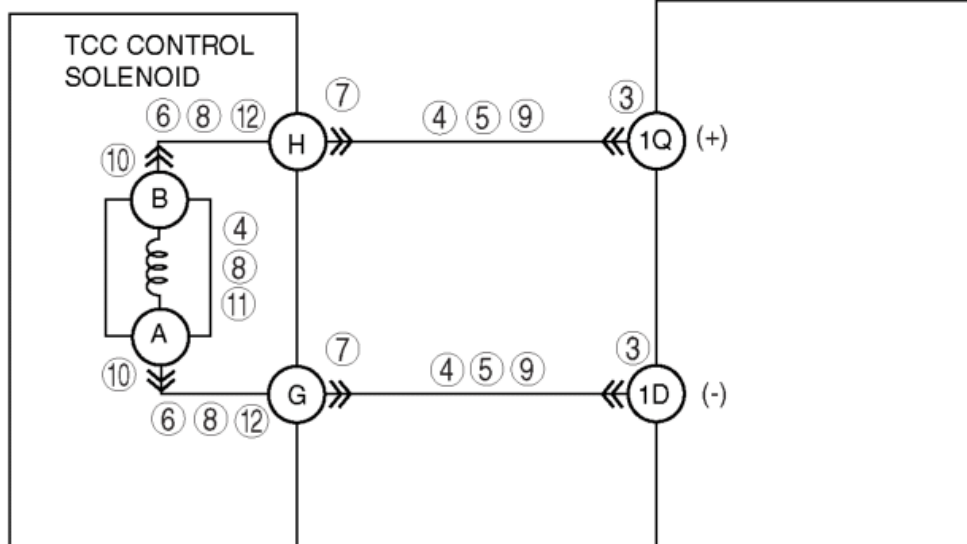


# TCC CONTROL SOLENOID WIRING HARNESS-SIDE CONNECTOR

B	A
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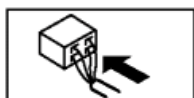


# AUTOMATIC TRANSMISSION (COUPLE COMPONENT)

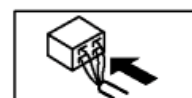


# TCM WIRING HARNESS-SIDE CONNECTOR

<div></div>											
	1AF	1AA	1Y	1R	1P			1H	1D		
1AG	1AC	1AB	1Z	1V	1S	1Q	1O	1L	1I	1E	1A
1AH	1AD			1W	1T			1M	1J	1F	1B
1AI	1AE			1X	1U			1N	1K	1G	1C



<div></div>										
2AF	2AB			2R	2O	2J	2F			
2AG	2AC	2Y	2V	2S	2P	2M	2K	2G	2C	
2AH	2AD	2Z	2W	2T	2Q	2N	2L	2H	2D	2A
2AI	2AE	2AA	2X	2U				2I	2E	2B



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.  No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> No Go to the next step.
3	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the TCM connector.</li> <li>Inspect for poor connection at TCM terminals 1Q and 1D (such as damaged/pulled-out pins, corrosion).</li> </ul>	Yes Go to the next step.  No Repair or replace the connector and/or terminal, then go to Step 13.

	<ul style="list-style-type: none"> <li>• Are terminals normal?</li> </ul>		
4	<b>INSPECT RESISTANCE OF TCC CONTROL SOLENOID CIRCUIT</b> <ul style="list-style-type: none"> <li>• Inspect for resistance between TCM terminals 1Q and 1D (wiring harness-side).</li> <li>• Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to the next step.
		No	Go to go to Step 7.
5	<b>INSPECT TCC CONTROL SOLENOID CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Disconnect the couple component connector.</li> <li>• Inspect for continuity between TCM terminals (wiring harness-side) and body ground. <ul style="list-style-type: none"> <li>▪ Terminal 1Q and body ground</li> <li>▪ Terminal 1D and body ground</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for short to ground, then go to Step 13.
6	<b>INSPECT TCC CONTROL SOLENOID CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between couple component terminals (wiring harness-side) and body ground. <ul style="list-style-type: none"> <li>▪ Terminal H and body ground</li> <li>▪ Terminal G and body ground</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes	Go to go to Step 13.
		No	Repair or replace the couple component, then go to the next step.
7	<b>INSPECT COUPLE COMPONENT CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Disconnect the couple component connector.</li> <li>• Inspect for poor connection at couple component terminals H and G (such as damaged/pulled-out pins, corrosion).</li> <li>• Are terminals normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 13.
8	<b>INSPECT RESISTANCE OF TCC CONTROL SOLENOID CIRCUIT</b> <ul style="list-style-type: none"> <li>• Inspect the resistance between couple component (transmission case side) terminals H and G.</li> <li>• Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to the next step.
		No	Go to Step 10.
9	<b>INSPECT TCC CONTROL SOLENOID CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between TCM terminals and couple component terminals (wiring harness-side). <ul style="list-style-type: none"> <li>▪ Terminal 1Q and terminal H</li> <li>▪ Terminal 1D and terminal G</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes	Go to Step 13.
		No	Repair or replace the wiring harness for open circuit, go to Step 13.
10	<b>INSPECT TCC CONTROL SOLENOID CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Disconnect the TCC control solenoid connector.</li> <li>• Inspect for poor connection at TCC control solenoid terminals A and B (such as damaged/pulled-out pins, corrosion).</li> <li>• Are terminals normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 13.
11	<b>INSPECT TCC CONTROL SOLENOID</b> <ul style="list-style-type: none"> <li>• Inspect the TCC control solenoid. (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to the next step.
		No	Replace the control valve body, then go to

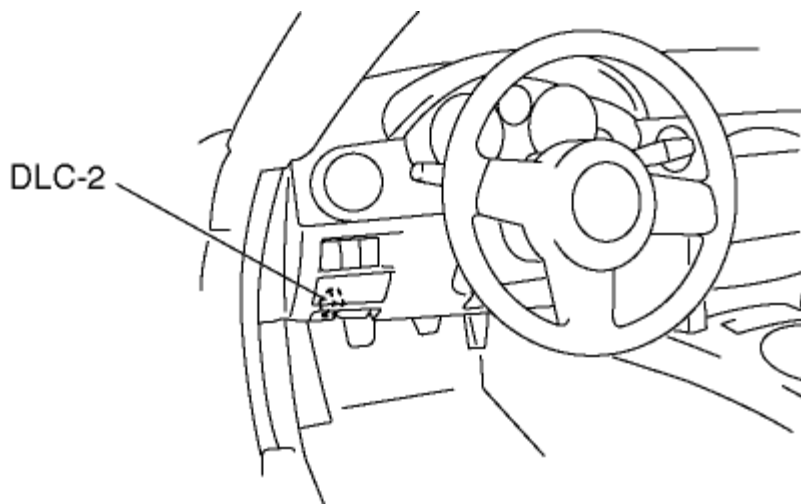


	<ul style="list-style-type: none"> <li>Is the TCC control solenoid normal?</li> </ul>	Step 13. (See <a href="#">CONTROL VALVE BODY REMOVAL [SJ6A-EL].</a> ) (See <a href="#">CONTROL VALVE BODY INSTALLATION [SJ6A-EL].</a> )
12	<b>INSPECT TCC CONTROL SOLENOID CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for continuity between couple component terminals and TCC control solenoid terminals (wiring harness-side).               <ul style="list-style-type: none"> <li>Terminal H and terminal B</li> <li>Terminal G and terminal A</li> </ul> </li> <li>Is there continuity?</li> </ul>	Yes Go to the next step. No Repair or replace the couple component, then go to the next step.
13	<b>VERIFY TROUBLESHOOTING OF DTC P2764 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all the disconnected connectors.</li> <li>Clear the DTC from the memory using the M-MDS.</li> <li>Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li> <li>Is same DTC present?</li> </ul>	Yes Replace the TCM, then go to the next step. (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL].</a> ) No Go to the next step.
14	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the "After Repair Procedure".                (See <a href="#">AFTER REPAIR PROCEDURE [SJ6A-EL].</a>)</li> <li>Are any DTCs present?</li> </ul>	Yes Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [SJ6A-EL].</a> ) No Troubleshooting completed.

## 2008 - MX-5 - Transmission/Transaxle

### PID/DATA MONITOR INSPECTION [SJ6A-EL]

1. Connect the M-MDS to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  1. Select "DataLogger".
  2. Select "Modules".
  3. Select "TCM".
- When using the PDS (Pocket PC)
  1. Select "Module Tests".
  2. Select "TCM".
  3. Select "DataLogger".

3. Select the applicable PID from the PID table.
4. Verify the PID data according to the directions on the screen.

#### NOTE:

- The PID data screen function is used for monitoring the calculated value of input/output signals in the module. Therefore, if the monitored value of the output parts is not within the specification, it is necessary to inspect the monitored value of input parts corresponding to the applicable output part control. In addition, because the system does not display an output part malfunction as an abnormality in the monitored value, it is necessary to inspect the output parts individually.

#### PID/DATA MONITOR AND RECORD function table

Monitor item (Definition)	Unit/Condition	Condition/Specification	Action	TCM terminal
BOO TCM (Brake switch)	On/Off	<ul style="list-style-type: none"> <li>Brake pedal depressed: On</li> <li>Other: Off</li> </ul>	Inspect the brake switch. (See <b>BRAKE SWITCH INSPECTION</b> .)	N/A
DTC CNT	N/A	Indicates number of DTC	Check DTC. (See <b>DTC TABLE [SJ6A-EL]</b> .)	N/A
DWN SW (Down switch)	On/Off	<ul style="list-style-type: none"> <li>Down shift at M range: On</li> <li>Other: Off</li> </ul>	Inspect the selector lever component. (See <b>SELECTOR LEVER COMPONENT INSPECTION</b> .)	2F
ECT TCM (ECT)	°C	Indicates ECT	<ul style="list-style-type: none"> <li>Inspect the ECT sensor.  (See <b>ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [LF]</b>.)</li> <li>Inspect the PCM.  (See <b>PCM INSPECTION [LF]</b>.)</li> </ul>	N/A
FDPDTC (FREEZE FRAME DATA)	N/A	Indicates code of FREEZE FRAME DATA	N/A	N/A
GEAR_RA (Gear ratio)	N/A	<ul style="list-style-type: none"> <li>1GR: 3.538</li> <li>2GR: 2.060</li> <li>3GR: 1.404</li> <li>4GR: 1.000</li> <li>5GR: 0.713</li> <li>6GR: 0.582</li> <li>R position: 3.168</li> </ul>	Inspect following PIDs: OSS, SSA, SSB, SSC, SSD, SSE SSF, SSG, THOP, TSS, VSS	N/A
		<ul style="list-style-type: none"> <li>1GR: 1</li> </ul>	Inspect following PIDs: SSA, SSB,	

GEAR_SEL (Calculated gear range in TCM)	1/2/3/4/5/6	<ul style="list-style-type: none"> <li>• 2GR: 2</li> <li>• 3GR: 3</li> <li>• 4GR: 4</li> <li>• 5GR: 5</li> <li>• 6GR: 6</li> </ul>	SSC, SSD, SSE, SSF, SSG, THOP, TSS, VSS	N/A
LPS (Line pressure control solenoid)	A	<ul style="list-style-type: none"> <li>• D range, 1GR (idle): <b>996 mA</b></li> <li>• D range, 3GR: <b>656 mA</b></li> <li>• R position: <b>719 mA</b></li> </ul>	<p>Inspect the line pressure control solenoid.</p> <p>(See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL].</a>)</p>	1E, 1R
MNL SW (M range switch)	On/Off	<ul style="list-style-type: none"> <li>• M range: On</li> <li>• Other: Off</li> </ul>	<p>Inspect the selector lever component.</p> <p>(See <a href="#">SELECTOR LEVER COMPONENT INSPECTION.</a>)</p>	2G
OSS (Output shaft speed)	RPM	<ul style="list-style-type: none"> <li>• Vehicle speed 40 km/h { 25 mph}: <b>3,800 RPM</b></li> <li>• Indicates output shaft speed</li> </ul>	<p>Inspect the VSS.</p> <p>(See <a href="#">VEHICLE SPEED SENSOR (VSS) INSPECTION [SJ6A-EL].</a>)</p>	2C, 2D
PNP_TCM (Park/Neutral)	Drive/Neutral	<ul style="list-style-type: none"> <li>• P, N position: Neutral</li> <li>• D, M range or R position: Drive</li> </ul>	<p>Inspect the TR switch.</p> <p>(See <a href="#">TRANSMISSION RANGE (TR) SWITCH INSPECTION [SJ6A-EL].</a>)</p>	2K, 2M, 2N, 2O
RPM TCM (Engine speed)	RPM	<ul style="list-style-type: none"> <li>• Ignition switch ON: <b>0 rpm</b></li> <li>• Idle: <b>700—800 rpm</b></li> </ul>	<ul style="list-style-type: none"> <li>• Inspect the CMP sensor.</li> </ul> <p>(See <a href="#">CAMSHAFT POSITION (CMP) SENSOR INSPECTION [LF].</a>)</p> <ul style="list-style-type: none"> <li>• Inspect the PCM.</li> </ul> <p>(See <a href="#">PCM</a></p>	N/A

			INSPECTION [LF].)	
SS SW- (Steering shift switch (down switch))	On/Off	M range <ul style="list-style-type: none"> <li>Steering shift down switch on: On</li> <li>Other: Off</li> </ul>	Inspect the steering shift switch. (See <b>STEERING SHIFT SWITCH INSPECTION.</b> )	2AB, 2AF
SS SW+ (Steering shift switch (up switch))	On/Off	M range <ul style="list-style-type: none"> <li>Steering shift up switch on: On</li> <li>Other: Off</li> </ul>	Inspect the steering shift switch. (See <b>STEERING SHIFT SWITCH INSPECTION.</b> )	2AB, 2AF
SSA (Shift solenoid A)	On/Off	<ul style="list-style-type: none"> <li>2GR, 3GR, 4GR, 5GR, 6GR: On</li> <li>1GR: Off</li> </ul>	Inspect the shift solenoid A. (See <b>SOLENOID VALVE INSPECTION [SJ6A-EL].</b> )	1AF
SSB (Shift solenoid B)	On/Off	<ul style="list-style-type: none"> <li>1GR, 2GR, 6GR: On</li> <li>3GR, 4GR, 5GR: Off</li> </ul>	Inspect the shift solenoid B. (See <b>SOLENOID VALVE INSPECTION [SJ6A-EL].</b> )	1AB
SSC (Shift solenoid C)	On/Off	<ul style="list-style-type: none"> <li>1GR, 2GR, 3GR: On</li> <li>4GR, 5GR, 6GR: Off</li> </ul>	Inspect the shift solenoid C. (See <b>SOLENOID VALVE INSPECTION [SJ6A-EL].</b> )	1AA
SSD (Shift solenoid D)	On/Off	<ul style="list-style-type: none"> <li>5GR, 6GR: On</li> <li>1GR, 2GR, 3GR, 4GR: Off</li> </ul>	Inspect the shift solenoid D. (See <b>SOLENOID VALVE INSPECTION [SJ6A-EL].</b> )	1S
SSE (Shift solenoid E)	On/Off	<ul style="list-style-type: none"> <li>1GR, 2GR, 3GR, 4GR: On</li> <li>5GR, 6GR: Off</li> </ul>	Inspect the shift solenoid E. (See <b>SOLENOID VALVE INSPECTION [SJ6A-EL].</b> )	1V
SSF		<ul style="list-style-type: none"> <li>5GR, 6GR: <b>996 mA</b></li> </ul>	Inspect the shift solenoid F.	

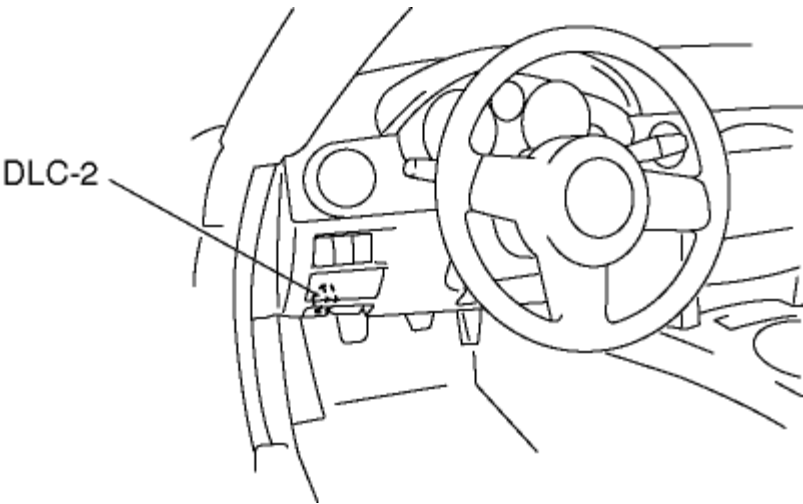
(Shift solenoid F)	A	<ul style="list-style-type: none"> <li>1GR, 2GR, 3GR, 4GR: <b>199 mA</b></li> </ul>	(See <b>SOLENOID VALVE INSPECTION [SJ6A-EL].</b> )	10, 1Z
SSG (Shift solenoid G)	A	<ul style="list-style-type: none"> <li>1GR, 2GR, 3GR, 4GR: <b>996 mA</b></li> <li>5GR, 6GR: <b>199 mA</b></li> </ul>	Inspect the shift solenoid G. (See <b>SOLENOID VALVE INSPECTION [SJ6A-EL].</b> )	1L, 1Y
TCCC (TCC solenoid valve)	A	<ul style="list-style-type: none"> <li>TCC on: <b>996 mA</b></li> <li>Other: <b>199 mA</b></li> </ul>	Inspect the TCC control solenoid. (See <b>SOLENOID VALVE INSPECTION [SJ6A-EL].</b> )	1D, 1Q
TFT (ATF temperature)	°C	<ul style="list-style-type: none"> <li>ATF temperature 20 °C { 68 °F}: <b>20 °C</b></li> <li>ATF temperature 40 °C { 104 °F}: <b>40 °C</b></li> <li>ATF temperature 60 °C { 140 °F}: <b>60 °C</b></li> </ul>	Inspect the TFT sensor. (See <b>TRANSMISSION FLUID TEMPERATURE (TFT) SENSOR INSPECTION [SJ6A-EL].</b> )	1J, 1M
TFTV (ATF temperature signal voltage)	V	<ul style="list-style-type: none"> <li>ATF temperature 20 °C { 68 °F}: <b>3 V</b></li> <li>ATF temperature 40 °C { 104 °F}: <b>2.14 V</b></li> <li>ATF temperature 60 °C { 140 °F}: <b>1.38 V</b></li> </ul>	Inspect the TFT sensor. (See <b>TRANSMISSION FLUID TEMPERATURE (TFT) SENSOR INSPECTION [SJ6A-EL].</b> )	1J, 1M
THOP (Throttle position)	%	<ul style="list-style-type: none"> <li>CTP: <b>20%</b></li> <li>WOT: <b>89.8%</b></li> </ul>	<ul style="list-style-type: none"> <li>Inspect the TP sensor.</li> </ul> (See <b>THROTTLE POSITION (TP) SENSOR INSPECTION [LF].</b> )	N/A

			<ul style="list-style-type: none"> <li>Inspect the PCM.</li> </ul> <p>(See <b>PCM INSPECTION [LF].</b>)</p>	
TR (TR switch)	R/N/D/P	<ul style="list-style-type: none"> <li>R position: R</li> <li>N position: N</li> <li>D range: D</li> <li>P position: P</li> </ul>	<p>Inspect the TR switch.</p> <p>(See <b>TRANSMISSION RANGE (TR) SWITCH INSPECTION [SJ6A-EL].</b>)</p>	2K, 2M, 2N, 2O
TRD (TR switch [D range])	On/Off	<ul style="list-style-type: none"> <li>D range: On</li> <li>Other ranges and all positions: Off</li> </ul>	<p>Inspect the TR switch.</p> <p>(See <b>TRANSMISSION RANGE (TR) SWITCH INSPECTION [SJ6A-EL].</b>)</p>	2K
TRR (TR switch [R position])	On/Off	<ul style="list-style-type: none"> <li>R position: On</li> <li>Other positions and all ranges: Off</li> </ul>	<p>Inspect the TR switch.</p> <p>(See <b>TRANSMISSION RANGE (TR) SWITCH INSPECTION [SJ6A-EL].</b>)</p>	2M
TSS (Turbine shaft speed)	RPM	<ul style="list-style-type: none"> <li>Idle: <b>700—800 rpm</b></li> <li>Vehicle speed 40 km/h { 25 mph}: <b>3,800 RPM</b></li> </ul>	<p>Inspect the turbine sensor.</p> <p>(See <b>TURBINE SENSOR INSPECTION [SJ6A-EL].</b>)</p>	2A, 2B
UP SW (Up switch)	On/Off	<ul style="list-style-type: none"> <li>Up shift at M range: On</li> <li>Other: Off</li> </ul>	<p>Inspect the selector lever component.</p> <p>(See <b>SELECTOR LEVER COMPONENT INSPECTION.</b>)</p>	2J
VPWR_TCM (Battery voltage)	V	Ignition switch at ON position: B+	<ul style="list-style-type: none"> <li>Inspect the ignition switch.</li> </ul> <p>(See <b>IGNITION SWITCH INSPECTION.</b>)</p> <ul style="list-style-type: none"> <li>Inspect the battery.</li> </ul>	1AD

			(See <b>BATTERY INSPECTION [LF].</b> )	
VSS (Vehicle speed)	KPH	<ul style="list-style-type: none"><li>Vehicle speed 40 km/h { 25 mph}: <b>40 KPH</b></li><li>Indicates vehicle speed</li></ul>	Inspect the VSS.  (See <b>VEHICLE SPEED SENSOR (VSS) INSPECTION [SJ6A-EL].</b> )	2C, 2D

**Simulation Function Procedure**

- 1. Connect the M-MDS to the DLC-2.



- 2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.
  - When using the IDS (laptop PC)
    - 1. Select "DataLogger".
    - 2. Select "Modules".
    - 3. Select "TCM".
  - When using the PDS (Pocket PC)
    - 1. Select "Module Tests".
    - 2. Select "TCM".
    - 3. Select "DataLogger".
- 3. Select the active command modes from the PID table.
- 4. Perform the active command modes, inspect the operations for each parts.
  - If the operation of output parts cannot be verified after the active command



mode inspection is performed, this could indicate the possibility of an open or short circuit, sticking, or operation malfunction in the output parts.

**Simulation item tableX:** Available

Simulation item	Applicable component	Unit/Condition	Operation		TCM terminal
			IG ON	Idle	
LPS	Pressure control solenoid control signal in TCM	A	N/A	X	1E, 1R
SSA	Shift solenoid A	On/Off	N/A	X	1AF
SSB	Shift solenoid B	On/Off	N/A	X	1AB
SSC	Shift solenoid C	On/Off	N/A	X	1AA
SSD	Shift solenoid D	On/Off	N/A	X	1S
SSE	Shift solenoid E	On/Off	N/A	X	1V
SSF	Shift solenoid F	A	N/A	X	1O, 1Z
SSG	Shift solenoid G	A	N/A	X	1L, 1Y
TCCC	TCC solenoid valve	A	N/A	X	1D, 1Q

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## 2008 - MX-5 - Transmission/Transaxle

### DTC P0751 [SJ6A-EL]

DTC P0751	Shift solenoid A malfunction (stuck off)
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>TCM detects that shift solenoid A does not change from off when engine is running</li> </ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"> <li>MIL illuminates if TCM detects the above malfunction conditions in two consecutive drive cycles.</li> <li>PENDING CODE is available.</li> <li>FREEZE FRAME DATA is available.</li> <li>The AT warning light illuminates.</li> <li>DTC is stored in TCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>ATF level low</li> <li>Deteriorated ATF</li> <li>Line pressure low</li> <li>Shift solenoid A stuck off</li> <li>Control valve body malfunction</li> <li>TCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins</li> </ul>	Yes Perform repair or diagnosis according to the available repair information.

	<p>and/or on-line repair information availability.</p> <ul style="list-style-type: none"> <li>Is any related repair information available?</li> </ul>		<ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<p><b>INSPECT FOR DTC</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (engine off).</li> <li>Inspect for DTCs.</li> <li>Are any other DTCs output?</li> </ul>	Yes	Follow the applicable DTC inspection procedure, then go to the next step. (See <a href="#">DTC TABLE [SJ6A-EL]</a> .)
		No	Go to the next step.
4	<p><b>INSPECT ATF CONDITION</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Inspect ATF condition. <ul style="list-style-type: none"> <li>Transparent red: Normal</li> <li>Milky: Water mixed in fluid</li> <li>Reddish brown: Deteriorated ATF</li> </ul> </li> <li>Is it normal?</li> </ul> <p>(See <a href="#">AUTOMATIC TRANSMISSION FLUID (ATF) INSPECTION [SJ6A-EL]</a>.)</p>	Yes	Go to the next step.
		No	If the ATF color milky or reddish brown, repair or replace AT, then go to Step 7.
5	<p><b>INSPECT ATF LEVEL</b></p> <ul style="list-style-type: none"> <li>Start the engine.</li> <li>Warm up the AT.</li> <li>Is the ATF level within the specification?</li> </ul> <p>(See <a href="#">AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT [SJ6A-EL]</a>.)</p>	Yes	Go to the next step.
		No	<p>Add ATF to the specified level, then go to Step 7.</p> <p>(See <a href="#">AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT [SJ6A-EL]</a>.)</p>
6	<p><b>INSPECT LINE PRESSURE</b></p> <ul style="list-style-type: none"> <li>Start the engine.</li> <li>Measure the line pressure.</li> </ul> <p>(See <a href="#">MECHANICAL SYSTEM TEST [SJ6A-EL]</a>.)</p> <ul style="list-style-type: none"> <li>Are the line pressures within the</li> </ul>	Yes	Go to the next step.
		No	<ul style="list-style-type: none"> <li>All ranges: Replace the oil pump or control valve body, then go to the next step.</li> <li>Any ranges: Replace the AT, then go to the next step.</li> </ul>

	specifications?		(See <b>AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL].</b> )
7	<b>VERIFY TROUBLESHOOTING OF DTC P0751 COMPLETED</b> <ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Clear the DTC from the TCM memory using the M-MDS.</li><li>• Start the engine.</li><li>• Warm up AT.</li><li>• Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 6GR.</li><li>• Is PENDING CODE for this the DTC present?</li></ul>	Yes	Replace the TCM, then go to the next step.  (See <b>TCM REMOVAL/INSTALLATION [SJ6A-EL].</b> )
		No	Go to the next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "After Repair Procedure".  (See <b>AFTER REPAIR PROCEDURE [SJ6A-EL].</b>)</li><li>• Are any DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection.  (See <b>DTC TABLE [SJ6A-EL].</b> )
		No	DTC troubleshooting completed.

## 2008 - MX-5 - Transmission/Transaxle

### DTC P0752 [SJ6A-EL]

DTC P0752	Shift solenoid A malfunction (stuck on)
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>TCM detects that shift solenoid A does not change from on when engine is running</li> </ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"> <li>MIL illuminates if TCM detects the above malfunction conditions in two consecutive drive cycles.</li> <li>PENDING CODE is available.</li> <li>FREEZE FRAME DATA is available.</li> <li>The AT warning light illuminates.</li> <li>DTC is stored in TCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>ATF level low</li> <li>Deteriorated ATF</li> <li>Line pressure low</li> <li>Shift solenoid A stuck on</li> <li>Control valve body malfunction</li> <li>TCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins</li> </ul>	Yes Perform repair or diagnosis according to the available repair information.

	<p>and/or on-line repair information availability.</p> <ul style="list-style-type: none"><li>Is any related repair information available?</li></ul>		<ul style="list-style-type: none"><li>If the vehicle is not repaired, go to the next step.</li></ul>
		No	Go to the next step.
3	<b>INSPECT FOR DTC</b> <ul style="list-style-type: none"><li>Turn the ignition switch to the ON position (engine off).</li><li>Inspect for DTCs.</li><li>Are any other DTCs output?</li></ul>	Yes	Follow the applicable DTC inspection procedure, then go to the next step. (See <b>DTC TABLE [SJ6A-EL].</b> )
		No	Go to the next step.
4	<b>INSPECT ATF CONDITION</b> <ul style="list-style-type: none"><li>Turn the ignition switch to the LOCK position.</li><li>Inspect ATF condition.<ul style="list-style-type: none"><li>Transparent red: Normal</li><li>Milky: Water mixed in fluid</li><li>Reddish brown: Deteriorated ATF</li></ul></li><li>Is it normal?</li></ul> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) INSPECTION[SJ6A-EL].</b>)</p>	Yes	Go to the next step.
		No	If the ATF color milky or reddish brown, repair or replace AT, then go to Step 7.
5	<b>INSPECT ATF LEVEL</b> <ul style="list-style-type: none"><li>Start the engine.</li><li>Warm up the AT.</li><li>Is the ATF level within the specification?</li></ul> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT [SJ6A-EL].</b>)</p>	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7.  (See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT [SJ6A-EL].</b> )
6	<b>INSPECT LINE PRESSURE</b> <ul style="list-style-type: none"><li>Start the engine.</li><li>Measure the line pressure.</li></ul> <p>(See <b>MECHANICAL SYSTEM TEST[SJ6A-EL].</b>)</p> <ul style="list-style-type: none"><li>Are the line pressures within the</li></ul>	Yes	Go to the next step.
		No	<ul style="list-style-type: none"><li>All ranges: Replace the oil pump or control valve body, then go to the next step.</li><li>Any ranges: Replace the AT, then go to the next step.</li></ul>

	specifications?		(See <b>AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL].</b> )
7	<b>VERIFY TROUBLESHOOTING OF DTC P0752 COMPLETED</b> <ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Clear the DTC from the TCM memory using the M-MDS.</li><li>• Start the engine.</li><li>• Warm up AT.</li><li>• Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 6GR.</li><li>• Is PENDING CODE for this the DTC present?</li></ul>	Yes	Replace the TCM, then go to the next step.  (See <b>TCM REMOVAL/INSTALLATION [SJ6A-EL].</b> )
		No	Go to the next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "After Repair Procedure".  (See <b>AFTER REPAIR PROCEDURE [SJ6A-EL].</b>)</li><li>• Are any DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection.  (See <b>DTC TABLE [SJ6A-EL].</b> )
		No	DTC troubleshooting completed.

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### DTC P0756 [SJ6A-EL]

DTC P0756	Shift solenoid B malfunction (stuck off)
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>TCM detects that shift solenoid B does not change from off when engine is running</li> </ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"> <li>MIL illuminates if TCM detects the above malfunction conditions in two consecutive drive cycles.</li> <li>PENDING CODE is available.</li> <li>FREEZE FRAME DATA is available.</li> <li>The AT warning light illuminates.</li> <li>DTC is stored in TCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>ATF level low</li> <li>Deteriorated ATF</li> <li>Line pressure low</li> <li>Shift solenoid B stuck off</li> <li>Control valve body malfunction</li> <li>TCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins</li> </ul>	Yes Perform repair or diagnosis according to the available repair information.



	<p>and/or on-line repair information availability.</p> <ul style="list-style-type: none"> <li>Is any related repair information available?</li> </ul>		<ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<p><b>INSPECT FOR DTC</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (engine off).</li> <li>Inspect for DTCs.</li> <li>Are any other DTCs output?</li> </ul>	Yes	Follow the applicable DTC inspection procedure, then go to the next step. (See <b>DTC TABLE [SJ6A-EL].</b> )
		No	Go to the next step.
4	<p><b>INSPECT ATF CONDITION</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Inspect ATF condition. <ul style="list-style-type: none"> <li>Transparent red: Normal</li> <li>Milky: Water mixed in fluid</li> <li>Reddish brown: Deteriorated ATF</li> </ul> </li> <li>Is it normal?</li> </ul> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) INSPECTION[SJ6A-EL].</b>)</p>	Yes	Go to the next step.
		No	If the ATF color milky or reddish brown, repair or replace AT, then go to Step 7.
5	<p><b>INSPECT ATF LEVEL</b></p> <ul style="list-style-type: none"> <li>Start the engine.</li> <li>Warm up the AT.</li> <li>Is the ATF level within the specification?</li> </ul> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT [SJ6A-EL].</b>)</p>	Yes	Go to the next step.
		No	<p>Add ATF to the specified level, then go to Step 7.</p> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT [SJ6A-EL].</b>)</p>
6	<p><b>INSPECT LINE PRESSURE</b></p> <ul style="list-style-type: none"> <li>Start the engine.</li> <li>Measure the line pressure.</li> </ul> <p>(See <b>MECHANICAL SYSTEM TEST[SJ6A-EL].</b>)</p> <ul style="list-style-type: none"> <li>Are the line pressures within the</li> </ul>	Yes	Go to the next step.
		No	<ul style="list-style-type: none"> <li>All ranges: Replace the oil pump or control valve body, then go to the next step.</li> <li>Any ranges: Replace the AT, then go to the next step.</li> </ul>

	specifications?		(See <b>AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL].</b> )
7	<b>VERIFY TROUBLESHOOTING OF DTC P0756 COMPLETED</b> <ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Clear the DTC from the TCM memory using the M-MDS.</li><li>• Start the engine.</li><li>• Warm up AT.</li><li>• Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 6GR.</li><li>• Is PENDING CODE for this the DTC present?</li></ul>	Yes	Replace the TCM, then go to the next step.  (See <b>TCM REMOVAL/INSTALLATION [SJ6A-EL].</b> )
		No	Go to the next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "After Repair Procedure".  (See <b>AFTER REPAIR PROCEDURE [SJ6A-EL].</b>)</li><li>• Are any DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection.  (See <b>DTC TABLE [SJ6A-EL].</b> )
		No	DTC troubleshooting completed.

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### DTC P0757 [SJ6A-EL]

DTC P0757	Shift solenoid B malfunction (stuck on)
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>TCM detects that shift solenoid B does not change from on when engine is running</li> </ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"> <li>MIL illuminates if TCM detects the above malfunction conditions in two consecutive drive cycles.</li> <li>PENDING CODE is available.</li> <li>FREEZE FRAME DATA is available.</li> <li>The AT warning light illuminates.</li> <li>DTC is stored in TCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>ATF level low</li> <li>Deteriorated ATF</li> <li>Line pressure low</li> <li>Shift solenoid B stuck on</li> <li>Control valve body malfunction</li> <li>TCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins</li> </ul>	Yes Perform repair or diagnosis according to the available repair information.

	<p>and/or on-line repair information availability.</p> <ul style="list-style-type: none"><li>Is any related repair information available?</li></ul>		<ul style="list-style-type: none"><li>If the vehicle is not repaired, go to the next step.</li></ul>
		No	Go to the next step.
3	<b>INSPECT FOR DTC</b> <ul style="list-style-type: none"><li>Turn the ignition switch to the ON position (engine off).</li><li>Inspect for DTCs.</li><li>Are any other DTCs output?</li></ul>	Yes	Follow the applicable DTC inspection procedure, then go to the next step. (See <b>DTC TABLE [SJ6A-EL].</b> )
		No	Go to the next step.
4	<b>INSPECT ATF CONDITION</b> <ul style="list-style-type: none"><li>Turn the ignition switch to the LOCK position.</li><li>Inspect ATF condition.<ul style="list-style-type: none"><li>Transparent red: Normal</li><li>Milky: Water mixed in fluid</li><li>Reddish brown: Deteriorated ATF</li></ul></li><li>Is it normal?</li></ul> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) INSPECTION[SJ6A-EL].</b>)</p>	Yes	Go to the next step.
		No	If the ATF color milky or reddish brown, repair or replace AT, then go to Step 7.
5	<b>INSPECT ATF LEVEL</b> <ul style="list-style-type: none"><li>Start the engine.</li><li>Warm up the AT.</li><li>Is the ATF level within the specification?</li></ul> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT [SJ6A-EL].</b>)</p>	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7.  (See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT [SJ6A-EL].</b> )
6	<b>INSPECT LINE PRESSURE</b> <ul style="list-style-type: none"><li>Start the engine.</li><li>Measure the line pressure.</li></ul> <p>(See <b>MECHANICAL SYSTEM TEST[SJ6A-EL].</b>)</p> <ul style="list-style-type: none"><li>Are the line pressures within the</li></ul>	Yes	Go to the next step.
		No	<ul style="list-style-type: none"><li>All ranges: Replace the oil pump or control valve body, then go to the next step.</li><li>Any ranges: Replace the AT, then go to the next step.</li></ul>

	specifications?		(See <b>AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL].</b> )
7	<b>VERIFY TROUBLESHOOTING OF DTC P0757 COMPLETED</b> <ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Clear the DTC from the TCM memory using the M-MDS.</li><li>• Start the engine.</li><li>• Warm up AT.</li><li>• Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 6GR.</li><li>• Is PENDING CODE for this the DTC present?</li></ul>	Yes	Replace the TCM, then go to the next step.  (See <b>TCM REMOVAL/INSTALLATION [SJ6A-EL].</b> )
		No	Go to the next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "After Repair Procedure".  (See <b>AFTER REPAIR PROCEDURE [SJ6A-EL].</b>)</li><li>• Are any DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection.  (See <b>DTC TABLE [SJ6A-EL].</b> )
		No	DTC troubleshooting completed.

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### DTC P0761 [SJ6A-EL]

DTC P0761	Shift solenoid C malfunction (stuck off)
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>TCM detects that shift solenoid C does not change from off when engine is running</li> </ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"> <li>MIL illuminates if TCM detects the above malfunction conditions in two consecutive drive cycles.</li> <li>PENDING CODE is available.</li> <li>FREEZE FRAME DATA is available.</li> <li>The AT warning light illuminates.</li> <li>DTC is stored in TCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>ATF level low</li> <li>Deteriorated ATF</li> <li>Line pressure low</li> <li>Shift solenoid C stuck off</li> <li>Control valve body malfunction</li> <li>TCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins</li> </ul>	Yes Perform repair or diagnosis according to the available repair information.

	<p>and/or on-line repair information availability.</p> <ul style="list-style-type: none"> <li>Is any related repair information available?</li> </ul>		<ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<p><b>INSPECT FOR DTC</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (engine off).</li> <li>Inspect for DTCs.</li> <li>Are any other DTCs output?</li> </ul>	Yes	Follow the applicable DTC inspection procedure, then go to the next step. (See <b>DTC TABLE [SJ6A-EL]</b> .)
		No	Go to the next step.
4	<p><b>INSPECT ATF CONDITION</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Inspect ATF condition. <ul style="list-style-type: none"> <li>Transparent red: Normal</li> <li>Milky: Water mixed in fluid</li> <li>Reddish brown: Deteriorated ATF</li> </ul> </li> <li>Is it normal?</li> </ul> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) INSPECTION[SJ6A-EL]</b>.)</p>	Yes	Go to the next step.
		No	If the ATF color milky or reddish brown, repair or replace AT, then go to Step 7.
5	<p><b>INSPECT ATF LEVEL</b></p> <ul style="list-style-type: none"> <li>Start the engine.</li> <li>Warm up the AT.</li> <li>Is the ATF level within the specification?</li> </ul> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT [SJ6A-EL]</b>.)</p>	Yes	Go to the next step.
		No	<p>Add ATF to the specified level, then go to Step 7.</p> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT [SJ6A-EL]</b>.)</p>
6	<p><b>INSPECT LINE PRESSURE</b></p> <ul style="list-style-type: none"> <li>Start the engine.</li> <li>Measure the line pressure.</li> </ul> <p>(See <b>MECHANICAL SYSTEM TEST[SJ6A-EL]</b>.)</p> <ul style="list-style-type: none"> <li>Are the line pressures within the</li> </ul>	Yes	Go to the next step.
		No	<ul style="list-style-type: none"> <li>All ranges: Replace the oil pump or control valve body, then go to the next step.</li> <li>Any ranges: Replace the AT, then go to the next step.</li> </ul>

	specifications?		(See <b>AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL].</b> )
7	<b>VERIFY TROUBLESHOOTING OF DTC P0761 COMPLETED</b> <ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Clear the DTC from the TCM memory using the M-MDS.</li><li>• Start the engine.</li><li>• Warm up AT.</li><li>• Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 6GR.</li><li>• Is PENDING CODE for this the DTC present?</li></ul>	Yes	Replace the TCM, then go to the next step.  (See <b>TCM REMOVAL/INSTALLATION [SJ6A-EL].</b> )
		No	Go to the next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "After Repair Procedure".</li></ul> (See <b>AFTER REPAIR PROCEDURE [SJ6A-EL].</b> ) <ul style="list-style-type: none"><li>• Are any DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection.  (See <b>DTC TABLE [SJ6A-EL].</b> )
		No	DTC troubleshooting completed.



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### DTC P0762 [SJ6A-EL]

DTC P0762	Shift solenoid C malfunction (stuck on)
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>TCM detects that shift solenoid C does not change from on when engine is running</li> </ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"> <li>MIL illuminates if TCM detects the above malfunction conditions in two consecutive drive cycles.</li> <li>PENDING CODE is available.</li> <li>FREEZE FRAME DATA is available.</li> <li>The AT warning light illuminates.</li> <li>DTC is stored in TCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>ATF level low</li> <li>Deteriorated ATF</li> <li>Line pressure low</li> <li>Shift solenoid C stuck on</li> <li>Control valve body malfunction</li> <li>TCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins</li> </ul>	Yes Perform repair or diagnosis according to the available repair information.

	<p>and/or on-line repair information availability.</p> <ul style="list-style-type: none"><li>Is any related repair information available?</li></ul>		<ul style="list-style-type: none"><li>If the vehicle is not repaired, go to the next step.</li></ul>
		No	Go to the next step.
3	<b>INSPECT FOR DTC</b> <ul style="list-style-type: none"><li>Turn the ignition switch to the ON position (engine off).</li><li>Inspect for DTCs.</li><li>Are any other DTCs output?</li></ul>	Yes	Follow the applicable DTC inspection procedure, then go to the next step. (See <b>DTC TABLE [SJ6A-EL].</b> )
		No	Go to the next step.
4	<b>INSPECT ATF CONDITION</b> <ul style="list-style-type: none"><li>Turn the ignition switch to the LOCK position.</li><li>Inspect ATF condition.<ul style="list-style-type: none"><li>Transparent red: Normal</li><li>Milky: Water mixed in fluid</li><li>Reddish brown: Deteriorated ATF</li></ul></li><li>Is it normal?</li></ul> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) INSPECTION[SJ6A-EL].</b>)</p>	Yes	Go to the next step.
		No	If the ATF color milky or reddish brown, repair or replace AT, then go to Step 7.
5	<b>INSPECT ATF LEVEL</b> <ul style="list-style-type: none"><li>Start the engine.</li><li>Warm up the AT.</li><li>Is the ATF level within the specification?</li></ul> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT [SJ6A-EL].</b>)</p>	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7.  (See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT [SJ6A-EL].</b> )
6	<b>INSPECT LINE PRESSURE</b> <ul style="list-style-type: none"><li>Start the engine.</li><li>Measure the line pressure.</li></ul> <p>(See <b>MECHANICAL SYSTEM TEST[SJ6A-EL].</b>)</p> <ul style="list-style-type: none"><li>Are the line pressures within the</li></ul>	Yes	Go to the next step.
		No	<ul style="list-style-type: none"><li>All ranges: Replace the oil pump or control valve body, then go to the next step.</li><li>Any ranges: Replace the AT, then go to the next step.</li></ul>

	specifications?		(See <b>AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL].</b> )
7	<b>VERIFY TROUBLESHOOTING OF DTC P0762 COMPLETED</b> <ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Clear the DTC from the TCM memory using the M-MDS.</li><li>• Start the engine.</li><li>• Warm up AT.</li><li>• Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 6GR.</li><li>• Is PENDING CODE for this the DTC present?</li></ul>	Yes	Replace the TCM, then go to the next step.  (See <b>TCM REMOVAL/INSTALLATION [SJ6A-EL].</b> )
		No	Go to the next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "After Repair Procedure".</li></ul> (See <b>AFTER REPAIR PROCEDURE [SJ6A-EL].</b> ) <ul style="list-style-type: none"><li>• Are any DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection.  (See <b>DTC TABLE [SJ6A-EL].</b> )
		No	DTC troubleshooting completed.

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### DTC P0766 [SJ6A-EL]

DTC P0766	Shift solenoid D malfunction (stuck off)
	Shift solenoid G malfunction (stuck on)
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>• TCM detects that shift solenoid D does not change from off when engine is running</li> <li>• TCM detects that shift solenoid G does not change from on when engine is running</li> </ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"> <li>• MIL illuminates if TCM detects the above malfunction conditions in two consecutive drive cycles.</li> <li>• PENDING CODE is available.</li> <li>• FREEZE FRAME DATA is available.</li> <li>• The AT warning light illuminates.</li> <li>• DTC is stored in TCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• ATF level low</li> <li>• Deteriorated ATF</li> <li>• Line pressure low</li> <li>• Shift solenoid D stuck off</li> <li>• Shift solenoid G stuck on</li> <li>• Control valve body malfunction</li> <li>• TCM malfunction</li> </ul>

### Diagnostic procedure

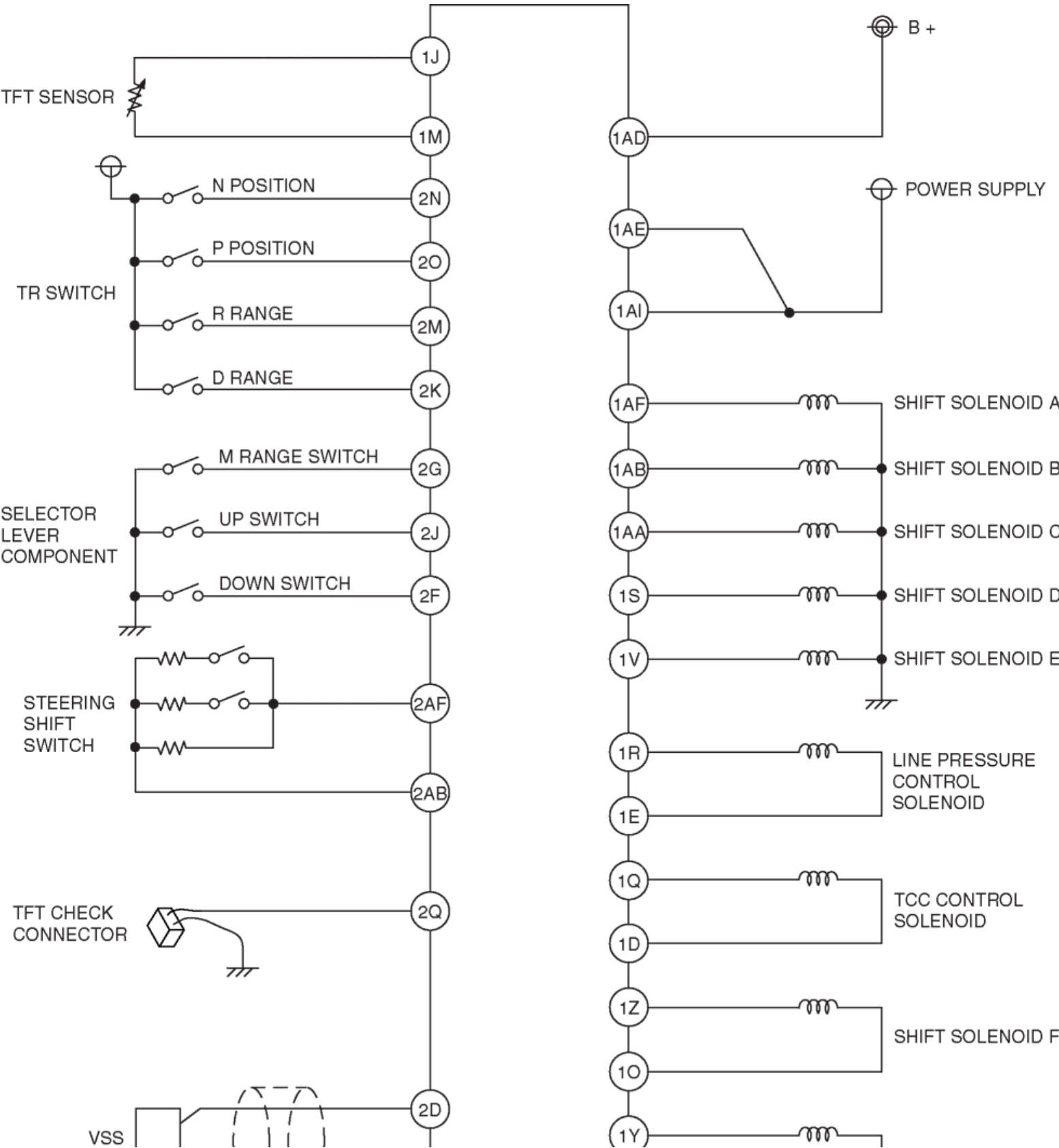
STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	YesGo to the next step.

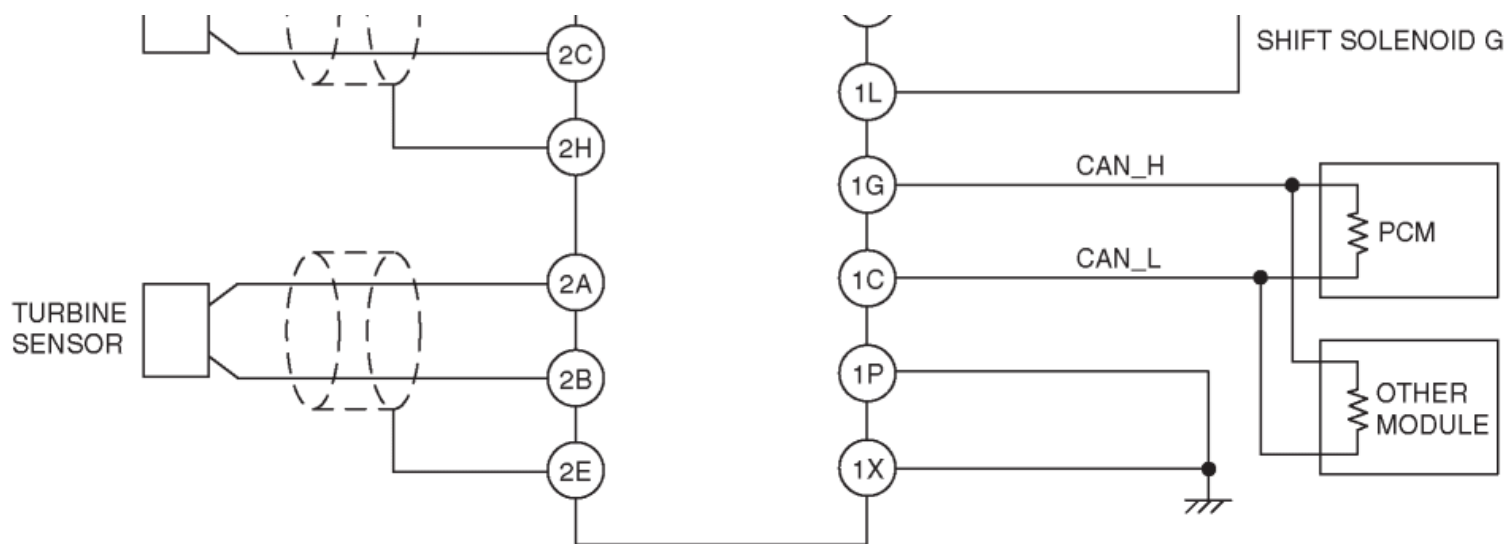
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes	Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<b>INSPECT FOR DTC</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (engine off).</li> <li>Inspect for DTCs.</li> <li>Are any other DTCs output?</li> </ul>	Yes	Follow the applicable DTC inspection procedure, then go to the next step. (See <b>DTC TABLE [SJ6A-EL]</b> .)
		No	Go to the next step.
4	<b>INSPECT ATF CONDITION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Inspect ATF condition.               <ul style="list-style-type: none"> <li>Transparent red: Normal</li> <li>Milky: Water mixed in fluid</li> <li>Reddish brown: Deteriorated ATF</li> </ul> </li> <li>Is it normal?</li> </ul> (See <b>AUTOMATIC TRANSMISSION FLUID (ATF) INSPECTION [SJ6A-EL]</b> .)	Yes	Go to the next step.
		No	If the ATF color milky or reddish brown, repair or replace AT, then go to Step 7.
5	<b>INSPECT ATF LEVEL</b> <ul style="list-style-type: none"> <li>Start the engine.</li> <li>Warm up the AT.</li> <li>Is the ATF level within the specification?</li> </ul> (See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT [SJ6A-EL]</b> .)	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7.  (See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT [SJ6A-EL]</b> .)
6	<b>INSPECT LINE PRESSURE</b> <ul style="list-style-type: none"> <li>Start the engine.</li> </ul>	Yes	Go to the next step.

	<ul style="list-style-type: none"><li>• Measure the line pressure.  (See <b>MECHANICAL SYSTEM TEST</b>[SJ6A-EL].)</li><li>• Are the line pressures within the specifications?</li></ul>	No	<ul style="list-style-type: none"><li>• All ranges: Replace the oil pump or control valve body, then go to the next step.</li><li>• Any ranges: Replace the AT, then go to the next step.  (See <b>AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION</b> [SJ6A-EL].)</li></ul>
7	<b>VERIFY TROUBLESHOOTING OF DTC P0766 COMPLETED</b> <ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Clear the DTC from the TCM memory using the M-MDS.</li><li>• Start the engine.</li><li>• Warm up AT.</li><li>• Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 6GR.</li><li>• Is PENDING CODE for this the DTC present?</li></ul>	Yes	Replace the TCM, then go to the next step.  (See <b>TCM REMOVAL/INSTALLATION</b> [SJ6A-EL].)
		No	Go to the next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "After Repair Procedure".  (See <b>AFTER REPAIR PROCEDURE</b> [SJ6A-EL].)</li><li>• Are any DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection.  (See <b>DTC TABLE</b> [SJ6A-EL].)
		No	DTC troubleshooting completed.

2008 - MX-5 - Transmission/Transaxle

AUTOMATIC TRANSMISSION CONTROL SYSTEM WIRING DIAGRAM [SJ6A-EL]





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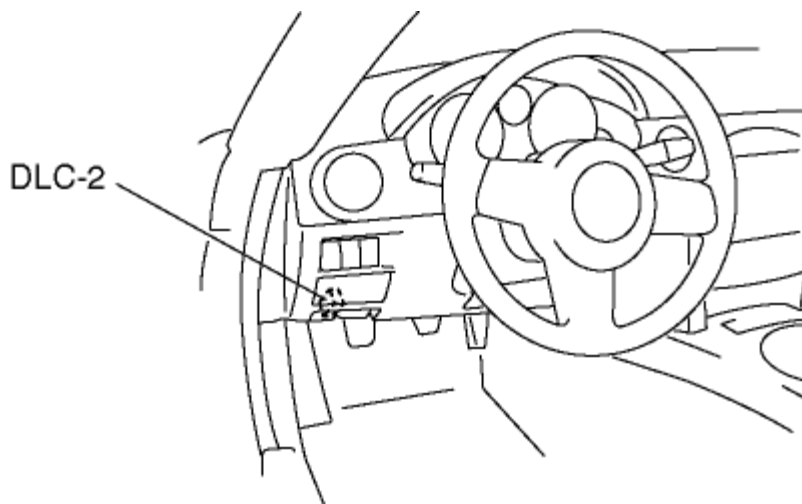


## 2008 - MX-5 - Transmission/Transaxle

### AUTOMATIC TRANSMISSION ON-BOARD DIAGNOSTIC FUNCTION [SJ6A-EL]

#### DTC Reading Procedure

1. Connect the M-MDS to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  1. Select "Self Test".
  2. Select "Modules".
  3. Select "TCM".
- When using the PDS (Pocket PC)
  1. Select "Module Tests".
  2. Select "TCM".
  3. Select "Self Test".

3. Verify the DTC according to the directions on the screen.

- If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.

4. After completion of repairs, clear all DTCs stored in the TCM. (See [AFTER REPAIR PROCEDURE\[SJ6A-EL\]](#).)



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### DTC P0781 [SJ6A-EL]

DTC P0781	1-2 shift valve malfunction
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>TCM detects 1–2 shift valve malfunction.</li> </ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"> <li>The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available.</li> <li>FREEZE FRAME DATA is available.</li> <li>The AT warning light illuminates.</li> <li>DTC is stored in TCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>ATF level low</li> <li>Deteriorated ATF</li> <li>Line pressure low</li> <li>Stuck 1–2 shift valve</li> <li>Control valve body malfunction</li> <li>TCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired,</li> </ul>

	availability.		go to the next step.
	<ul style="list-style-type: none"><li>Is any related repair information available?</li></ul>	No	Go to the next step.
3	<b>INSPECT FOR DTC</b> <ul style="list-style-type: none"><li>Turn the ignition switch to the ON position (engine off).</li><li>Inspect for DTCs.</li><li>Are any other DTCs output?</li></ul>	Yes	Follow the applicable DTC inspection procedure, then go to the next step. (See <b>DTC TABLE [SJ6A-EL].</b> )
		No	Go to the next step.
4	<b>INSPECT ATF CONDITION</b> <ul style="list-style-type: none"><li>Turn the ignition switch to the LOCK position.</li><li>Inspect ATF condition.<ul style="list-style-type: none"><li>Transparent red: Normal</li><li>Milky: Water mixed in fluid</li><li>Reddish brown: Deteriorated ATF</li></ul></li><li>Is it normal?</li></ul> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) INSPECTION[SJ6A-EL].</b>)</p>	Yes	Go to the next step.
		No	If the ATF color milky or reddish brown, repair or replace AT, then go to Step 7.
5	<b>INSPECT ATF LEVEL</b> <ul style="list-style-type: none"><li>Start the engine.</li><li>Warm up the AT.</li><li>Is the ATF level within the specification?</li></ul> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT [SJ6A-EL].</b>)</p>	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 7.  (See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT [SJ6A-EL].</b> )
6	<b>INSPECT LINE PRESSURE</b> <ul style="list-style-type: none"><li>Start the engine.</li><li>Measure the line pressure.</li></ul> <p>(See <b>MECHANICAL SYSTEM TEST[SJ6A-EL].</b>)</p> <ul style="list-style-type: none"><li>Are the line pressures within the specifications?</li></ul>	Yes	Go to the next step.
		No	<ul style="list-style-type: none"><li>All ranges: Replace the oil pump or control valve body, then go to the next step.</li><li>Any ranges: Replace the AT, then go to the next step.</li></ul> <p>(See <b>AUTOMATIC</b></p>

			<b>TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL].)</b>
7	<b>VERIFY TROUBLESHOOTING OF DTC P0781 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all disconnected connectors.</li> <li>• Clear the DTC from the TCM memory using the M-MDS.</li> <li>• Start the engine.</li> <li>• Warm up AT.</li> <li>• Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 6GR.</li> <li>• Is PENDING CODE for this the DTC present?</li> </ul>	Yes	Replace the TCM, then go to the next step.  (See <b>TCM REMOVAL/INSTALLATION [SJ6A-EL].)</b>
		No	Go to the next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform the “After Repair Procedure”.</li> </ul> (See <b>AFTER REPAIR PROCEDURE [SJ6A-EL].)</b> <ul style="list-style-type: none"> <li>• Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection.  (See <b>DTC TABLE [SJ6A-EL].)</b>
		No	DTC troubleshooting completed.

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### DTC P0813 [SJ6A-EL]

DTC P0813	Reverse sequence valve malfunction
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>TCM detects reverse sequence valve malfunction.</li> </ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"> <li>The MIL illuminates if the PCM detects the above malfunction condition in two consecutive drive cycles.</li> <li>PENDING CODE is available.</li> <li>FREEZE FRAME DATA is available.</li> <li>The AT warning light illuminates.</li> <li>DTC is stored in TCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>ATF level low</li> <li>Deteriorated ATF</li> <li>Line pressure low</li> <li>Stuck reverse sequence valve</li> <li>Control valve body malfunction</li> <li>TCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b>	Yes Go to the next step.
	<ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b>	Yes Perform repair or diagnosis according to the available repair information.
	<ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information</li> </ul>	<ul style="list-style-type: none"> <li>If the vehicle is not repaired,</li> </ul>

	<p>availability.</p> <ul style="list-style-type: none"> <li>Is any related repair information available?</li> </ul>		<p>go to the next step.</p>
3	<p><b>INSPECT FOR DTC</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (engine off).</li> <li>Inspect for DTCs.</li> <li>Are any other DTCs output?</li> </ul>	<p>Yes</p>	<p>Follow the applicable DTC inspection procedure, then go to the next step. (See <b>DTC TABLE [SJ6A-EL].</b>)</p>
		<p>No</p>	<p>Go to the next step.</p>
4	<p><b>INSPECT ATF CONDITION</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Inspect ATF condition. <ul style="list-style-type: none"> <li>Transparent red: Normal</li> <li>Milky: Water mixed in fluid</li> <li>Reddish brown: Deteriorated ATF</li> </ul> </li> <li>Is it normal?</li> </ul> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) INSPECTION[SJ6A-EL].</b>)</p>	<p>Yes</p>	<p>Go to the next step.</p>
		<p>No</p>	<p>If the ATF color milky or reddish brown, repair or replace AT, then go to Step 7.</p>
5	<p><b>INSPECT ATF LEVEL</b></p> <ul style="list-style-type: none"> <li>Start the engine.</li> <li>Warm up the AT.</li> <li>Is the ATF level within the specification?</li> </ul> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT [SJ6A-EL].</b>)</p>	<p>Yes</p>	<p>Go to the next step.</p>
		<p>No</p>	<p>Add ATF to the specified level, then go to Step 7.</p> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT [SJ6A-EL].</b>)</p>
6	<p><b>INSPECT LINE PRESSURE</b></p> <ul style="list-style-type: none"> <li>Start the engine.</li> <li>Measure the line pressure.</li> </ul> <p>(See <b>MECHANICAL SYSTEM TEST[SJ6A-EL].</b>)</p> <ul style="list-style-type: none"> <li>Are the line pressures within the specifications?</li> </ul>	<p>Yes</p>	<p>Go to the next step.</p>
		<p>No</p>	<ul style="list-style-type: none"> <li>All ranges: Replace the oil pump or control valve body, then go to the next step.</li> <li>Any ranges: Replace the AT, then go to the next step.</li> </ul> <p>(See <b>AUTOMATIC</b></p>

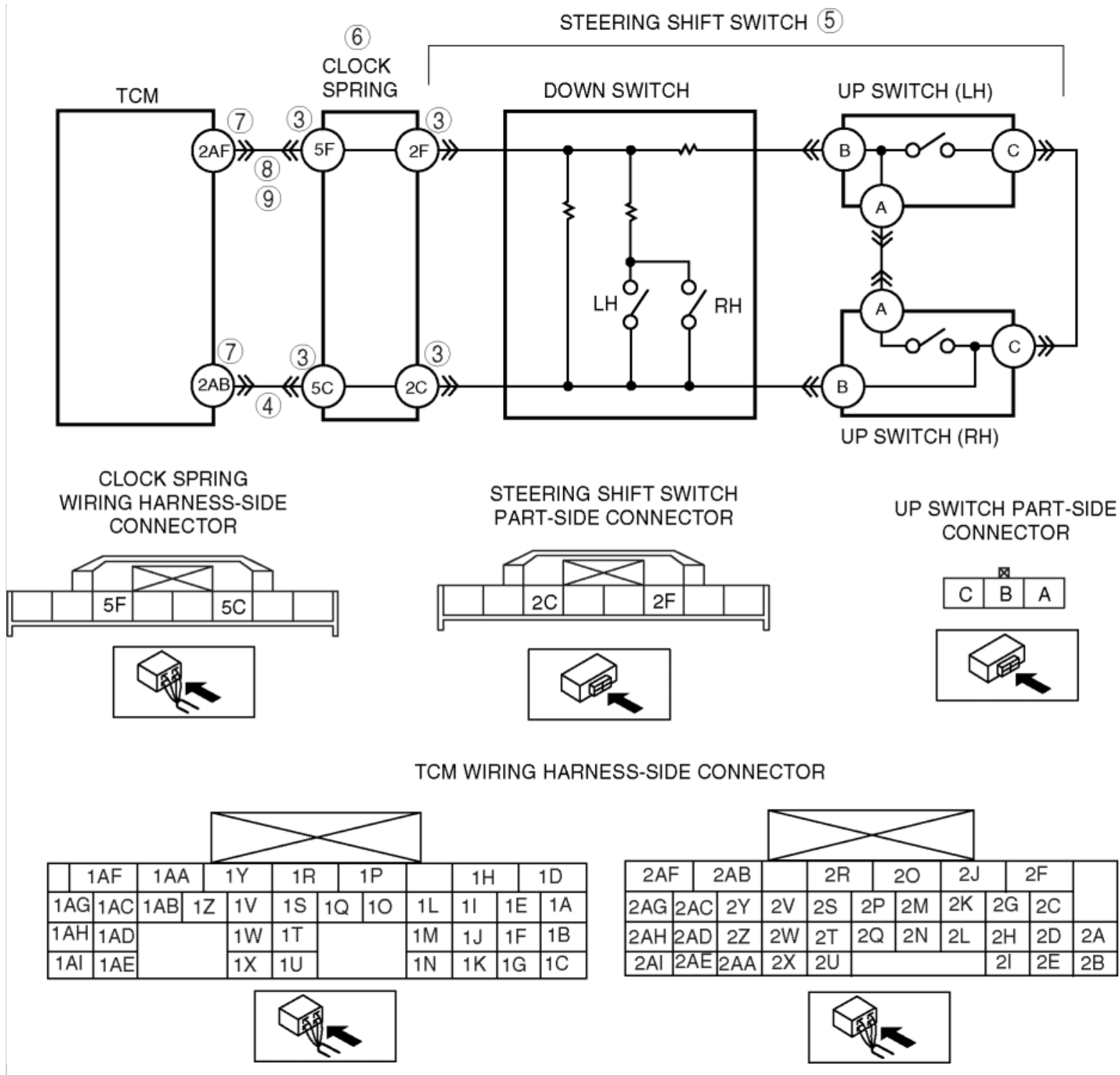
			<b>TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL].)</b>
7	<b>VERIFY TROUBLESHOOTING OF DTC P0813 COMPLETED</b> <ul style="list-style-type: none"><li>• Make sure to reconnect all disconnected connectors.</li><li>• Clear the DTC from the TCM memory using the M-MDS.</li><li>• Start the engine.</li><li>• Warm up AT.</li><li>• Drive the vehicle in D range and make sure that the gears shift smoothly from 1GR to 6GR.</li><li>• Is PENDING CODE for this the DTC present?</li></ul>	Yes	Replace the TCM, then go to the next step.  (See <b>TCM REMOVAL/INSTALLATION [SJ6A-EL].)</b>
		No	Go to the next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the “After Repair Procedure”.</li></ul> (See <b>AFTER REPAIR PROCEDURE [SJ6A-EL].)</b> <ul style="list-style-type: none"><li>• Are any DTCs present?</li></ul>	Yes	Go to the applicable DTC inspection.  (See <b>DTC TABLE [SJ6A-EL].)</b>
		No	DTC troubleshooting completed.



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DTC P0826 [SJ6A-EL]

DTC P0826	Steering shift switch circuit malfunction (open circuit/short to ground)
DETECTION CONDITION	<ul style="list-style-type: none"><li>• TCM detects short circuit or short to ground in steering shift switch circuit when engine is running.</li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>• MIL illuminates if TCM detects the above malfunction condition during the first drive cycle.</li><li>• PENDING CODE is not available.</li><li>• FREEZE FRAME DATA is available.</li><li>• AT warning light illuminate.</li><li>• DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Steering shift switch malfunction</li><li>• Open circuit in wiring harness between steering shift switch terminal 2F and TCM terminal 2AF</li><li>• Short to ground in wiring harness between steering shift switch terminal 2F and TCM terminal 2AF</li><li>• Open circuit in wiring harness between steering shift switch terminal 2C and TCM terminal 2AB</li><li>• Damaged connector between steering shift switch and TCM</li><li>• Clock spring malfunction</li><li>• TCM malfunction</li></ul>



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> </ul>	Yes Perform repair or diagnosis according to the available repair information.

	<ul style="list-style-type: none"> <li>Is any related repair information available?</li> </ul>		<ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>
		No	Go to the next step.
3	<b>INSPECT CLOCK SPRING CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the clock spring connector.</li> <li>Inspect for poor connection at clock spring terminals 2C, 2F, 5C and 5F (such as damaged/pulled-out pins, corrosion).</li> <li>Are the connector and terminals normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 10.
4	<b>INSPECT CLOCK SPRING GROUND CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for continuity between the clock spring (wiring harness-side) terminal 5C and TCM (wiring harness-side) terminal 2AB.</li> <li>Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 10.
5	<b>INSPECT STEERING SHIFT SWITCH</b> <ul style="list-style-type: none"> <li>Inspect the steering shift switch. (See <a href="#">STEERING SHIFT SWITCH INSPECTION.</a>)</li> <li>Is the steering shift switch normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the steering shift switch, then go to Step 10.  (See <a href="#">AUDIO CONTROL SWITCH REMOVAL/INSTALLATION.</a> )
6	<b>INSPECT CLOCK SPRING</b> <ul style="list-style-type: none"> <li>Inspect the clock spring. (See <a href="#">CLOCK SPRING INSPECTION.</a>)</li> <li>Is the clock spring normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the clock spring, then go to Step 10.  (See <a href="#">CLOCK SPRING REMOVAL/INSTALLATION.</a> )
7	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Disconnect the TCM connector.</li> <li>Inspect for poor connection at TCM terminals 2AB and 2AF (such as damaged/pulled-out pins, corrosion).</li> <li>Are the connector and terminals normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 10.
8	<b>INSPECT SHIFT CONTROL SIGNAL CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for continuity between the clock spring (wiring harness-side) terminal 5F and TCM (wiring harness-side) terminal 2AF.</li> <li>Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness, then go to Step 10.
9	<b>INSPECT SHIFT CONTROL SIGNAL CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>Inspect for continuity between the clock spring (wiring harness-side) terminal 5F and body ground.</li> <li>Is there continuity?</li> </ul>	Yes	Repair or replace the wiring harness, then go to Step 10.
		No	Go to the next step.
10	<b>VERIFY TROUBLESHOOTING OF DTC P0826 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all disconnected connectors.</li> <li>Clear the DTC from the TCM memory using the M-MDS.</li> </ul>	Yes	Replace the TCM, then go to the next step.  (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-</a>

	<ul style="list-style-type: none"><li>• Drive the vehicle in M range, and change gears by operating the steering shift switch.</li><li>• Is same DTC present?</li></ul>	<a href="#">EL].)</a>
		No Go to the next step.
11	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"><li>• Perform the "After Repair Procedure". (See <a href="#">AFTER REPAIR PROCEDURE [SJ6A-EL].)</a></li><li>• Are any DTCs present?</li></ul>	YesGo to the applicable DTC inspection. (See <a href="#">DTC TABLE [SJ6A-EL].)</a>
		No DTC troubleshooting completed.

## 2008 - MX-5 - Transmission/Transaxle

### DTC P0969 [SJ6A-EL]

DTC P0969	Shift solenoid F range/performance (stuck)
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>Feedback current corresponding to solenoid current command value is irregular when engine is running.</li> </ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"> <li>The MIL illuminates if the TCM detects the above malfunction condition during the first drive cycle.</li> <li>A PENDING CODE is not available.</li> <li>FREEZE FRAME DATA is available.</li> <li>The AT warning light illuminates.</li> <li>The DTC is stored in the TCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>ATF level low</li> <li>Deteriorated ATF</li> <li>Shift solenoid F stuck</li> <li>Control valve stuck</li> <li>TCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>

	<ul style="list-style-type: none"> <li>Is any related repair information available?</li> </ul>	No	Go to the next step.
3	<b>INSPECT ATF CONDITION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Inspect the ATF condition. <ul style="list-style-type: none"> <li>Clear red: Normal</li> <li>Light red (pink): Water mixed in fluid</li> <li>Reddish brown: Deteriorated ATF</li> </ul> </li> <li>Is it normal?</li> </ul> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) INSPECTION</b>[SJ6A-EL].)</p>	Yes	Go to the next step.
		No	If the ATF color is light red or reddish brown, replace ATF, then go to Step 6.  (See <b>AUTOMATIC TRANSMISSION FLUID (ATF) REPLACEMENT</b> [SJ6A-EL].)
4	<b>INSPECT ATF LEVEL</b> <ul style="list-style-type: none"> <li>Start the engine.</li> <li>Warm up the AT.</li> <li>Is the ATF level within the specification?</li> </ul> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT</b> [SJ6A-EL].)</p>	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 6.  (See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT</b> [SJ6A-EL].)
5	<b>INSPECT LINE PRESSURE</b> <ul style="list-style-type: none"> <li>Start the engine.</li> <li>Measure the line pressure.</li> </ul> <p>(See <b>MECHANICAL SYSTEM TEST</b>[SJ6A-EL].)</p> <ul style="list-style-type: none"> <li>Are the line pressures within the specifications?</li> </ul>	Yes	Go to the next step.
		No	<ul style="list-style-type: none"> <li>All ranges: Replace the oil pump or control valve body, then go to the next step.</li> <li>Any ranges: Replace the AT, then go the next step.</li> </ul> <p>(See <b>AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION</b> [SJ6A-EL].)</p>
6	<b>VERIFY TROUBLESHOOTING OF DTC P0969 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all the disconnected connectors.</li> </ul>	Yes	Replace the TCM, then go to the next step.  (See <b>TCM REMOVAL/INSTALLATION</b> [SJ6A-EL].)

	<ul style="list-style-type: none"> <li>• Clear the DTC from the memory using the M-MDS.</li> <li>• Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li> <li>• Is same DTC present?</li> </ul>	No	Go to the next step.
7	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform the "After Repair Procedure".</li> </ul> <p>(See <b>AFTER REPAIR PROCEDURE [SJ6A-EL]</b>.)</p> <ul style="list-style-type: none"> <li>• Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [SJ6A-EL]</b> .)
		No	Troubleshooting completed.

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2008 - MX-5 - Transmission/Transaxle

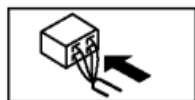
DTC P0970 [SJ6A-EL]

DTC P0970	Shift solenoid F circuit malfunction (short to ground/open circuit)
DETECTION CONDITION	<ul style="list-style-type: none"><li>• Open or short circuit in shift solenoid F signal system (while TCM monitors solenoid output voltage, the voltage that differs from the signal output by CPU in TCM is detected).</li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>• The MIL illuminates if the TCM detects the above malfunction condition during the first drive cycle.</li><li>• A PENDING CODE is not available.</li><li>• FREEZE FRAME DATA is available.</li><li>• The AT warning light illuminates.</li><li>• The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Open circuit between shift solenoid F terminal B and TCM terminal 1Z</li><li>• Open circuit between shift solenoid F terminal A and TCM terminal 1O</li><li>• Short to ground in wiring harness between shift solenoid F terminal B and TCM terminal 1Z</li><li>• Short to ground in wiring harness between shift solenoid F terminal A and TCM terminal 1O</li><li>• Shift solenoid F malfunction</li><li>• Damaged connector between shift solenoid F and TCM</li><li>• TCM malfunction</li></ul>



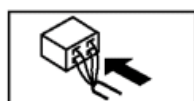
# AUTOMATIC TRANSMISSION WIRING HARNESS-SIDE CONNECTOR (COUPLE COMPONENT)

O	M	K	I	G	E	C	A
N	L	J	H	F	D	B	

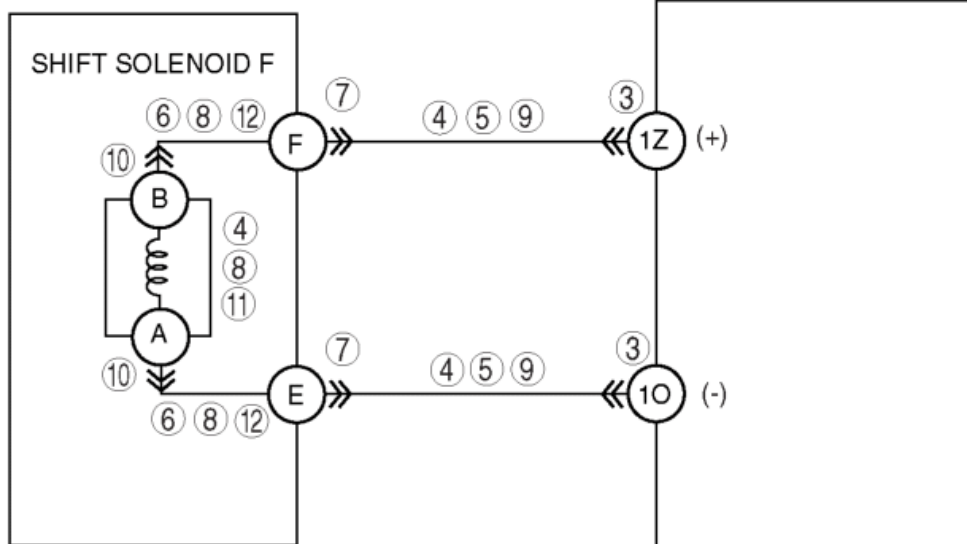


# SHIFT SOLENOID F WIRING HARNESS-SIDE CONNECTOR

B	A
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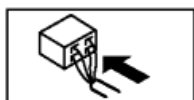


# AUTOMATIC TRANSMISSION (COUPLE COMPONENT)

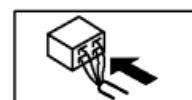


# TCM WIRING HARNESS-SIDE CONNECTOR

<div></div>											
	1AF	1AA	1Y	1R	1P			1H	1D		
1AG	1AC	1AB	1Z	1V	1S	1Q	1O	1L	1I	1E	1A
1AH	1AD			1W	1T			1M	1J	1F	1B
1AI	1AE			1X	1U			1N	1K	1G	1C



<div></div>										
2AF	2AB			2R	2O	2J	2F			
2AG	2AC	2Y	2V	2S	2P	2M	2K	2G	2C	
2AH	2AD	2Z	2W	2T	2Q	2N	2L	2H	2D	2A
2AI	2AE	2AA	2X	2U				2I	2E	2B



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.  No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> No Go to the next step.
3	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the TCM connector.</li> <li>Inspect for poor connection at TCM terminals 1Z and 1O (such as damaged/pulled-out pins, corrosion).</li> </ul>	Yes Go to the next step.  No Repair or replace the connector and/or terminal, then go to Step 13.

	<ul style="list-style-type: none"> <li>• Are terminals normal?</li> </ul>		
4	<b>INSPECT RESISTANCE OF SHIFT SOLENOID F CIRCUIT</b> <ul style="list-style-type: none"> <li>• Inspect for resistance between TCM terminals 1Z and 1O (wiring harness-side).</li> <li>• Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to the next step.
		No	Go to go to Step 7.
5	<b>INSPECT SHIFT SOLENOID F CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Disconnect the couple component connector.</li> <li>• Inspect for continuity between TCM terminals (wiring harness-side) and body ground. <ul style="list-style-type: none"> <li>▪ Terminal 1Z and body ground</li> <li>▪ Terminal 1O and body ground</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for short to ground, then go to Step 13.
6	<b>INSPECT SHIFT SOLENOID F CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between couple component terminals (wiring harness-side) and body ground. <ul style="list-style-type: none"> <li>▪ Terminal F and body ground</li> <li>▪ Terminal E and body ground</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes	Go to go to Step 13.
		No	Repair or replace the couple component, then go to the next step.
7	<b>INSPECT COUPLE COMPONENT CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Disconnect the couple component connector.</li> <li>• Inspect for poor connection at couple component terminals H and G (such as damaged/pulled-out pins, corrosion).</li> <li>• Are terminals normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 13.
8	<b>INSPECT RESISTANCE OF SHIFT SOLENOID F CIRCUIT</b> <ul style="list-style-type: none"> <li>• Inspect the resistance between couple component (transmission case side) terminals H and G.</li> <li>• Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to the next step.
		No	Go to Step 10.
9	<b>INSPECT SHIFT SOLENOID F CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>• Inspect for continuity between TCM terminals and couple component terminals (wiring harness-side). <ul style="list-style-type: none"> <li>▪ Terminal 1Z and terminal F</li> <li>▪ Terminal 1O and terminal E</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes	Go to Step 13.
		No	Repair or replace the wiring harness for open circuit, go to Step 13.
10	<b>INSPECT SHIFT SOLENOID F CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>• Disconnect the shift solenoid F connector.</li> <li>• Inspect for poor connection at shift solenoid F terminals A and B (such as damaged/pulled-out pins, corrosion).</li> <li>• Are terminals normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 13.
11	<b>INSPECT SHIFT SOLENOID F</b> <ul style="list-style-type: none"> <li>• Inspect the shift solenoid F. (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to the next step.
		No	Replace the control valve body, then go to

	<ul style="list-style-type: none"> <li>Is the shift solenoid F normal?</li> </ul>	<p>Step 13.</p> <p>(See <a href="#">CONTROL VALVE BODY REMOVAL [SJ6A-EL]</a>.)</p> <p>(See <a href="#">CONTROL VALVE BODY INSTALLATION [SJ6A-EL]</a>.)</p>
12	<p><b>INSPECT SHIFT SOLENOID F CIRCUIT FOR OPEN CIRCUIT</b></p> <ul style="list-style-type: none"> <li>Inspect for continuity between couple component terminals and shift solenoid F terminals (wiring harness-side). <ul style="list-style-type: none"> <li>Terminal F and terminal B</li> <li>Terminal E and terminal A</li> </ul> </li> <li>Is there continuity?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Repair or replace the couple component, then go to the next step.</p>
13	<p><b>VERIFY TROUBLESHOOTING OF DTC P0970 COMPLETED</b></p> <ul style="list-style-type: none"> <li>Make sure to reconnect all the disconnected connectors.</li> <li>Clear the DTC from the memory using the M-MDS.</li> <li>Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li> <li>Is same DTC present?</li> </ul>	<p>Yes Replace the TCM, then go to the next step. (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL]</a>.)</p> <p>No Go to the next step.</p>
14	<p><b>VERIFY AFTER REPAIR PROCEDURE</b></p> <ul style="list-style-type: none"> <li>Perform the "After Repair Procedure". (See <a href="#">AFTER REPAIR PROCEDURE [SJ6A-EL]</a>.)</li> <li>Are any DTCs present?</li> </ul>	<p>Yes Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [SJ6A-EL]</a>.)</p> <p>No Troubleshooting completed.</p>

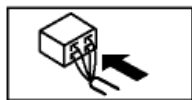
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DTC P0971 [SJ6A-EL]

DTC P0971	Shift solenoid F circuit malfunction (short to power)
DETECTION CONDITION	<ul style="list-style-type: none"><li>• Short circuit in shift solenoid F signal system (while TCM monitors solenoid output voltage, the voltage that differs from the signal output by CPU in TCM is detected).</li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>• The MIL illuminates if the TCM detects the above malfunction condition during the first drive cycle.</li><li>• A PENDING CODE is not available.</li><li>• FREEZE FRAME DATA is available.</li><li>• The AT warning light illuminates.</li><li>• The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Short to power in wiring harness between shift solenoid F terminal B and TCM terminal 1Z</li><li>• Short to power in wiring harness between shift solenoid F terminal A and TCM terminal 1O</li><li>• Shift solenoid F malfunction</li><li>• Damaged connector between shift solenoid F and TCM</li><li>• TCM malfunction</li></ul>

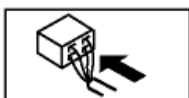
**AUTOMATIC TRANSMISSION  
WIRING HARNESS-SIDE CONNECTOR  
(COUPLE COMPONENT)**

O	M	K	I	G	E	C	A
N	L	J	H	F	D	B	

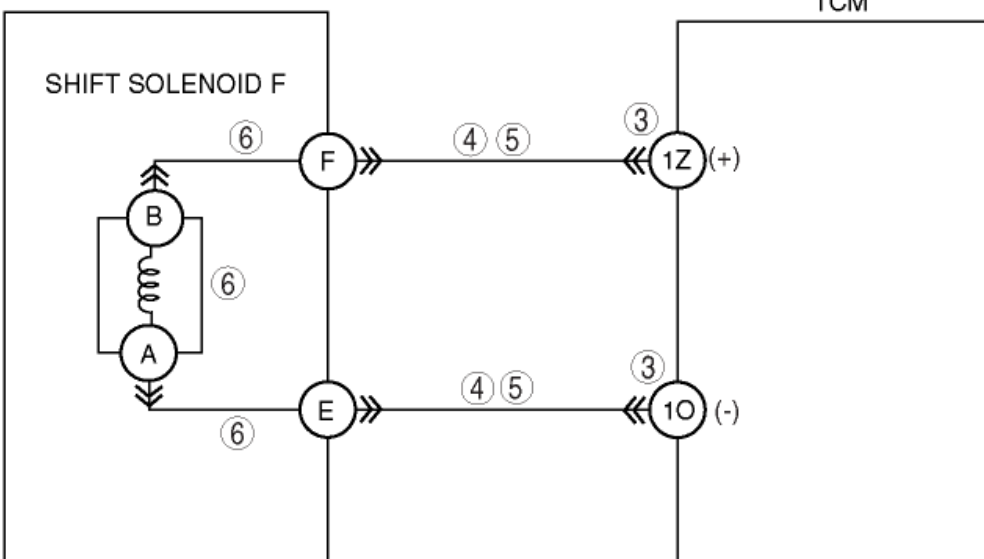


**SHIFT SOLENOID F  
WIRING HARNESS-SIDE  
CONNECTOR**

B	A
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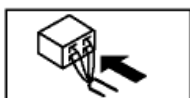


**AUTOMATIC TRANSMISSION  
(COUPLE COMPONENT)**

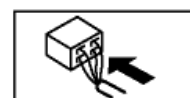


**TCM WIRING HARNESS-SIDE CONNECTOR**

	1AF	1AA	1Y	1R	1P		1H	1D
1AG	1AC	1AB	1Z	1V	1S	1Q	1O	1L
1AH	1AD		1W	1T		1M	1J	1F
1AI	1AE		1X	1U		1N	1K	1G



	2AF	2AB		2R	2O	2J	2F	
2AG	2AC	2Y	2V	2S	2P	2M	2K	2G
2AH	2AD	2Z	2W	2T	2Q	2N	2L	2H
2AI	2AE	2AA	2X	2U			2I	2E



**Diagnostic procedure**

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step. No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> No Go to the next step.
3	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the TCM connector.</li> <li>Inspect for poor connection at TCM terminals 1Z and 1O (such as damaged/pulled-out pins, corrosion).</li> </ul>	Yes Go to the next step. No Repair or replace the connector and/or terminal, then go to Step 7.

	<ul style="list-style-type: none"> <li>Are terminals normal?</li> </ul>		
4	<b>INSPECT SHIFT SOLENOID F CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position (engine off).</li> <li>Measure the voltage at TCM (wiring harness-side) terminals 1Z and 1O.</li> <li>Is there <b>0 V</b> at the TCM wiring harness-side connector terminals?</li> </ul>	Yes	Go to go to Step 7.
		No	Go to the next step.
5	<b>INSPECT SHIFT SOLENOID F CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the couple component connector.</li> <li>Turn the ignition switch to the ON position (engine off).</li> <li>Measure the voltage at TCM (wiring harness-side) terminals 1Z and 1O.</li> <li>Is there <b>0 V</b> at the TCM wiring harness-side connector terminals?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness (TCM—couple component connector) for short to power supply, then go to Step 7.
6	<b>INSPECT SHIFT SOLENOID F</b> <ul style="list-style-type: none"> <li>Inspect the shift solenoid F. (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL].</a>)</li> <li>Is the shift solenoid F normal?</li> </ul>	Yes	Repair or replace the wiring harness (couple component connector—shift solenoid F) for short to power supply, then go to the next step.
		No	Replace the control valve body, then go to the next step. (See <a href="#">CONTROL VALVE BODY REMOVAL [SJ6A-EL].</a> ) (See <a href="#">CONTROL VALVE BODY INSTALLATION [SJ6A-EL].</a> )
7	<b>VERIFY TROUBLESHOOTING OF DTC P0971 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all the disconnected connectors.</li> <li>Clear the DTC from the memory using the M-MDS.</li> <li>Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li> <li>Is same DTC present?</li> </ul>	Yes	Replace the TCM, then go to the next step. (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL].</a> )
		No	Go to the next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the “After Repair Procedure”. (See <a href="#">AFTER REPAIR PROCEDURE [SJ6A-EL].</a>)</li> <li>Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [SJ6A-EL].</a> )
		No	Troubleshooting completed.

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### DTC P2719 [SJ6A-EL]

DTC P2719	Shift solenoid G range/performance (stuck)
<b>DETECTION CONDITION</b>	<ul style="list-style-type: none"> <li>Feedback current corresponding to solenoid current command value is irregular when engine is running.</li> </ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"> <li>The MIL illuminates if the TCM detects the above malfunction condition during the first drive cycle.</li> <li>A PENDING CODE is not available.</li> <li>FREEZE FRAME DATA is available.</li> <li>The AT warning light illuminates.</li> <li>The DTC is stored in the TCM memory.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>ATF level low</li> <li>Deteriorated ATF</li> <li>Shift solenoid G stuck</li> <li>Control valve stuck</li> <li>TCM malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.
		No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul>

	<ul style="list-style-type: none"><li>Is any related repair information available?</li></ul>	No	Go to the next step.
3	<b>INSPECT ATF CONDITION</b> <ul style="list-style-type: none"><li>Turn the ignition switch to the LOCK position.</li><li>Inspect the ATF condition.<ul style="list-style-type: none"><li>Clear red: Normal</li><li>Light red (pink): Water mixed in fluid</li><li>Reddish brown: Deteriorated ATF</li></ul></li><li>Is it normal?</li></ul> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) INSPECTION</b>[SJ6A-EL].)</p>	Yes	Go to the next step.
		No	If the ATF color is light red or reddish brown, replace ATF, then go to Step 6.  (See <b>AUTOMATIC TRANSMISSION FLUID (ATF) REPLACEMENT</b> [SJ6A-EL].)
4	<b>INSPECT ATF LEVEL</b> <ul style="list-style-type: none"><li>Start the engine.</li><li>Warm up the AT.</li><li>Is the ATF level within the specification?</li></ul> <p>(See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT</b> [SJ6A-EL].)</p>	Yes	Go to the next step.
		No	Add ATF to the specified level, then go to Step 6.  (See <b>AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT</b> [SJ6A-EL].)
5	<b>INSPECT LINE PRESSURE</b> <ul style="list-style-type: none"><li>Start the engine.</li><li>Measure the line pressure.</li></ul> <p>(See <b>MECHANICAL SYSTEM TEST</b>[SJ6A-EL].)</p> <ul style="list-style-type: none"><li>Are the line pressures within the specifications?</li></ul>	Yes	Go to the next step.
		No	<ul style="list-style-type: none"><li>All ranges: Replace the oil pump or control valve body, then go to the next step.</li><li>Any ranges: Replace the AT, then go the next step.</li></ul> <p>(See <b>AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION</b> [SJ6A-EL].)</p>
6	<b>VERIFY TROUBLESHOOTING OF DTC P2719 COMPLETED</b> <ul style="list-style-type: none"><li>Make sure to reconnect all the disconnected connectors.</li></ul>	Yes	Replace the TCM, then go to the next step.  (See <b>TCM REMOVAL/INSTALLATION</b> [SJ6A-EL].)



	<ul style="list-style-type: none"> <li>• Clear the DTC from the memory using the M-MDS.</li> <li>• Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li> <li>• Is same DTC present?</li> </ul>	No	Go to the next step.
7	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform the "After Repair Procedure".</li> </ul> <p>(See <b>AFTER REPAIR PROCEDURE [SJ6A-EL]</b>.)</p> <ul style="list-style-type: none"> <li>• Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <b>DTC TABLE [SJ6A-EL]</b> .)
		No	Troubleshooting completed.

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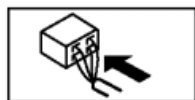
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DTC P2720 [SJ6A-EL]

DTC P2720	Shift solenoid G circuit malfunction (short to ground/open circuit)
DETECTION CONDITION	<ul style="list-style-type: none"><li>• Open or short circuit in shift solenoid G signal system (while TCM monitors solenoid output voltage, the voltage that differs from the signal output by CPU in TCM is detected).</li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>• The MIL illuminates if the TCM detects the above malfunction condition during the first drive cycle.</li><li>• A PENDING CODE is not available.</li><li>• FREEZE FRAME DATA is available.</li><li>• The AT warning light illuminates.</li><li>• The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Open circuit between shift solenoid G terminal B and TCM terminal 1Y</li><li>• Open circuit between shift solenoid G terminal A and TCM terminal 1L</li><li>• Short to ground in wiring harness between shift solenoid G terminal B and TCM terminal 1Y</li><li>• Short to ground in wiring harness between shift solenoid G terminal A and TCM terminal 1L</li><li>• Shift solenoid G malfunction</li><li>• Damaged connector between shift solenoid G and TCM</li><li>• TCM malfunction</li></ul>

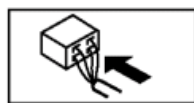
# AUTOMATIC TRANSMISSION WIRING HARNESS-SIDE CONNECTOR (COUPLE COMPONENT)

O	M	K	I	G	E	C	A
N	L	J	H	F	D	B	

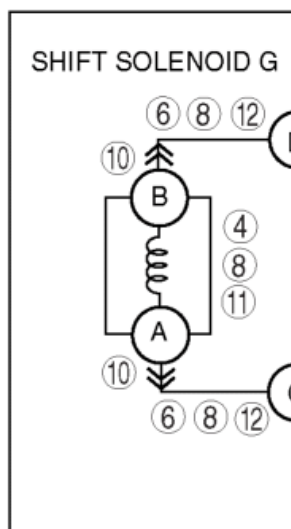


# SHIFT SOLENOID G WIRING HARNESS-SIDE CONNECTOR

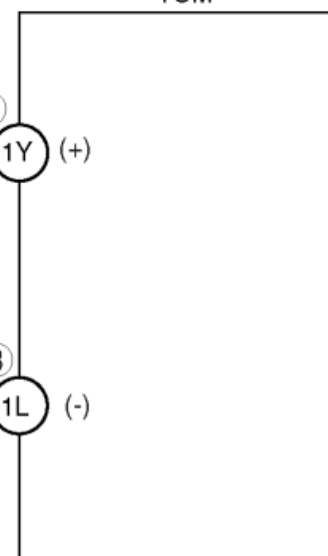
B	A
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# AUTOMATIC TRANSMISSION (COUPLE COMPONENT)

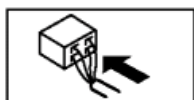


# TCM

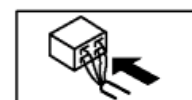


# TCM WIRING HARNESS-SIDE CONNECTOR

	1AF	1AA	1Y	1R	1P		1H	1D
1AG	1AC	1AB	1Z	1V	1S	1Q	1O	1L
1AH	1AD			1W	1T			1M
1AI	1AE			1X	1U			1N



	2AF	2AB		2R	2O	2J	2F
2AG	2AC	2Y	2V	2S	2P	2M	2K
2AH	2AD	2Z	2W	2T	2Q	2N	2L
2AI	2AE	2AA	2X	2U			2I



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step.  No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> No Go to the next step.
3	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the TCM connector.</li> <li>Inspect for poor connection at TCM terminals 1Y and 1L (such as damaged/pulled-out pins, corrosion).</li> </ul>	Yes Go to the next step.  No Repair or replace the connector and/or terminal, then go to Step 13.

	<ul style="list-style-type: none"> <li>Are terminals normal?</li> </ul>		
4	<b>INSPECT RESISTANCE OF SHIFT SOLENOID G CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for resistance between TCM terminals 1Y and 1L (wiring harness-side).</li> <li>Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to the next step.
		No	Go to go to Step 7.
5	<b>INSPECT SHIFT SOLENOID G CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>Disconnect the couple component connector.</li> <li>Inspect for continuity between TCM terminals (wiring harness-side) and body ground. <ul style="list-style-type: none"> <li>Terminal 1Y and body ground</li> <li>Terminal 1L and body ground</li> </ul> </li> <li>Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness for short to ground, then go to Step 13.
6	<b>INSPECT SHIFT SOLENOID G CIRCUIT FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>Inspect for continuity between couple component terminals (wiring harness-side) and body ground. <ul style="list-style-type: none"> <li>Terminal D and body ground</li> <li>Terminal C and body ground</li> </ul> </li> <li>Is there continuity?</li> </ul>	Yes	Go to go to Step 13.
		No	Repair or replace the couple component, then go to the next step.
7	<b>INSPECT COUPLE COMPONENT CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the couple component connector.</li> <li>Inspect for poor connection at couple component terminals H and G (such as damaged/pulled-out pins, corrosion).</li> <li>Are terminals normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 13.
8	<b>INSPECT RESISTANCE OF SHIFT SOLENOID G CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect the resistance between couple component (transmission case side) terminals H and G.</li> <li>Is the resistance <b>within 5.0—5.6 ohms</b>? (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to the next step.
		No	Go to Step 10.
9	<b>INSPECT SHIFT SOLENOID G CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for continuity between TCM terminals and couple component terminals (wiring harness-side). <ul style="list-style-type: none"> <li>Terminal 1Y and terminal D</li> <li>Terminal 1L and terminal C</li> </ul> </li> <li>Is there continuity?</li> </ul>	Yes	Go to Step 13.
		No	Repair or replace the wiring harness for open circuit, go to Step 13.
10	<b>INSPECT SHIFT SOLENOID G CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Disconnect the shift solenoid G connector.</li> <li>Inspect for poor connection at shift solenoid G terminals A and B (such as damaged/pulled-out pins, corrosion).</li> <li>Are terminals normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the connector and/or terminal, then go to Step 13.
11	<b>INSPECT SHIFT SOLENOID G</b> <ul style="list-style-type: none"> <li>Inspect the shift solenoid G. (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> </ul>	Yes	Go to the next step.
		No	Replace the control valve body, then go to

	<ul style="list-style-type: none"> <li>Is the shift solenoid G normal?</li> </ul>	<p>Step 13.</p> <p>(See <a href="#">CONTROL VALVE BODY REMOVAL [SJ6A-EL]</a>.)</p> <p>(See <a href="#">CONTROL VALVE BODY INSTALLATION [SJ6A-EL]</a>.)</p>
12	<b>INSPECT SHIFT SOLENOID G CIRCUIT FOR OPEN CIRCUIT</b> <ul style="list-style-type: none"> <li>Inspect for continuity between couple component terminals and shift solenoid G terminals (wiring harness-side). <ul style="list-style-type: none"> <li>Terminal D and terminal B</li> <li>Terminal C and terminal A</li> </ul> </li> <li>Is there continuity?</li> </ul>	<p>Yes Go to the next step.</p> <p>No Repair or replace the couple component, then go to the next step.</p>
13	<b>VERIFY TROUBLESHOOTING OF DTC P2720 COMPLETED</b> <ul style="list-style-type: none"> <li>Make sure to reconnect all the disconnected connectors.</li> <li>Clear the DTC from the memory using the M-MDS.</li> <li>Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li> <li>Is same DTC present?</li> </ul>	<p>Yes Replace the TCM, then go to the next step. (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL]</a>.)</p> <p>No Go to the next step.</p>
14	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>Perform the "After Repair Procedure". (See <a href="#">AFTER REPAIR PROCEDURE [SJ6A-EL]</a>.)</li> <li>Are any DTCs present?</li> </ul>	<p>Yes Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [SJ6A-EL]</a>.)</p> <p>No Troubleshooting completed.</p>

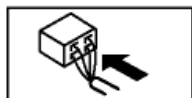
2008 - MX-5 - Transmission/Transaxle

DTC P2721 [SJ6A-EL]

DTC P2721	Shift solenoid G circuit malfunction (short to power)
DETECTION CONDITION	<ul style="list-style-type: none"><li>Short circuit in shift solenoid G signal system (while TCM monitors solenoid output voltage, the voltage that differs from the signal output by CPU in TCM is detected).</li></ul> <p><b>Diagnostic support note:</b></p> <ul style="list-style-type: none"><li>The MIL illuminates if the TCM detects the above malfunction condition during the first drive cycle.</li><li>A PENDING CODE is not available.</li><li>FREEZE FRAME DATA is available.</li><li>The AT warning light illuminates.</li><li>The DTC is stored in the TCM memory.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Short to power in wiring harness between shift solenoid G terminal B and TCM terminal 1Y</li><li>Short to power in wiring harness between shift solenoid G terminal A and TCM terminal 1L</li><li>Shift solenoid G malfunction</li><li>Damaged connector between shift solenoid G and TCM</li><li>TCM malfunction</li></ul>

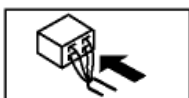
**AUTOMATIC TRANSMISSION  
WIRING HARNESS-SIDE CONNECTOR  
(COUPLE COMPONENT)**

O	M	K	I	G	E	C	A
N	L	J	H	F	D	B	

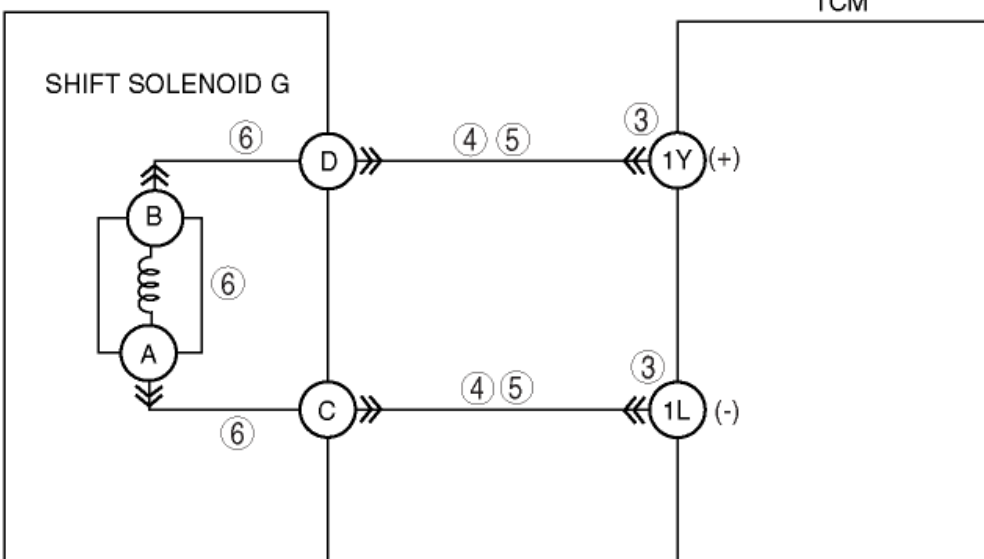


**SHIFT SOLENOID G  
WIRING HARNESS-SIDE  
CONNECTOR**

B	A
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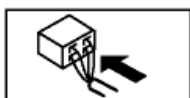


**AUTOMATIC TRANSMISSION  
(COUPLE COMPONENT)**

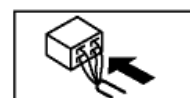


**TCM WIRING HARNESS-SIDE CONNECTOR**

	1AF	1AA	1Y	1R	1P		1H	1D
1AG	1AC	1AB	1Z	1V	1S	1Q	1O	1L
1AH	1AD		1W	1T		1M	1J	1F
1AI	1AE		1X	1U		1N	1K	1G



	2AF	2AB		2R	2O	2J	2F	
2AG	2AC	2Y	2V	2S	2P	2M	2K	2G
2AH	2AD	2Z	2W	2T	2Q	2N	2L	2H
2AI	2AE	2AA	2X	2U			2I	2E



**Diagnostic procedure**

STEP	INSPECTION	ACTION
1	<b>VERIFY FREEZE FRAME DATA HAS BEEN RECORDED</b> <ul style="list-style-type: none"> <li>Has the FREEZE FRAME DATA been recorded?</li> </ul>	Yes Go to the next step. No Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	<b>VERIFY RELATED REPAIR INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"> <li>Verify related Service Bulletins and/or on-line repair information availability.</li> <li>Is any related repair information available?</li> </ul>	Yes Perform repair or diagnosis according to the available repair information. <ul style="list-style-type: none"> <li>If the vehicle is not repaired, go to the next step.</li> </ul> No Go to the next step.
3	<b>INSPECT TCM CONNECTOR FOR POOR CONNECTION</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the TCM connector.</li> <li>Inspect for poor connection at TCM terminals 1Y and 1L (such as damaged/pulled-out pins, corrosion).</li> </ul>	Yes Go to the next step. No Repair or replace the connector and/or terminal, then go to Step 7.

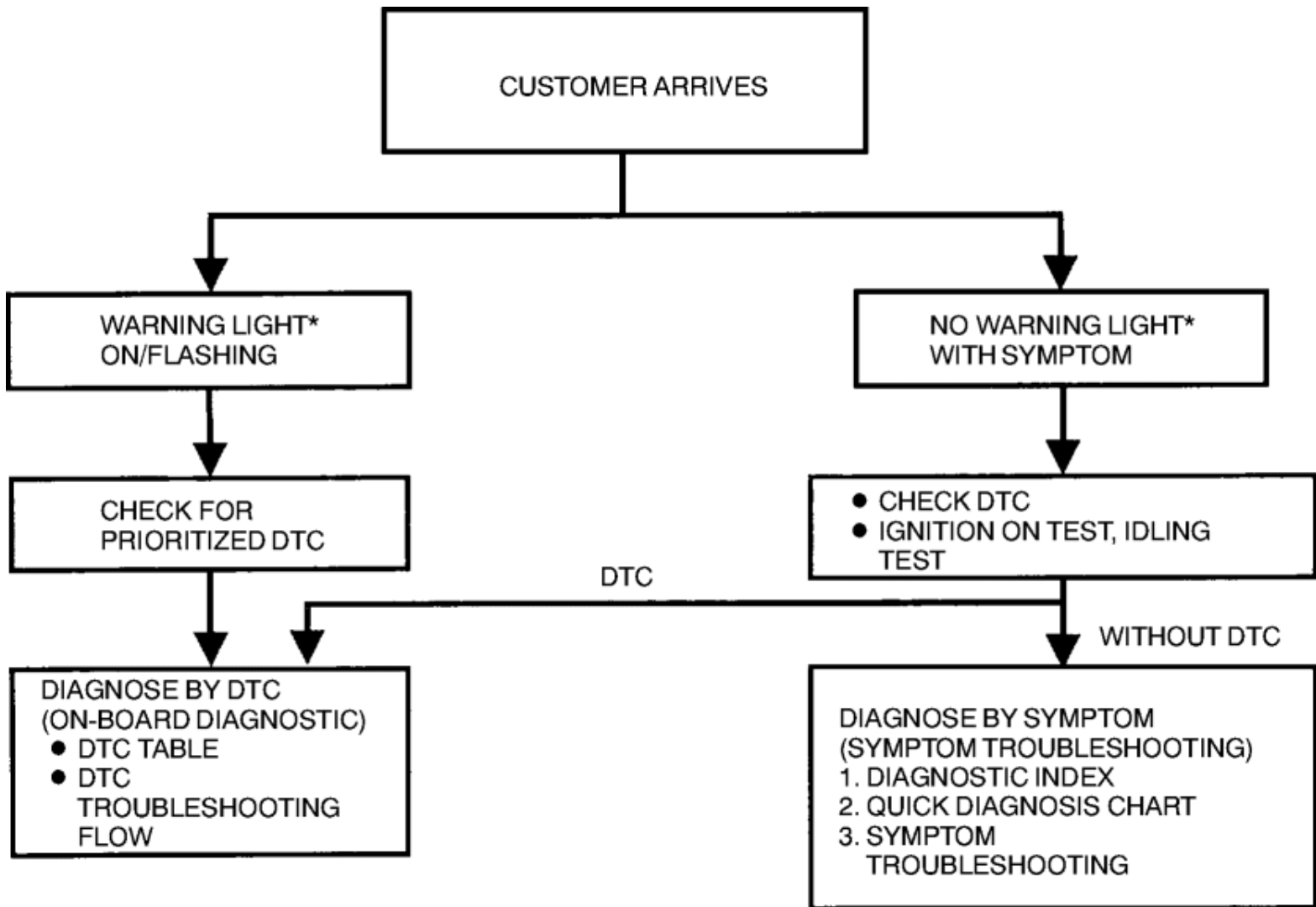
	<ul style="list-style-type: none"> <li>• Are terminals normal?</li> </ul>		
4	<b>INSPECT SHIFT SOLENOID G CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position (engine off).</li> <li>• Measure the voltage at TCM (wiring harness-side) terminals 1Y and 1L.</li> <li>• Is there <b>0 V</b> at the TCM wiring harness-side connector terminals?</li> </ul>	Yes	Go to go to Step 7.
		No	Go to the next step.
5	<b>INSPECT SHIFT SOLENOID G CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Disconnect the couple component connector.</li> <li>• Turn the ignition switch to the ON position (engine off).</li> <li>• Measure the voltage at TCM (wiring harness-side) terminals 1Y and 1L.</li> <li>• Is there <b>0 V</b> at the TCM wiring harness-side connector terminals?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace the wiring harness (TCM—couple component connector) for short to power supply, then go to Step 7.
6	<b>INSPECT SHIFT SOLENOID G</b> <ul style="list-style-type: none"> <li>• Inspect the shift solenoid G. (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</li> <li>• Is the shift solenoid G normal?</li> </ul>	Yes	Repair or replace the wiring harness (couple component connector—shift solenoid G) for short to power supply, then go to the next step.
		No	Replace the control valve body, then go to the next step. (See <a href="#">CONTROL VALVE BODY REMOVAL [SJ6A-EL]</a> .) (See <a href="#">CONTROL VALVE BODY INSTALLATION [SJ6A-EL]</a> .)
7	<b>VERIFY TROUBLESHOOTING OF DTC P2721 COMPLETED</b> <ul style="list-style-type: none"> <li>• Make sure to reconnect all the disconnected connectors.</li> <li>• Clear the DTC from the memory using the M-MDS.</li> <li>• Drive the vehicle in D range and make sure that gears shift smoothly from 1GR to 6GR.</li> <li>• Is same DTC present?</li> </ul>	Yes	Replace the TCM, then go to the next step. (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL]</a> .)
		No	Go to the next step.
8	<b>VERIFY AFTER REPAIR PROCEDURE</b> <ul style="list-style-type: none"> <li>• Perform the “After Repair Procedure”. (See <a href="#">AFTER REPAIR PROCEDURE [SJ6A-EL]</a>.)</li> <li>• Are any DTCs present?</li> </ul>	Yes	Go to the applicable DTC inspection. (See <a href="#">DTC TABLE [SJ6A-EL]</a> .)
		No	Troubleshooting completed.



## 2008 - MX-5 - Transmission/Transaxle

### FOREWORD [SJ6A-EL]

- When the customer reports a vehicle malfunction, inspect the malfunction indicator lamp (MIL) indication, AT warning indicator light flash, and diagnostic trouble code (DTC), then diagnose the malfunction according to following flowchart.
  - If a DTC exists, diagnose the applicable DTC inspection. (See [DTC TABLE \[SJ6A-EL\]](#).)
  - If a DTC does not exist, the MIL does not illuminate and the AT warning indicator light illuminate, diagnose the applicable symptom troubleshooting. (See [SYMPTOM TROUBLESHOOTING ITEM TABLE \[SJ6A-EL\]](#).)



\*: Malfunction Indicator Lamp (MIL), AT warning light.



## 2008 - MX-5 - Transmission/Transaxle

### BASIC INSPECTION [SJ6A-EL]

STEP	INSPECTION	ACTION	
1	<ul style="list-style-type: none"> <li>Measure the battery voltage.</li> <li>Is the battery voltage <b>10.0—14.0 V</b>?</li> </ul>	Yes	Go to the next step.
		No	Replace or recharge the battery. (See <a href="#">BATTERY RECHARGING [LF]</a> .)
2	<ul style="list-style-type: none"> <li>Inspect the TCM related harnesses, connectors and fuses.</li> <li>Are they normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts according to the inspection result.
3	<ul style="list-style-type: none"> <li>Warm up the engine to normal operating temperature.</li> <li>Retrieve DTC using the M-MDS.</li> <li>Is there any DTC present?</li> </ul>	Yes	Record Freeze Frame Data and perform appropriate DTC troubleshooting procedures.
		No	Go to the next step.
4	<ul style="list-style-type: none"> <li>Inspect ATF color and condition. (See <a href="#">AUTOMATIC TRANSMISSION FLUID (ATF) INSPECTION [SJ6A-EL]</a>.)</li> <li>Are ATF color and odor normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts according to the inspection result.  Flush AT and cooler line if necessary.
5	<ul style="list-style-type: none"> <li>Perform the road test.</li> <li>Is the AT operating normally?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts according to the inspection result.
6	<ul style="list-style-type: none"> <li>Perform the time lag test.</li> <li>Is the AT operating normally?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts according to the inspection result.
7	<ul style="list-style-type: none"> <li>Perform the stall test.</li> </ul>	Yes	Go to the next step.

	<ul style="list-style-type: none"><li>Is the stall speed within the specified?</li></ul>	No	Repair or replace any malfunctioning parts according to the inspection result.
8	<ul style="list-style-type: none"><li>Perform the line pressure test.</li><li>Is the line pressure within the specified?</li></ul>	Yes	Perform the symptom troubleshooting and follow the procedures.
		No	Repair or replace any malfunctioning parts according to the inspection result.
9	<ul style="list-style-type: none"><li>Inspect following part or signal related PIDs using the M-MDS.<ul style="list-style-type: none"><li>APP sensor</li><li>TP sensor</li><li>TSS</li><li>VSS</li><li>TFT sensor</li><li>TR switch</li><li>M range switch</li><li>Up switch</li><li>Down switch</li><li>Brake switch</li><li>Engine speed</li><li>ECT</li><li>Engine torque</li></ul></li><li>Are they normal?</li></ul>	Yes	Perform the symptom troubleshooting and follow the procedures.
		No	Repair or replace any malfunctioning parts according to the inspection result.

## 2008 - MX-5 - Transmission/Transaxle

### SYMPTOM TROUBLESHOOTING ITEM TABLE [SJ6A-EL]

- Use the chart below to verify the symptoms of the trouble in order to diagnose the appropriate area.

No.	TROUBLESHOOTING ITEM	DESCRIPTION	PAGE
1	<ul style="list-style-type: none"> <li>• Vehicle does not move in D range, or in R position</li> </ul>	<ul style="list-style-type: none"> <li>• Vehicle does not move when accelerator pedal is depressed.</li> </ul>	(See <b>NO.1 VEHICLE DOES NOT MOVE IN D RANGE, OR IN R POSITION [SJ6A-EL].</b> )
2	<ul style="list-style-type: none"> <li>• Vehicle moves in N position</li> </ul>	<ul style="list-style-type: none"> <li>• Vehicle creeps in N position.</li> <li>• Vehicle creeps if brake pedal is not depressed in N position.</li> </ul>	(See <b>NO.2 VEHICLE MOVES IN N POSITION [SJ6A-EL].</b> )
3	<ul style="list-style-type: none"> <li>• Vehicle moves in P position, or parking gear does not disengage when P position is disengaged</li> </ul>	<ul style="list-style-type: none"> <li>• Vehicle rolls when on a downward slope and tires do not lock in P position.</li> <li>• Tires locked when P position is disengaged, vehicle does not move in D range, and R position when accelerator pedal is depressed, and engine remains in stalled condition.</li> </ul>	(See <b>NO.3 VEHICLE MOVES IN P POSITION, OR PARKING GEAR DOES NOT DISENGAGE WHEN P IS DISENGAGED [SJ6A-EL].</b> )
4	<ul style="list-style-type: none"> <li>• Excessive creep</li> </ul>	<ul style="list-style-type: none"> <li>• Vehicle accelerates in D range, and R position when accelerator pedal is not depressed.</li> </ul>	(See <b>NO.4 EXCESSIVE CREEP [SJ6A-EL].</b> )
5	<ul style="list-style-type: none"> <li>• No creep at all</li> </ul>	<ul style="list-style-type: none"> <li>• Vehicle does not move in D range, or R position when idling on flat paved road.</li> </ul>	(See <b>NO.5 NO CREEP AT ALL [SJ6A-EL].</b> )
6	<ul style="list-style-type: none"> <li>• Low maximum</li> </ul>	<ul style="list-style-type: none"> <li>• Vehicle acceleration is</li> </ul>	(See <b>NO.6 LOW MAXIMUM</b> )

	speed and poor acceleration	<p>poor at start.</p> <ul style="list-style-type: none"> <li>Delayed acceleration when accelerator pedal is depressed while driving.</li> </ul>	<b>SPEED AND POOR ACCELERATION [SJ6A-EL].)</b>
7	<ul style="list-style-type: none"> <li>No shifting</li> </ul>	<ul style="list-style-type: none"> <li>Single shift range only.</li> <li>Sometimes shifts correctly.</li> </ul>	(See <b>NO.7 NO SHIFTING [SJ6A-EL].)</b>
8	<ul style="list-style-type: none"> <li>Does not shift to 6GR</li> </ul>	<ul style="list-style-type: none"> <li>Vehicle does not upshift from 5GR to 6GR even though vehicle speed increased.</li> <li>Vehicle does not shift to 6GR even though accelerator pedal is released in D range at <b>80 km/h {50 mph}</b>.</li> </ul>	(See <b>NO.8 DOES NOT SHIFT TO 6GR [SJ6A-EL].)</b>
9	<ul style="list-style-type: none"> <li>Abnormal shifting</li> </ul>	<ul style="list-style-type: none"> <li>Shifts incorrectly (incorrect shift pattern).</li> </ul>	(See <b>NO.9 ABNORMAL SHIFTING [SJ6A-EL].)</b>
10	<ul style="list-style-type: none"> <li>Frequent shifting</li> </ul>	<ul style="list-style-type: none"> <li>Downshifting occurs suddenly even when accelerator pedal is depressed slightly in D range.</li> </ul>	(See <b>NO.10 FREQUENT SHIFTING [SJ6A-EL].)</b>
11	<ul style="list-style-type: none"> <li>Shift point is high or low</li> </ul>	<ul style="list-style-type: none"> <li>Shift point considerably different from automatic shift diagram.</li> <li>Shift delays when accelerating.</li> <li>Shift occurs suddenly when accelerating and engine speed does not increase.</li> </ul>	(See <b>NO.11 SHIFT POINT IS HIGH OR LOW [SJ6A-EL].)</b>
12	<ul style="list-style-type: none"> <li>Torque converter clutch (TCC) non-operation</li> </ul>	<ul style="list-style-type: none"> <li>TCC does not operate when vehicle reaches TCC operation range.</li> </ul>	(See <b>NO.12 TORQUE CONVERTER CLUTCH (TCC) NON-OPERATION [SJ6A-EL].)</b>
13	<ul style="list-style-type: none"> <li>No kickdown</li> </ul>	<ul style="list-style-type: none"> <li>Does not downshift when accelerator pedal is fully depressed within kickdown range.</li> </ul>	(See <b>NO.13 NO KICKDOWN [SJ6A-EL].)</b>

14	Engine flares up or slips when upshifting or downshifting	<p>When accelerator pedal is depressed, engine speed increases normally but vehicle speed increases slowly.</p> <ul style="list-style-type: none"> <li>When accelerator pedal is depressed while driving, engine speed increases but vehicle speed does not increase.</li> </ul>	(See <b>NO.14 ENGINE FLARES UP OR SLIPS WHEN UPSHIFTING OR DOWNSHIFTING [SJ6A-EL].</b> )
15	<ul style="list-style-type: none"> <li>Engine flares up or slips when accelerating vehicle</li> </ul>	<ul style="list-style-type: none"> <li>Engine flares up when accelerator pedal is depressed for upshifting.</li> <li>Engine flares up suddenly when accelerator pedal is depressed for downshifting.</li> </ul>	(See <b>NO.15 ENGINE FLARES UP OR SLIPS WHEN ACCELERATING VEHICLE [SJ6A-EL].</b> )
16	<ul style="list-style-type: none"> <li>Judder upon torque converter clutch (TCC) operation</li> </ul>	<ul style="list-style-type: none"> <li>Vehicle jolts when TCC is engaged.</li> </ul>	(See <b>NO.16 JUDDER UPON TORQUE CONVERTER CLUTCH (TCC) OPERATION [SJ6A-EL].</b> )
17	<ul style="list-style-type: none"> <li>Excessive shift shock from N to D or N to R position/range</li> </ul>	<ul style="list-style-type: none"> <li>Strong shock is felt when shifting from N to D or N to R position/range at idle.</li> </ul>	(See <b>NO.17 EXCESSIVE SHIFT SHOCK FROM N TO D OR N TO R POSITION/RANGE [SJ6A-EL].</b> )
18	<ul style="list-style-type: none"> <li>Excessive shift shock is given when upshifting and downshifting</li> </ul>	<ul style="list-style-type: none"> <li>Excessive shift shock is felt when depressing accelerator pedal to accelerate at upshifting.</li> <li>During cruising, excessive shift shock is felt when depressing accelerator pedal at downshifting.</li> </ul>	(See <b>NO.18 EXCESSIVE SHIFT SHOCK IS GIVEN WHEN UPSHIFTING AND DOWNSHIFTING [SJ6A-EL].</b> )
19	<ul style="list-style-type: none"> <li>Excessive shift shock on torque converter clutch (TCC)</li> </ul>	<ul style="list-style-type: none"> <li>Strong shock is felt when TCC is engaged.</li> </ul>	(See <b>NO.19 EXCESSIVE SHIFT SHOCK ON TORQUE CONVERTER CLUTCH (TCC) [SJ6A-EL].</b> )
20	<ul style="list-style-type: none"> <li>Noise occurs at idle when vehicle is stopped in all positions/ranges</li> </ul>	<ul style="list-style-type: none"> <li>Transmission is noisy in all positions and ranges when vehicle is idling.</li> </ul>	(See <b>NO.20 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN ALL POSITIONS/RANGES [SJ6A-EL].</b> )

21	Noise occurs at idle when vehicle is stopped in D range, or in R position	Transmission is noisy in driving ranges when vehicle is idling.	(See <b>NO.21 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN D RANGE, OR IN R POSITION [SJ6A-EL].</b> )
22	<ul style="list-style-type: none"> <li>No engine braking</li> </ul>	<ul style="list-style-type: none"> <li>Engine speed drops to idle but vehicle coasts when accelerator pedal is released during cruising at medium to high speeds.</li> <li>Engine speed drops to idle but vehicle coasts when accelerator pedal is released when in M range (1GR) at low vehicle speed.</li> </ul>	(See <b>NO.22 NO ENGINE BRAKING [SJ6A-EL].</b> )
23	<ul style="list-style-type: none"> <li>Transmission overheats</li> </ul>	<ul style="list-style-type: none"> <li>Burnt smell emitted from the transmission.</li> <li>Smoke is emitted from the transmission.</li> </ul>	(See <b>NO.23 TRANSMISSION OVERHEATS [SJ6A-EL].</b> )
24	<ul style="list-style-type: none"> <li>Engine stalls when shifted to D range, or in R position</li> </ul>	<ul style="list-style-type: none"> <li>Engine stalls when shifting from N or P position to D range or R position at idle.</li> </ul>	(See <b>NO.24 ENGINE STALLS WHEN SHIFTED TO D RANGE, OR IN R POSITION [SJ6A-EL].</b> )
25	<ul style="list-style-type: none"> <li>Engine stalls when driving at slow speeds or stopping</li> </ul>	<ul style="list-style-type: none"> <li>Engine stalls when brake pedal is depressed while driving at low speed or stopping.</li> </ul>	(See <b>NO.25 ENGINE STALLS WHEN DRIVING AT SLOW SPEED OR STOPPING [SJ6A-EL].</b> )
26	<ul style="list-style-type: none"> <li>Starter does not work</li> </ul>	<ul style="list-style-type: none"> <li>Starter does not work even when P or N position is selected.</li> </ul>	(See <b>NO.26 STARTER DOES NOT WORK [SJ6A-EL].</b> )
27	<ul style="list-style-type: none"> <li>Gear position indicator light does not illuminate in D or M range</li> </ul>	<ul style="list-style-type: none"> <li>Gear position indicator light in instrument cluster does not illuminate in D or M range with ignition switch at ON.</li> </ul>	(See <b>NO.27 GEAR POSITION INDICATOR LIGHT DOES NOT ILLUMINATE IN D OR M RANGE[SJ6A-EL].</b> )
28	<ul style="list-style-type: none"> <li>Gear position indicator light illuminate in P, R and N position</li> </ul>	<ul style="list-style-type: none"> <li>Gear position indicator light in instrument cluster illuminates in P, N or R positions with ignition switch at ON.</li> </ul>	(See <b>NO.28 GEAR POSITION INDICATOR LIGHT ILLUMINATE IN P, R AND N POSITION[SJ6A-EL].</b> )
29	<ul style="list-style-type: none"> <li>Does not upshift</li> </ul>	<ul style="list-style-type: none"> <li>Gear position indicator</li> </ul>	(See <b>NO.29 DOES NOT</b>



	in M range	light in instrument cluster illuminates but vehicle does not upshift when selector lever is pushed to "+" side or steering shift switch "UP" is pulled.	<b>UPSHIFT IN M RANGE [SJ6A-EL].)</b>
30	<ul style="list-style-type: none"><li>Does not downshift in M range</li></ul>	<ul style="list-style-type: none"><li>Gear position indicator light in instrument cluster illuminates but vehicle does not downshift when selector lever is pushed to "-" side or steering shift switch "DOWN" is pushed.</li></ul>	(See <b>NO.30 DOES NOT DOWNSHIFT IN M RANGE [SJ6A-EL].)</b>

X : Applicable

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Cause of trouble	Down swi "DOWN" :		VSS		Turbine se		TFT sensi		Starter lock relay	Shift solenoid A	Shift solenoid B	Shift solenoid C	Shift solenoid D	Shift solenoid E	Line pressure con	TCC control solen	Shift solenoid F	Shift solenoid G
	No signal input	Abnormal signal input	No signal input	Abnormal signal input	No signal input	Abnormal signal input	Open/short	Malfunction signal input	Open/short	Open/short	Open/short	Open/short	Open/short	Open/short	Open/short	Open/short	Open/short	Open/short

X : Applicable

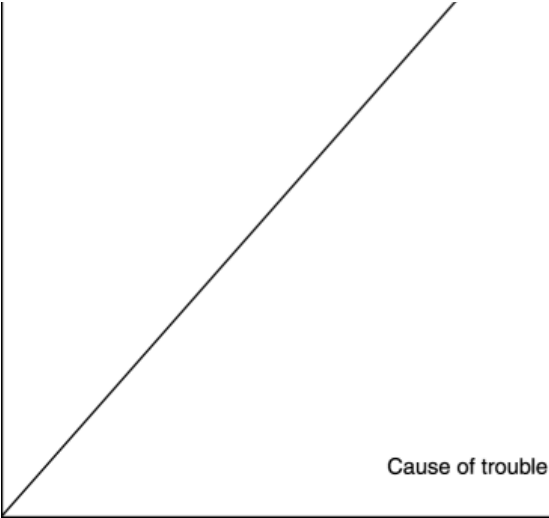
1	Vehicle does not move in D range, or in R position	X	X		X		X	X	X	X		X	X			X	
2	Vehicle moves in N position	X	X						X	X		X				X	
3	Vehicle moves in P position, or parking gear does not disengage when P is disengaged																
4	Excessive creep																
5	No creep at all		X		X			X	X			X	X			X	
6	Low maximum speed and poor acceleration	X	X	X	X	X		X	X	X	X	X	X				
7	No shifting	X	X	X	X	X	X	X	X	X	X	X	X		X	X	
8	Does not shift to 6GR	X		X	X								X				
9	Abnormal shifting	X	X	X	X	X							X				
10	Frequent shifting	X	X	X	X	X							X				
11	Shift point is high or low																
12	Torque converter clutch (TCC) non-operation													X			
13	No kickdown																
14	Engine flares up or slips when upshifting or downshifting	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
15	Engine flares up or slips when accelerating vehicle	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
16	Judder upon torque converter clutch (TCC) operation	X												X			
17	Excessive shift shock from N to D or N to R position/range	X	X		X												
18	Excessive shift shock is given when upshifting and downshifting	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
19	Excessive shift shock on torque converter clutch (TCC)	X												X			
20	Noise occurs at idle when vehicle is stopped in all positions/ranges	X	X	X	X	X											
21	Noise occurs at idle when vehicle is stopped in D range, or in R position	X	X	X	X	X											
22	No engine braking	X											X				
23	Transmission overheats																X
24	Engine stalls when shifted to D range, or in R position													X			
25	Engine stalls when driving at slow speeds or stopping													X			
26	Starter does not work																
27	Gear position indicator light does not illuminate in D or M range																
28	Gear position indicator light illuminate in P, R and N position																
29	Does not upshift in M range																
30	Does not downshift in M range																

Symptom item

Hydraulic system components

Control valve body

Hydraulic circuit



Valve body spool is not operating properly	
C1 accumulator is not operating properly	
C2 accumulator is not operating properly	
C3 accumulator is not operating properly	
B3 accumulator is not operating properly	
Clogging	Shift solenoid A hydraulic circuit
Clogging	Shift solenoid B hydraulic circuit
Clogging	Shift solenoid C hydraulic circuit
Clogging	Shift solenoid D hydraulic circuit
Clogging	Shift solenoid E hydraulic circuit
Clogging	Line pressure control solenoid hy
Clogging	TCC control solenoid hydraulic ci
Clogging	Shift solenoid F hydraulic circuit
Clogging	Shift solenoid G hydraulic circuit
ATF cooler is not operating properly	

1	Vehicle does not move in D range, or in R position	X		X	X			X				
2	Vehicle moves in N position		X	X								
3	Vehicle moves in P position, or parking gear does not disengage when P is disengaged											
4	Excessive creep									X		
5	No creep at all		X		X			X				
6	Low maximum speed and poor acceleration	X	X		X						X	
7	No shifting		X					X				
8	Does not shift to 6GR	X	X		X							
9	Abnormal shifting	X	X					X				
10	Frequent shifting	X	X					X				
11	Shift point is high or low											
12	Torque converter clutch (TCC) non-operation					X	X					
13	No kickdown							X				
14	Engine flares up or slips when upshifting or downshifting	X	X									
15	Engine flares up or slips when accelerating vehicle	X	X									
16	Judder upon torque converter clutch (TCC) operation				X	X						
17	Excessive shift shock from N to D or N to R position/range		X						X		X	
18	Excessive shift shock is given when upshifting and downshifting	X	X					X	X	X		
19	Excessive shift shock on torque converter clutch (TCC)	X	X		X	X						
20	Noise occurs at idle when vehicle is stopped in all positions/ranges											
21	Noise occurs at idle when vehicle is stopped in D range, or in R position											
22	No engine braking	X	X									
23	Transmission overheats											
24	Engine stalls when shifted to D range, or in R position				X		X					X
25	Engine stalls when driving at slow speeds or stopping						X					X
26	Starter does not work											
27	Gear position indicator light does not illuminate in D or M range											
28	Gear position indicator light illuminate in P, R and N position											
29	Does not upshift in M range											
30	Does not downshift in M range											
Symptom item		Powertrain										
		Slipping (clutch, brake)	Burnt (clutch, brake)	One-way clutch is not operated properly	Torque converter is not operating properly	TCC is cracking or peeling	TCC is not operating properly	TCM malfunction	Loose parts installation (engine or transmission mounts, propeller shaft or suspension)	Insufficient battery voltage	Engine speed high	Engine output low
Cause of trouble												

## 2008 - MX-5 - Transmission/Transaxle

### NO.1 VEHICLE DOES NOT MOVE IN D RANGE, OR IN R POSITION [SJ6A-EL]

1	Vehicle does not move in D range, or in R position
DESCRIPTION	<ul style="list-style-type: none"> <li>Vehicle does not move when accelerator pedal is depressed.</li> </ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>If the vehicle does not move in D range or R position, basically, the malfunction is in the AT. (Vehicle will move even with a malfunction in the TCM.) Since a malfunction is in the sensor circuit or output circuit is the cause of the malfunction in the AT, inspect the sensors, output circuit, and the related wiring harnesses. <ul style="list-style-type: none"> <li>Clutch slippage, worn (D range-C1 clutch, One-way clutch, R position-C3 clutch, B4 brake, One-way clutch) <ul style="list-style-type: none"> <li>Line pressure low</li> <li>Shift solenoid A malfunction</li> <li>Shift solenoid B malfunction</li> <li>Shift solenoid C malfunction</li> <li>Shift solenoid E malfunction</li> <li>Line pressure control solenoid malfunction</li> <li>Shift solenoid G malfunction</li> <li>Sensor GND malfunction</li> <li>Body GND malfunction</li> <li>Control valve body malfunction</li> </ul> </li> <li>Selector lever malfunction</li> <li>Parking mechanism not operating properly</li> <li>Torque converter malfunction</li> <li>TCM malfunction</li> <li>Foreign materials or water mixed in ATF</li> <li>Improper ATF amount</li> </ul> </li> </ul> <p><b>NOTE:</b></p>

- Before following the troubleshooting steps, make sure that the Automatic Transmission On-Board Diagnostic and Automatic Transmission Basic Inspection are conducted. (See **BASIC INSPECTION [SJ6A-EL]**.)

## Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<ul style="list-style-type: none"> <li>• When the vehicle is stopped on a flat, level road and the engine off, does the vehicle move when pushed? (in D range or N, R positions with the brake pedal released)</li> </ul>	Yes	Go to the next step.
		No	Inspect for parking mechanism.
2	<ul style="list-style-type: none"> <li>• Start the engine.</li> <li>• Does vehicle move when selector lever in between N position and D range?</li> </ul>	Yes	Inspect or adjust selector lever.  (See <b>SELECTOR LEVER INSPECTION</b> .)
		No	Go to the next step.
3	<ul style="list-style-type: none"> <li>• Stop the engine.</li> <li>• Inspect following solenoid. (See <b>SOLENOID VALVE INSPECTION [SJ6A-EL]</b>.) <ul style="list-style-type: none"> <li>▪ Shift solenoid C</li> <li>▪ Shift solenoid D</li> <li>▪ Shift solenoid E</li> <li>▪ Shift solenoid F</li> <li>▪ Line pressure control solenoid</li> </ul> </li> <li>• Are these normal?</li> </ul>	Yes	Replace the AT (clutch slippage, worn)  (See <b>AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL]</b> .)
		No	Inspect the coupler component.  If normal, replace the control valve body.  (See <b>CONTROL VALVE BODY REMOVAL [SJ6A-EL]</b> .)  (See <b>CONTROL VALVE BODY INSTALLATION [SJ6A-EL]</b> .)
4	<ul style="list-style-type: none"> <li>• Verify test results. <ul style="list-style-type: none"> <li>▪ If normal, return to the diagnostic index to service any additional symptoms.</li> <li>▪ If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.</li> </ul> </li> <li>• If the vehicle is repaired, troubleshooting completed.</li> </ul>		



- If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.

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NO.2 VEHICLE MOVES IN N POSITION [SJ6A-EL]

2	Vehicle moves in N position	
DESCRIPTION	<ul style="list-style-type: none"><li>• Vehicle creeps in N position.</li><li>• Vehicle creeps if brake pedal is not depressed in N position.</li></ul>	
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• If the vehicle moves in N position, basically, the malfunction is in the AT. Since a malfunction in the sensor circuit or output circuit is the cause of the malfunction in the AT, inspect the sensors, output circuit, and the related wiring harnesses.<ul style="list-style-type: none"><li>▪ Clutch burnt (C1 clutch, C4 clutch, One-way clutch)<ul style="list-style-type: none"><li>• Line pressure low</li><li>• Shift solenoid B malfunction</li><li>• Shift solenoid C malfunction</li><li>• Shift solenoid E malfunction</li><li>• Shift solenoid G malfunction</li><li>• Control valve body malfunction</li></ul></li><li>▪ Selector lever position disparity (Although the selector indicator shows N position, the hydraulic circuit shows D range or R position)<ul style="list-style-type: none"><li>• TR switch mis-adjustment</li></ul></li></ul></li></ul> <p>NOTE:</p> <ul style="list-style-type: none"><li>• Before following the troubleshooting steps, make sure that the Automatic Transmission On-Board Diagnostic and Automatic Transmission Basic Inspection are conducted. (See <b>BASIC INSPECTION [SJ6A-EL]</b>.)</li></ul>	

Diagnostic procedure

STEP	INSPECTION		ACTION
1	<ul style="list-style-type: none"><li>• Does the vehicle creep when selector lever is moved slightly in N position?</li></ul>	Yes	Go to the next step.

		No	Inspect and adjust the selector lever and TR switch.  (See <a href="#">SELECTOR LEVER INSPECTION</a> .)  (See <a href="#">TRANSMISSION RANGE (TR) SWITCH INSPECTION [SJ6A-EL]</a> .)  (See <a href="#">TRANSMISSION RANGE (TR) SWITCH ADJUSTMENT [SJ6A-EL]</a> .)
2	<ul style="list-style-type: none"> <li>Inspect following solenoid. (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.) <ul style="list-style-type: none"> <li>Shift solenoid B</li> <li>Shift solenoid C</li> <li>Shift solenoid E</li> <li>Shift solenoid G</li> </ul> </li> <li>Are these solenoids normal?</li> </ul>	Yes	Replace the AT (clutch slippage, worm).  (See <a href="#">AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL]</a> .)
		No	Inspect the coupler component.  If normal, replace the control valve body.  (See <a href="#">CONTROL VALVE BODY REMOVAL [SJ6A-EL]</a> .)  (See <a href="#">CONTROL VALVE BODY INSTALLATION [SJ6A-EL]</a> .)
3	<ul style="list-style-type: none"> <li>Verify test results. <ul style="list-style-type: none"> <li>If normal, return to the diagnostic index to service any additional symptoms.</li> <li>If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. <ul style="list-style-type: none"> <li>If the vehicle is repaired, troubleshooting completed.</li> <li>If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.</li> </ul> </li> </ul> </li> </ul>		

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NO.3 VEHICLE MOVES IN P POSITION, OR PARKING GEAR DOES NOT DISENGAGE WHEN P IS DISENGAGED [SJ6A-EL]

3	Vehicle moves in P position, or parking gear does not disengage when P is disengaged
DESCRIPTION	<ul style="list-style-type: none"><li>• Vehicle rolls on a downward slope in P position.</li><li>• Tires are locked when P is disengaged. Vehicle does not move in D range, and R position when the accelerator pedal is depressed, and the engine remains in a stalled condition.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Parking mechanism malfunction (May have effect on noise or shock from transmission)</li><li>• Improper adjustment of selector lever</li><li>• If the vehicle moves in N position, perform No.2 "VEHICLE MOVES IN N POSITION"</li></ul>

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### NO.4 EXCESSIVE CREEP [SJ6A-EL]

<b>4</b>	<b>Excessive creep</b>
<b>DESCRIPTION</b>	<ul style="list-style-type: none"><li>• Vehicle accelerates in D range, and R position when accelerator pedal is not depressed.</li></ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"><li>• Engine idle speed is high (transmission system is not cause of problem)</li><li>• Go to No.9 "FAST IDLE/RUNS ON"</li></ul> <p>(See <a href="#">NO.9 FAST IDLE/RUNS ON [LF].</a>)</p>

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NO.5 NO CREEP AT ALL [SJ6A-EL]

5	No creep at all
DESCRIPTION	<ul style="list-style-type: none"><li>• Vehicle does not move in D range and R position when idling on a flat paved road.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Either engine output low or there is clutch slippage.<ul style="list-style-type: none"><li>▪ Clutch burnt (C1 clutch, C4 clutch)<ul style="list-style-type: none"><li>• Line pressure low</li><li>• Shift solenoid B malfunction</li><li>• Shift solenoid C malfunction</li><li>• Shift solenoid E malfunction</li><li>• Line pressure control solenoid malfunction</li><li>• Shift solenoid G malfunction</li><li>• Body GND malfunction</li><li>• Control valve body malfunction</li></ul></li><li>▪ Transmission fixed in 4GR or 5GR (Operation of fail-safe function)<ul style="list-style-type: none"><li>• Short or open circuit in wiring harness</li><li>• Poor connection of connector</li><li>• Malfunction of electronic parts of output and input system</li></ul></li><li>▪ There is no engine torque<ul style="list-style-type: none"><li>• Torque converter malfunction</li></ul></li><li>▪ Foreign material or water mixed in ATF</li><li>▪ Excessive or low amount of ATF</li><li>▪ TCM malfunction</li></ul></li></ul> <p>NOTE:</p>

- Before following the troubleshooting steps, make sure that the Automatic Transmission On-Board Diagnostic and Automatic Transmission Basic Inspection are conducted. (See **BASIC INSPECTION [SJ6A-EL]**.)

## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>• Does the vehicle creep in P and/or N position?</li> </ul>	Yes Inspect or adjust the selector lever. (See <b>SELECTOR LEVER INSPECTION</b> .)
		No Go to the next step.
2	<ul style="list-style-type: none"> <li>• Stop the engine.</li> <li>• Inspect following solenoid. (See <b>SOLENOID VALVE INSPECTION [SJ6A-EL]</b>.) <ul style="list-style-type: none"> <li>▪ Shift solenoid B</li> <li>▪ Shift solenoid C</li> <li>▪ Shift solenoid E</li> <li>▪ Shift solenoid G</li> <li>▪ Line pressure control solenoid</li> </ul> </li> <li>• Are these solenoids normal?</li> </ul>	Yes Go to the next step.
		No Inspect the coupler component. If normal, replace the control valve body. (See <b>CONTROL VALVE BODY REMOVAL [SJ6A-EL]</b> .) (See <b>CONTROL VALVE BODY INSTALLATION [SJ6A-EL]</b> .)
3	<ul style="list-style-type: none"> <li>• Remove the torque converter. (See <b>TORQUE CONVERTER REMOVAL/INSTALLATION [SJ6A-EL]</b>.)</li> <li>• Inspect the torque converter.</li> <li>• Is the torque converter normal?</li> </ul>	Yes Inspect the ATF condition. <ul style="list-style-type: none"> <li>• If a large amount of metal specks are found, replace the transmission. (See <b>AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL]</b>.)</li> <li>• If a large amount of metal specks are not found, replace the control valve body. (See <b>CONTROL VALVE BODY REMOVAL [SJ6A-EL]</b>.) (See <b>CONTROL VALVE BODY</b></li> </ul>

			INSTALLATION [SJ6A-EL].)
		No	Replace the torque converter.
4	<ul style="list-style-type: none"><li>• Verify test results.<ul style="list-style-type: none"><li>▪ If normal, return to the diagnostic index to service any additional symptoms.</li><li>▪ If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.<ul style="list-style-type: none"><li>• If the vehicle is repaired, troubleshooting completed.</li><li>• If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.</li></ul></li></ul></li></ul>		



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NO.6 LOW MAXIMUM SPEED AND POOR ACCELERATION [SJ6A-EL]

6	Low maximum speed and poor acceleration
DESCRIPTION	<ul style="list-style-type: none"><li>• Vehicle acceleration is poor at start.</li><li>• Delayed acceleration when accelerator pedal is depressed while driving.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• If the clutch is stuck or does not stay in 4GR, malfunction is in engine circuit.<ul style="list-style-type: none"><li>▪ Clutch slippage, burnt (C1 clutch, C2 clutch, C3 clutch, B1 brake, B2 brake, B3 brake, B4 brake)<ul style="list-style-type: none"><li>• Line pressure low</li><li>• Line pressure control solenoid malfunction</li><li>• Control valve body malfunction</li></ul></li><li>▪ Transmission fixed in 4GR or 5GR (Operation of fail-safe function)<ul style="list-style-type: none"><li>• Short or open circuit in wiring harness</li><li>• Poor connection of connector</li><li>• Malfunction of electronic parts of output and input system</li></ul></li><li>▪ Insufficient starting torque (Suspected when in-gear, shift control and engine circuit are normal)<ul style="list-style-type: none"><li>• Torque converter malfunction (Poor operation, stuck)</li></ul></li><li>▪ Engine output low</li></ul></li></ul> <p>NOTE:</p> <ul style="list-style-type: none"><li>• Before following the troubleshooting steps, make sure that the Automatic Transmission On-Board Diagnostic and Automatic Transmission Basic Inspection are conducted. (See <b>BASIC INSPECTION [SJ6A-EL]</b>.)</li></ul>

Diagnostic procedure

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STEP	INSPECTION	ACTION	
1	<ul style="list-style-type: none"> <li>With the ignition switch at the ON position, does the gear position indicator light indication correspond to the selector lever position?</li> </ul>	Yes	Go to the next step.
		No	Go to No.27 "GEAR POSITION INDICATOR LIGHT DOES NOT ILLUMINATE IN M RANGE", or No.28 "GEAR POSITION INDICATOR LIGHT ILLUMINATES IN D RANGE OR P, N, R POSITIONS".
2	<ul style="list-style-type: none"> <li>Go to No.12 "LACK/LOSS OF POWER-ACCELERATION/CRUISE". (See <b>NO.12 LACK/LOSS OF POWER-ACCELERATION/CRUISE [LF]</b>.)</li> <li>Does engine control system normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts according to the inspection results.
3	<ul style="list-style-type: none"> <li>Stop the engine.</li> <li>Inspect line pressure control solenoid. (See <b>SOLENOID VALVE INSPECTION [SJ6A-EL]</b>.)</li> <li>Is the line pressure control solenoid normal?</li> </ul>	Yes	Go to the next step.
		No	Inspect the coupler component.  If normal, replace the control valve body. (See <b>CONTROL VALVE BODY REMOVAL [SJ6A-EL]</b> .) (See <b>CONTROL VALVE BODY INSTALLATION [SJ6A-EL]</b> .)
4	<ul style="list-style-type: none"> <li>Remove the torque converter. (See <b>TORQUE CONVERTER REMOVAL/INSTALLATION [SJ6A-EL]</b>.)</li> <li>Inspect the torque converter.</li> <li>Is the torque converter normal?</li> </ul>	Yes	Inspect the ATF condition. <ul style="list-style-type: none"> <li>If a large amount of metal specks are found, replace the transmission. (See <b>AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL]</b>.)</li> <li>If a large amount of metal specks are not found, replace the control valve body. (See <b>CONTROL VALVE BODY REMOVAL [SJ6A-EL]</b>.) (See <b>CONTROL VALVE BODY INSTALLATION [SJ6A-EL]</b>.)</li> </ul>
		No	Replace the torque converter.
5	<ul style="list-style-type: none"> <li>Verify test results. <ul style="list-style-type: none"> <li>If normal, return to the diagnostic index to service any additional</li> </ul> </li> </ul>		

symptoms.

- If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.
  - If the vehicle is repaired, troubleshooting completed.
  - If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.

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NO.7 NO SHIFTING [SJ6A-EL]

7	No shifting
DESCRIPTION	<ul style="list-style-type: none"><li>• Single shift range only.</li><li>• Sometimes it shifts correctly.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• When the gear position is fixed in 4GR or 5GR due to the fail-safe operation, malfunction is in the AT.<ul style="list-style-type: none"><li>▪ Clutch burnt (C1 clutch, C2 clutch, C3 clutch, B1 brake, B2 brake, B3 brake, B4 brake)<ul style="list-style-type: none"><li>• Line pressure low</li><li>• Incorrect throttle position signal</li><li>• Incorrect accelerator pedal position signal</li><li>• Incorrect engine speed signal</li><li>• Incorrect engine coolant temperature signal</li><li>• Incorrect engine torque signal</li><li>• VSS malfunction</li><li>• Turbine sensor malfunction</li><li>• Sensor GND malfunction</li><li>• Shift solenoid A malfunction</li><li>• Shift solenoid B malfunction</li><li>• Shift solenoid C malfunction</li><li>• Shift solenoid D malfunction</li><li>• Shift solenoid E malfunction</li><li>• Line pressure control solenoid malfunction</li><li>• Shift solenoid F malfunction</li><li>• Shift solenoid G malfunction</li></ul></li></ul></li></ul>

	<ul style="list-style-type: none"> <li>Control valve body malfunction           <ul style="list-style-type: none"> <li>4GR or 5GR is fixed (Operation in fail-safe function)               <ul style="list-style-type: none"> <li>Short or open circuit in wiring harness</li> <li>Poor connection of connector</li> <li>Poor ground of shift solenoid</li> <li>Malfunction of electronic parts of output and input system</li> </ul> </li> </ul> </li> <li>TFT sensor malfunction</li> <li>TR switch malfunction</li> <li>TCM malfunction</li> </ul>
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### Diagnostic procedure

STEP	INSPECTION		ACTION
1	<ul style="list-style-type: none"> <li>With the ignition switch at the ON position, does the gear position indicator light indication corresponded to the selector lever position?</li> </ul>	Yes	Go to the next step.
		No	Go to No.27 "GEAR POSITION INDICATOR LIGHT DOES NOT ILLUMINATE IN M RANGE", or No.28 "GEAR POSITION INDICATOR LIGHT ILLUMINATES IN D RANGE OR P, N, R POSITIONS".
2	<ul style="list-style-type: none"> <li>Access the following PCM PIDs using the M-MDS.               <ul style="list-style-type: none"> <li>RPM</li> <li>APP</li> <li>TP</li> <li>ECT</li> <li>ENG_TRQ</li> </ul> </li> <li>Are PIDs value normal?</li> </ul>	Yes	Go to the next step.
		No	Inspect and repair suspected PID related part.
3	<ul style="list-style-type: none"> <li>Inspect the TFT sensor. (See <b>TRANSMISSION FLUID TEMPERATURE (TFT) SENSOR INSPECTION [SJ6A-EL].</b>)</li> <li>Is the TFT sensor normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the TFT sensor.
4	<ul style="list-style-type: none"> <li>Stop the engine.</li> <li>Inspect following solenoid.</li> </ul>	Yes	Inspect the ATF condition. <ul style="list-style-type: none"> <li>If a large amount of metal specks</li> </ul>

	<p>(See <b>SOLENOID VALVE INSPECTION [SJ6A-EL].</b>)</p> <ul style="list-style-type: none"><li>▪ Shift solenoid A</li><li>▪ Shift solenoid B</li><li>▪ Shift solenoid C</li><li>▪ Shift solenoid D</li><li>▪ Shift solenoid E</li><li>▪ Line pressure control solenoid</li><li>▪ Shift solenoid F</li><li>▪ Shift solenoid G</li></ul> <ul style="list-style-type: none"><li>• Are they normal?</li></ul>		<p>are found, replace the transmission.</p> <p>(See <b>AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL].</b>)</p> <ul style="list-style-type: none"><li>• If a large amount of metal specks are not found, replace the control valve body.</li></ul> <p>(See <b>CONTROL VALVE BODY REMOVAL [SJ6A-EL].</b>)</p> <p>(See <b>CONTROL VALVE BODY INSTALLATION [SJ6A-EL].</b>)</p>
		No	<p>Replace the control valve body.</p> <p>(See <b>CONTROL VALVE BODY REMOVAL [SJ6A-EL].</b>)</p> <p>(See <b>CONTROL VALVE BODY INSTALLATION [SJ6A-EL].</b>)</p>
5	<ul style="list-style-type: none"><li>• Verify test results.<ul style="list-style-type: none"><li>▪ If normal, return to the diagnostic index to service any additional symptoms.</li><li>▪ If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.<ul style="list-style-type: none"><li>• If the vehicle is repaired, troubleshooting completed.</li><li>• If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.</li></ul></li></ul></li></ul>		

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### NO.8 DOES NOT SHIFT TO 6GR [SJ6A-EL]

8	Does not shift to 6GR
DESCRIPTION	<ul style="list-style-type: none"> <li>Vehicle does not upshift from 5GR to 6GR even though vehicle speed is increased.</li> <li>Vehicle does not shift to 6GR even though accelerator pedal is released in D range at <b>80 km/h {50 mph}</b>.</li> </ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>Basically, TCC does not operate when the fail-safe is operating. Verify the DTC at first. If the TCC operates when driving at high speeds only, the malfunction (improper adjustment) is in the M range switch circuit or TR switch circuit. <ul style="list-style-type: none"> <li><b>CAUTION:</b> <ul style="list-style-type: none"> <li>If the TCC is stuck, inspect it. In addition, inspect the oil cooler for foreign particles which may have mixed in with the ATF.</li> </ul> </li> <li>C2 clutch, C3 clutch, B2 brake slippage, burnt <ul style="list-style-type: none"> <li>Line pressure low</li> <li>Incorrect throttle position signal</li> <li>Incorrect accelerator pedal position signal</li> <li>Incorrect engine speed signal</li> <li>Incorrect engine coolant temperature signal</li> <li>Incorrect engine torque signal</li> <li>VSS malfunction</li> <li>Turbine sensor malfunction</li> <li>Sensor GND malfunction</li> </ul> </li> <li>TFT sensor malfunction <ul style="list-style-type: none"> <li>Short or open circuit in wiring harness</li> <li>Poor connection of connector</li> <li>Sensor malfunction</li> </ul> </li> </ul> </li> </ul>

- TR switch malfunction
  - Selector lever adjustment incorrect
  - TR switch adjustment incorrect
- Shift solenoid A, shift solenoid B, shift solenoid C, shift solenoid D, shift solenoid G, line pressure control solenoid malfunction
  - Short or open circuit in wiring harness
  - Poor connection of connector
  - Solenoid valve stuck
- M range switch malfunction
  - Selector lever adjustment incorrect
  - Short or open circuit in wiring harness
- Torque converter malfunction
- Control valve body malfunction

**NOTE:**

- Before following the troubleshooting steps, make sure that the Automatic Transmission On-Board Diagnostic and Automatic Transmission Basic Inspection are conducted. (See **BASIC INSPECTION [SJ6A-EL]**.)

**Diagnostic procedure**

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>• With the ignition switch at the ON position.</li> <li>• Does the gear position indicator light indication correspond to selector lever position?</li> </ul>	Yes Go to the next step.
		No Go to No.27 "GEAR POSITION INDICATOR LIGHT DOES NOT ILLUMINATE IN M RANGE", or No.28 "GEAR POSITION INDICATOR LIGHT ILLUMINATES IN D RANGE OR P, N, R POSITIONS".
2	<ul style="list-style-type: none"> <li>• Access the following PCM PIDs using the M-MDS.               <ul style="list-style-type: none"> <li>▪ RPM</li> <li>▪ APP</li> <li>▪ TP</li> <li>▪ ECT</li> <li>▪ ENG_TRQ</li> </ul> </li> <li>• Are PIDs value normal?</li> </ul>	Yes Go to the next step.
		No Inspect and repair suspected PID related part.



3	<ul style="list-style-type: none"> <li>Inspect the TFT sensor.  (See <b>TRANSMISSION FLUID TEMPERATURE (TFT) SENSOR INSPECTION [SJ6A-EL].</b>)</li> <li>Is the TFT sensor normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the TFT sensor.
4	<ul style="list-style-type: none"> <li>Drive the vehicle in D range and inspect following: <ul style="list-style-type: none"> <li>1–2 shift up and down</li> <li>2–3 shift up and down</li> <li>3–4 shift up and down</li> <li>4–5 shift up and down</li> <li>5–6 shift up and down</li> </ul> </li> <li>Are all shift-up and shift-down possible?</li> </ul>	Yes	Go to the next step.
		No	<b>No shift at all:</b> <ul style="list-style-type: none"> <li>Go to No.7 "NO SHIFTING".</li> </ul> <b>Abnormal shift:</b> <ul style="list-style-type: none"> <li>Go to No.9 "ABNORMAL SHIFTING".</li> </ul>
5	<ul style="list-style-type: none"> <li>Stop the engine.</li> <li>Inspect following solenoid.  (See <b>SOLENOID VALVE INSPECTION [SJ6A-EL].</b>) <ul style="list-style-type: none"> <li>Shift solenoid A</li> <li>Shift solenoid B</li> <li>Shift solenoid C</li> <li>Shift solenoid D</li> </ul> </li> </ul>	Yes	Go to the next step.
		No	Inspect for shift solenoid stuck.  (See <b>SOLENOID VALVE INSPECTION [SJ6A-EL].</b> )

	<ul style="list-style-type: none"> <li>▪ Shift solenoid F</li> <li>▪ Line pressure control solenoid</li> </ul> <ul style="list-style-type: none"> <li>• Are they normal?</li> </ul>		
6	<ul style="list-style-type: none"> <li>• Remove the torque converter.</li> </ul> <p>(See <b>TORQUE CONVERTER REMOVAL/INSTALLATION [SJ6A-EL].</b>)</p> <ul style="list-style-type: none"> <li>• Inspect the torque converter.</li> <li>• Is the torque converter normal?</li> </ul>	Yes	<p>Inspect the ATF condition.</p> <ul style="list-style-type: none"> <li>• If a large amount of metal specks are found, replace the transmission.</li> </ul> <p>(See <b>AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL].</b>)</p> <ul style="list-style-type: none"> <li>• If a large amount of metal specks are not found, replace the control valve body.</li> </ul> <p>(See <b>CONTROL VALVE BODY REMOVAL [SJ6A-EL].</b>)</p> <p>(See <b>CONTROL VALVE BODY INSTALLATION [SJ6A-EL].</b>)</p>
		No	Replace the torque converter.
7	<ul style="list-style-type: none"> <li>• Verify test results.</li> </ul> <ul style="list-style-type: none"> <li>▪ If normal, return to the diagnostic index to service any additional symptoms.</li> <li>▪ If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. <ul style="list-style-type: none"> <li>• If the vehicle is repaired, troubleshooting completed.</li> <li>• If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.</li> </ul> </li> </ul>		

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### NO.9 ABNORMAL SHIFTING [SJ6A-EL]

9	Abnormal shifting
DESCRIPTION	<ul style="list-style-type: none"> <li>Shift incorrectly (incorrect shift pattern).</li> </ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>There is a malfunction in the signal circuit which controls shifting (Throttle position signal, turbine sensor, VSS), the control valve is stuck, or the clutch circuit is stuck. <ul style="list-style-type: none"> <li>Clutch slippage, burnt (C1 clutch, C2 clutch, C3 clutch, B1 brake, B2 brake, B3 brake) <ul style="list-style-type: none"> <li>Line pressure low</li> <li>Incorrect throttle position signal</li> <li>Incorrect accelerator pedal position signal</li> <li>Incorrect engine speed signal</li> <li>Incorrect engine coolant temperature signal</li> <li>Incorrect engine torque signal</li> <li>VSS malfunction</li> <li>Turbine sensor malfunction</li> <li>Sensor GND malfunction</li> <li>TFT sensor malfunction</li> <li>Line pressure control solenoid malfunction</li> <li>Body GND malfunction</li> <li>Control valve body malfunction</li> <li>TCM malfunction</li> </ul> </li> </ul> </li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>Before following the troubleshooting steps, make sure that the Automatic Transmission On-Board Diagnostic and Automatic Transmission Basic Inspection are conducted. (See <b>BASIC INSPECTION [SJ6A-EL]</b>.)</li> </ul>

## Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<ul style="list-style-type: none"> <li>Inspect for continuity between the TCM terminal 1P, 1X and battery negative terminal.</li> <li>Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace ground circuit.
2	<ul style="list-style-type: none"> <li>Access the following PCM PIDs using the M-MDS. <ul style="list-style-type: none"> <li>RPM</li> <li>APP</li> <li>TP</li> <li>ECT</li> <li>ENG_TRQ</li> </ul> </li> <li>Are PIDs value normal?</li> </ul>	Yes	Go to the next step.
		No	Inspect and repair suspected PID related part.
3	<ul style="list-style-type: none"> <li>Inspect the TFT sensor. (See <b>TRANSMISSION FLUID TEMPERATURE (TFT) SENSOR INSPECTION [SJ6A-EL].</b>)</li> <li>Is the TFT sensor normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the TFT sensor.
4	<ul style="list-style-type: none"> <li>Inspect the line pressure control solenoid. (See <b>SOLENOID VALVE INSPECTION [SJ6A-EL].</b>)</li> <li>Is the line pressure control solenoid normal?</li> </ul>	Yes	Inspect the TCM terminal for bend, damage, corrosion or poor contact.
		No	Inspect the coupler component.  If normal, replace the control valve body.  (See <b>CONTROL VALVE BODY REMOVAL [SJ6A-EL].</b> )  (See <b>CONTROL VALVE BODY INSTALLATION [SJ6A-EL].</b> )
5	<ul style="list-style-type: none"> <li>Verify test results. <ul style="list-style-type: none"> <li>If normal, return to the diagnostic index to service any additional symptoms.</li> <li>If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. <ul style="list-style-type: none"> <li>If the vehicle is repaired, troubleshooting</li> </ul> </li> </ul> </li> </ul>		

completed.

- If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.

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NO.10 FREQUENT SHIFTING [SJ6A-EL]

10	Frequent shifting
DESCRIPTION	<ul style="list-style-type: none"><li>Downshifting occurs suddenly even when accelerator pedal is depressed slightly in D range.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>The malfunctioning circuit is basically the same as No.9 "ABNORMAL SHIFTING". However, a malfunction of the input signal to the accelerator pedal position sensor, TP sensor, turbine sensor, VSS (including the sensor GND, sensor wiring harness and connector), or clutch slippage (clutch stuck, low pressure in line) may also be the cause.</li></ul>

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### NO.11 SHIFT POINT IS HIGH OR LOW [SJ6A-EL]

<b>11</b>	<b>Shift point is high or low</b>
<b>DESCRIPTION</b>	<ul style="list-style-type: none"><li>• Shift point considerably different from automatic shift diagram.</li><li>• Shift delays when accelerating.</li><li>• Shift occurs quickly when accelerating and engine speed does not increase.</li></ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"><li>• If the transmission does not shift abnormally, there is a malfunction of the input signal to the TP sensor, turbine sensor, or VSS.</li><li>• If the engine speed is high or low, regardless of normal shifting, inspect the tachometer.</li><li>• Verify that the output signals of the accelerator pedal position sensor and TP sensor change linearly.</li></ul>

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### NO.12 TORQUE CONVERTER CLUTCH (TCC) NON-OPERATION [SJ6A-EL]

12	Torque converter clutch (TCC) non-operation
DESCRIPTION	<ul style="list-style-type: none"><li>TCC does not operate when vehicle reaches TCC operation range.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Basically, TCC does not operate when the fail-safe is operating. Verify the DTC at first. If the TCC operates when driving at high speeds only, the malfunction (improper adjustment) is in the M range switch circuit or TR switch circuit. <b>CAUTION:</b><ul style="list-style-type: none"><li>If the TCC is stuck, inspect it. In addition, inspect the oil cooler for foreign particles which may have mixed in with the ATF.</li></ul></li><li>TCC slippage, burnt<ul style="list-style-type: none"><li>Line pressure low<ul style="list-style-type: none"><li>Incorrect throttle position signal</li><li>Incorrect accelerator pedal position signal</li><li>Incorrect engine speed signal</li><li>Incorrect engine coolant temperature signal</li><li>Incorrect engine torque signal</li><li>Turbine sensor malfunction</li><li>VSS malfunction</li><li>Output solenoid valve system malfunction (Sticking)</li><li>TCC control solenoid malfunction</li><li>Control valve body system malfunction (Poor operation, sticking)</li><li>TCC hydraulic pressure system malfunction</li></ul></li></ul></li><li>Accelerator pedal position sensor malfunction (Not operating linearly)</li></ul>



- Turbine sensor or VSS malfunction
- Operation of fail-safe function.
  - Short to power or GND at TCC control solenoid related circuit.

**NOTE:**

- Before following the troubleshooting steps, make sure that the Automatic Transmission On-Board Diagnostic and Automatic Transmission Basic Inspection are conducted. (See **BASIC INSPECTION [SJ6A-EL]**.)

**Diagnostic procedure**

STEP	INSPECTION	ACTION	
1	<ul style="list-style-type: none"> <li>• With the ignition switch at the ON position.</li> <li>• Does the gear position indicator light indication correspond to the selector lever position?</li> </ul>	Yes	Go to the next step.
		No	Go to No.27 "GEAR POSITION INDICATOR LIGHT DOES NOT ILLUMINATE IN M RANGE", or No.28 "GEAR POSITION INDICATOR LIGHT ILLUMINATES IN D RANGE OR P, N, R POSITIONS".
2	<ul style="list-style-type: none"> <li>• Disconnect the TCM.</li> <li>• Is the resistance between the TCM ground terminal 1P, 1X and the body GND <b>less than 5.0 ohms</b>?</li> </ul>	Yes	Go to the next step.
		No	Repair open ground circuit.
3	<ul style="list-style-type: none"> <li>• Access the following PCM PIDs using the M-MDS.               <ul style="list-style-type: none"> <li>▪ RPM</li> <li>▪ APP</li> <li>▪ TP</li> <li>▪ ECT</li> <li>▪ ENG_TRQ</li> </ul> </li> <li>• Are PIDs value normal?</li> </ul>	Yes	Go to the next step.
		No	Inspect and repair suspected PID related part.
4	<ul style="list-style-type: none"> <li>• Inspect the TFT sensor.</li> </ul> <p>(See <b>TRANSMISSION FLUID TEMPERATURE (TFT) SENSOR INSPECTION [SJ6A-EL]</b>.)</p> <ul style="list-style-type: none"> <li>• Is the TFT sensor normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the TFT sensor.

5	<ul style="list-style-type: none"> <li>Inspect the TCC control solenoid.</li> </ul> <p>(See <b>SOLENOID VALVE INSPECTION [SJ6A-EL]</b>.)</p> <ul style="list-style-type: none"> <li>Is the line pressure control solenoid normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the control valve body. (See <b>CONTROL VALVE BODY REMOVAL [SJ6A-EL]</b> .) (See <b>CONTROL VALVE BODY INSTALLATION [SJ6A-EL]</b> .)
6	<ul style="list-style-type: none"> <li>Remove the torque converter.</li> </ul> <p>(See <b>TORQUE CONVERTER REMOVAL/INSTALLATION [SJ6A-EL]</b>.)</p> <ul style="list-style-type: none"> <li>Inspect the torque converter.</li> <li>Is the torque converter normal?</li> </ul>	Yes	Inspect the ATF condition. <ul style="list-style-type: none"> <li>If a large amount of metal specks are found, replace the transmission.</li> </ul> <p>(See <b>AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL]</b>.)</p> <ul style="list-style-type: none"> <li>If a large amount of metal specks are not found, replace the control valve body.</li> </ul> <p>(See <b>CONTROL VALVE BODY REMOVAL [SJ6A-EL]</b>.)</p> <p>(See <b>CONTROL VALVE BODY INSTALLATION [SJ6A-EL]</b>.)</p>
		No	Replace the torque converter.
7	<ul style="list-style-type: none"> <li>Verify test results.               <ul style="list-style-type: none"> <li>If normal, return to the diagnostic index to service any additional symptoms.</li> <li>If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.                   <ul style="list-style-type: none"> <li>If the vehicle is repaired, troubleshooting completed.</li> <li>If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.</li> </ul> </li> </ul> </li> </ul>		

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### NO.13 NO KICKDOWN [SJ6A-EL]

13	No kickdown
DESCRIPTION	<ul style="list-style-type: none"><li>• Does not downshift when accelerator pedal is fully depressed within kickdown range.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• If transmission does not downshift though shifting is normal, the malfunction is in the accelerator pedal position, engine speed, throttle position, engine coolant temperature sensor, engine torque signals or TCM (including sensor GND, sensor wiring harness and connector, CAN communication).</li></ul>

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### NO.14 ENGINE FLARES UP OR SLIPS WHEN UPSHIFTING OR DOWNSHIFTING [SJ6A-EL]

14	Engine flares up or slips when upshifting or downshifting
DESCRIPTION	<ul style="list-style-type: none"><li>• When the accelerator pedal is depressed for acceleration from standstill, engine speed increases but the vehicle speed increases slowly.</li><li>• When the accelerator pedal is depressed while driving, engine speed increases but the vehicle speed does not.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• There is clutch slippage because the clutch is stuck or the line pressure is low.<ul style="list-style-type: none"><li>▪ Clutch stuck, slippage (C1 clutch, C2 clutch, C3 clutch, B1 brake, B2 brake, B3 brake)<ul style="list-style-type: none"><li>• Line pressure low</li><li>• Incorrect throttle position signal</li><li>• Incorrect accelerator pedal position signal</li><li>• Incorrect engine speed signal</li><li>• Incorrect engine coolant temperature signal</li><li>• Incorrect engine torque signal</li><li>• VSS malfunction</li><li>• Turbine sensor malfunction</li><li>• Sensor GND malfunction</li><li>• Shift solenoid A malfunction</li><li>• Shift solenoid B malfunction</li><li>• Shift solenoid C malfunction</li><li>• Shift solenoid D malfunction</li><li>• Shift solenoid E malfunction</li><li>• Line pressure control solenoid malfunction</li><li>• TCC control solenoid malfunction</li></ul></li></ul></li></ul>

- Shift solenoid F malfunction
- Shift solenoid G malfunction
- Body GND malfunction
- Control valve body malfunction

**NOTE:**

- Before following the troubleshooting steps, make sure that the Automatic Transmission On-Board Diagnostic and Automatic Transmission Basic Inspection are conducted. (See **BASIC INSPECTION [SJ6A-EL]**.)

**Diagnostic procedure**

STEP	INSPECTION	ACTION	
1	<ul style="list-style-type: none"> <li>• Is the line pressure normal?</li> </ul> <p>(See <b>MECHANICAL SYSTEM TEST [SJ6A-EL]</b>.)</p>	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts according to the inspection results.
2	<ul style="list-style-type: none"> <li>• Is shift point normal?</li> </ul> <p>(See <b>ROAD TEST [SJ6A-EL]</b>.)</p>	Yes	Go to the next step.
		No	Go to No.9 "ABNORMAL SHIFTING".
3	<ul style="list-style-type: none"> <li>• Access the following PCM PIDs using the M-MDS. <ul style="list-style-type: none"> <li>▪ RPM</li> <li>▪ APP</li> <li>▪ TP</li> <li>▪ ECT</li> <li>▪ ENG_TRQ</li> </ul> </li> <li>• Are PIDs value normal?</li> </ul>	Yes	Go to the next step.
		No	Inspect and repair suspected PID related part.
4	<ul style="list-style-type: none"> <li>• Stop the engine.</li> <li>• Inspect following solenoids.</li> </ul> <p>(See <b>SOLENOID VALVE INSPECTION [SJ6A-EL]</b>.)</p> <ul style="list-style-type: none"> <li>▪ Shift solenoid A</li> <li>▪ Shift</li> </ul>	Yes	<p>Inspect the ATF condition.</p> <ul style="list-style-type: none"> <li>• If a large amount of metal specks are found, replace the transmission.</li> </ul> <p>(See <b>AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL]</b>.)</p> <ul style="list-style-type: none"> <li>• If a large amount of metal specks are not found, replace the control valve body.</li> </ul> <p>(See <b>CONTROL VALVE BODY REMOVAL</b></p>

	<ul style="list-style-type: none"> <li>▪ solenoid B</li> <li>▪ Shift solenoid C</li> <li>▪ Shift solenoid D</li> <li>▪ Shift solenoid E</li> <li>▪ Line pressure control solenoid</li> <li>▪ TCC control solenoid</li> <li>▪ Shift solenoid F</li> <li>▪ Shift solenoid G</li> </ul> <ul style="list-style-type: none"> <li>• Are they normal?</li> </ul>		<p><b>[SJ6A-EL].)</b></p> <p>(See <b>CONTROL VALVE BODY INSTALLATION [SJ6A-EL].)</b></p>
		No	<p>Replace the control valve body.</p> <p>(See <b>CONTROL VALVE BODY REMOVAL [SJ6A-EL].)</b></p> <p>(See <b>CONTROL VALVE BODY INSTALLATION [SJ6A-EL].)</b></p>
5	<ul style="list-style-type: none"> <li>• Inspect the coupler component for open or short.</li> <li>• Are coupler component normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the coupler component.
6	<ul style="list-style-type: none"> <li>• Inspect the ATF condition.</li> <li>• Are a large amount of specks found?</li> </ul>	Yes	<p>Replace the transmission.</p> <p>(See <b>AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL].)</b></p>
		No	<p>Replace the control valve body.</p> <p>(See <b>CONTROL VALVE BODY REMOVAL [SJ6A-EL].)</b></p> <p>(See <b>CONTROL VALVE BODY INSTALLATION [SJ6A-EL].)</b></p>
7	<ul style="list-style-type: none"> <li>• Verify test results.</li> <li>▪ If normal, return to the diagnostic index to service any additional symptoms.</li> <li>▪ If malfunction remains, inspect the related Service Bulletins and/or</li> </ul>		

On-line Repair Information and perform repair or diagnosis.

- If the vehicle is repaired, troubleshooting completed.
- If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.

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NO.15 ENGINE FLARES UP OR SLIPS WHEN ACCELERATING VEHICLE [SJ6A-EL]

15	Engine flares up or slips when accelerating the vehicle
DESCRIPTION	<ul style="list-style-type: none"><li>• Engine flares up when the accelerator pedal is depressed for upshifting.</li><li>• Engine flares up suddenly when the accelerator pedal is depressed for downshifting.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• The malfunction is basically the same as for No.14 “ENGINE FLARES UP OR SLIPS WHEN UPSHIFTING OR DOWNSHIFTING”.<ul style="list-style-type: none"><li>▪ If conditions for No.14 worsen, the malfunction will develop to No.15.</li></ul></li></ul>



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### NO.16 Judder upon torque converter clutch (TCC) operation [SJ6A-EL]

16	Judder upon torque converter clutch (TCC) operation
DESCRIPTION	<ul style="list-style-type: none"><li>• Vehicle jolts when TCC is engaged.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Poor TCC engagement due to either slippage because the TCC piston is stuck or the line pressure is low. <b>CAUTION:</b><ul style="list-style-type: none"><li>• If the TCC is stuck, inspect it. In addition, inspect the oil cooler for foreign particles which may have mixed in with the ATF.</li></ul></li><li>▪ TCC slippage, burnt<ul style="list-style-type: none"><li>• Line pressure low</li><li>• Incorrect throttle position signal</li><li>• Incorrect accelerator pedal position signal</li><li>• Incorrect engine speed signal</li><li>• Incorrect engine coolant temperature signal</li><li>• Incorrect engine torque signal</li><li>• VSS malfunction</li><li>• Turbine sensor malfunction</li><li>• Sensor GND malfunction</li><li>• TCC control solenoid malfunction</li><li>• Control valve body malfunction</li></ul></li><li>▪ Torque converter malfunction</li></ul>

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### NO.17 EXCESSIVE SHIFT SHOCK FROM N TO D OR N TO R POSITION/RANGE [SJ6A-EL]

17	Excessive shift shock from N to D or N to R position/range
DESCRIPTION	<ul style="list-style-type: none"> <li>• Strong shock felt when shifting from N to D or N to R position/range at idle.</li> </ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>• Shift shock may worsen when the fail-safe is operating. If no DTC is output, the shift shock may worsen due to poor operation of the control valve body or sticking of the clutch. <ul style="list-style-type: none"> <li>▪ Clutch burnt (N→D: C1 clutch, N→R: C3 clutch or B4 brake) <ul style="list-style-type: none"> <li>• ATF level low</li> <li>• Line pressure low</li> <li>• Incorrect throttle position signal</li> <li>• Incorrect accelerator pedal position signal</li> <li>• Incorrect engine speed signal</li> <li>• Incorrect engine coolant temperature signal</li> <li>• Incorrect engine torque signal</li> <li>• Incorrect turbine sensor signal (N→D)</li> <li>• TFT sensor malfunction</li> <li>• Sensor GND malfunction</li> <li>• Shift solenoid A malfunction</li> <li>• Shift solenoid F malfunction</li> <li>• Line pressure control solenoid malfunction</li> <li>• TCC control solenoid malfunction (N→R)</li> <li>• Control valve body malfunction</li> </ul> </li> </ul> </li> <li>▪ Poor hydraulic operation (Malfunction in range change)</li> <li>▪ Idle speed high</li> </ul>

- Poor tightening torque of engine mount, exhaust mount, suspension, propeller shaft
- Line pressure high
- Insufficient battery voltage
- Harness or connector malfunction
- AT malfunction

**NOTE:**

- Before following the troubleshooting steps, make sure that the Automatic Transmission On-Board Diagnostic and Automatic Transmission Basic Inspection are conducted. (See **BASIC INSPECTION [SJ6A-EL]**.)

**Diagnostic procedure**

STEP	INSPECTION	ACTION	
1	<ul style="list-style-type: none"> <li>• Does the shift shock occur only when the engine is cold?</li> </ul>	Yes	Go to the next step.
		No	Go to Step 3.
2	<ul style="list-style-type: none"> <li>• Inspect the TFT sensor and related wiring harness: vibration, intermittent open/short circuit.</li> </ul> <p>(See <b>TRANSMISSION FLUID TEMPERATURE (TFT) SENSOR INSPECTION [SJ6A-EL]</b>.)</p> <ul style="list-style-type: none"> <li>• Is it normal?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace part if necessary.
3	<ul style="list-style-type: none"> <li>• Perform the initial learning procedure.</li> </ul> <p>(See <b>Initial Learning</b>.)</p> <ul style="list-style-type: none"> <li>• Does symptom eliminate?</li> </ul>	Yes	Troubleshooting is completed.
		No	Go to the next step.
4	<ul style="list-style-type: none"> <li>• Is the line pressure normal?</li> </ul> <p>(See <b>MECHANICAL SYSTEM TEST[SJ6A-EL]</b>.)</p>	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts according to the inspection results.
5	<ul style="list-style-type: none"> <li>• Is stall speed normal?</li> </ul> <p>(See <b>MECHANICAL SYSTEM TEST[SJ6A-EL]</b>.)</p>	Yes	Go to the next step.
		No	Repair or replace any malfunctioning parts according to the inspection results.

6	<ul style="list-style-type: none"> <li>Access the following PCM PIDs using the M-MDS. <ul style="list-style-type: none"> <li>RPM</li> <li>APP</li> <li>TP</li> <li>ECT</li> <li>ENG_TRQ</li> </ul> </li> <li>Are PIDs value normal?</li> </ul>	Yes	Go to the next step.
7	<ul style="list-style-type: none"> <li>Stop the engine.</li> <li>Inspect following solenoids. (See <b>SOLENOID VALVE INSPECTION [SJ6A-EL].</b>) <ul style="list-style-type: none"> <li>Line pressure control solenoid</li> <li>Shift solenoid A</li> <li>Shift solenoid F</li> <li>TCC control solenoid</li> </ul> </li> <li>Are they normal?</li> </ul>	Yes	Inspect the ATF condition. <ul style="list-style-type: none"> <li>If a large amount of metal specks are found, replace the transmission.  (See <b>AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL].</b>)</li> <li>If a large amount of metal specks are not found, replace the control valve body.  (See <b>CONTROL VALVE BODY REMOVAL [SJ6A-EL].</b>)  (See <b>CONTROL VALVE BODY INSTALLATION [SJ6A-EL].</b>)</li> </ul>
		No	<ul style="list-style-type: none"> <li>Replace the control valve body.  (See <b>CONTROL VALVE BODY REMOVAL [SJ6A-EL].</b>)  (See <b>CONTROL VALVE BODY INSTALLATION [SJ6A-EL].</b>)</li> </ul>
8	<ul style="list-style-type: none"> <li>Verify test results. <ul style="list-style-type: none"> <li>If normal, return to the diagnostic index to service any additional symptoms.</li> <li>If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. <ul style="list-style-type: none"> <li>If the vehicle is repaired, troubleshooting completed.</li> <li>If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.</li> </ul> </li> </ul> </li> </ul>		

## Initial Learning

### WARNING:

- When performing a initial learning, be aware of other vehicles, people, and other impediments to order to avoid an accident.

### NOTE:

- While self-learning control gradually reduces shock during normal driving, initial learning is performed to initially learn a certain amount of driving conditions.

#### 1. Warm-up

- Increase the ATF temperature by leaving the vehicle idling or performing city driving. Verify that the ATF temperature is **between 50—120 °C { 122—248 °F}**. If the ATF temperature is outside this range, work to bring it inside the range.

### CAUTION:

- Do not raise the ATF temperature by stalling the engine.

### NOTE:

- If the ATF temperature is not **between 50—120 °C { 122—248 °F}**, initial learning cannot be performed.

Before learning, inspect for variable shift shock.

#### 2. Gear shift control learning

- In D range, with the throttle opening between **25—30 %**, drive until you reach 6th gear and a vehicle speed of **80 km/h { 50 mph}** or higher. Then, release the accelerator pedal and coast, and bring the vehicle to a stop in at least **60 s**. Repeat this procedure **10 times**.

#### 3. Inspect learning results

- Verify that variable speed shock and shift shock have decreased compared to the conditions before learning.

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### NO.18 EXCESSIVE SHIFT SHOCK IS GIVEN WHEN UPSHIFTING AND DOWNSHIFTING [SJ6A-EL]

18	<b>Excessive shift shock is given when upshifting and downshifting</b>
<b>DESCRIPTION</b>	<ul style="list-style-type: none"> <li>Excessive shift shock is felt when depressing the accelerator pedal at upshifting.</li> <li>During cruising, excessive shift shock is felt when depressing accelerator pedal at downshifting.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Shift shock may worsen when the fail-safe is operating. The shift shock may worsen if the accelerator pedal position sensor, TP sensor, or turbine sensor malfunctions. <ul style="list-style-type: none"> <li>Clutch slippage, burnt (C1 clutch, C2 clutch, C3 clutch, B1 brake, B2 brake, B3 brake, B4 brake) <ul style="list-style-type: none"> <li>ATF level low</li> <li>Line pressure low, high</li> <li>Incorrect throttle position signal</li> <li>Turbine sensor malfunction</li> <li>Shift solenoid A malfunction</li> <li>Shift solenoid B malfunction</li> <li>Shift solenoid C malfunction</li> <li>Shift solenoid D malfunction</li> <li>Shift solenoid E malfunction</li> <li>Line pressure control solenoid malfunction</li> <li>TCC control solenoid malfunction</li> <li>Shift solenoid F malfunction</li> <li>Shift solenoid G malfunction</li> <li>Body GND and sensor GND malfunction</li> <li>Control valve body malfunction</li> <li>TCM malfunction</li> </ul> </li> </ul> </li> </ul>

- |  |  |
|--|--|
|  | <ul style="list-style-type: none"><li>• AT internal malfunction</li><li>• TR switch malfunction</li><li>• Harness and/or connector malfunction</li><li>• Insufficient battery voltage</li><li>• Loose parts installation (engine or transmission mounts, suspension, propeller shaft)</li></ul> <ul style="list-style-type: none"><li>▪ Poor hydraulic operation (Malfunction in range change)</li></ul> |
|--|--|

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NO.19 EXCESSIVE SHIFT SHOCK ON TORQUE CONVERTER CLUTCH (TCC) [SJ6A-EL]

19	Excessive shift shock on torque converter clutch (TCC)
DESCRIPTION	<ul style="list-style-type: none"><li>• Strong shock is felt when the TCC is engaged.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• The troubleshooting flow is the same as No.16 "JUDDER UPON TORQUE CONVERTER CLUTCH (TCC) OPERATION".</li></ul>



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### NO.20 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN ALL POSITIONS/RANGES [SJ6A-EL]

20	Noise occurs at idle when vehicle is stopped in all positions/ranges
DESCRIPTION	<ul style="list-style-type: none"> <li>Transmission is noisy in all positions and ranges when the vehicle is idling.</li> </ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>The malfunction is in the pressure solenoid or oil pump which causes a high-pitched noise to be emitted from the transmission at idle.</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>If a noise is emitted during shifting only, the malfunction is in the C1 clutch, C2 clutch, C3 clutch, B1 brake, B2 brake, B3 brake, or B4 brake.</li> <li>If a noise is emitted during shifting at certain gears only or during deceleration only, it is gear noise.</li> <li>Before following the troubleshooting steps, make sure that the Automatic Transmission On-Board Diagnostic and Automatic Transmission Basic Inspection are conducted. (See <b>BASIC INSPECTION [SJ6A-EL]</b>.)</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>Inspect engine condition.</li> <li>Is there any engine concern (e.g. Rough idle, vibration)?</li> </ul>	Yes Go to appropriate symptom troubleshooting. (See <b>SYMPTOM DIAGNOSTIC INDEX [LF]</b> .)
		No Replace basic inspection and repair or replace any malfunctioning parts according to the inspection result
2	<ul style="list-style-type: none"> <li>Verify test results. <ul style="list-style-type: none"> <li>If normal, return to the diagnostic index to service any additional symptoms.</li> <li>If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.</li> </ul> </li> </ul>	

If the vehicle is repaired, troubleshooting completed.

- If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.

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### NO.21 NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN D RANGE, OR IN R POSITION [SJ6A-EL]

<b>21</b>	<b>Noise occurs at idle when vehicle is stopped in D range, or in R position</b>
<b>DESCRIPTION</b>	<ul style="list-style-type: none"><li>• Transmission is noisy in driving ranges when vehicle idling.</li></ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"><li>• Although the malfunction is basically the same as No.20 "NOISE OCCURS AT IDLE WHEN VEHICLE IS STOPPED IN ALL POSITIONS/RANGES", other causes may include selector lever position disparity or TR switch position disparity.</li></ul>

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### NO.24 ENGINE STALLS WHEN SHIFTED TO D RANGE, OR IN R POSITION [SJ6A-EL]

24	Engine stalls when shifted to D range, or in R position
DESCRIPTION	<ul style="list-style-type: none"> <li>Engine stalls when shifting from N or P position to D range or R position at idle.</li> </ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>The malfunction is on the engine control side (e.g. electronic controlled throttle system). Otherwise, the malfunction is in the turbine sensor (engine sometimes starts) or the TCC circuit (engine always stalls).</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>Before following the troubleshooting steps, make sure that the Automatic Transmission On-Board Diagnostic and Automatic Transmission Basic Inspection are conducted. (See <b>BASIC INSPECTION [SJ6A-EL]</b>.)</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>Go to symptom troubleshooting No.5 "ENGINE STALLS-AFTER START/AT IDLE".</li> <li>(See <b>NO.5 ENGINE STALLS-AFTER START/AT IDLE [LF]</b>.)</li> <li>Is the engine control system normal?</li> </ul>	Yes Go to the next step.
		No Repair or replace any malfunctioning parts according to the inspection results.
2	<ul style="list-style-type: none"> <li>Remove the torque converter.</li> <li>(See <b>TORQUE CONVERTER REMOVAL/INSTALLATION [SJ6A-EL]</b>.)</li> <li>Inspect the torque converter.</li> <li>Is the torque converter normal?</li> </ul>	<p>Yes Inspect for bending, damage, corrosion or kinks of the oil cooler pipes.</p> <ul style="list-style-type: none"> <li>If normal, replace the control valve body.</li> </ul> <p>(See <b>CONTROL VALVE BODY REMOVAL [SJ6A-EL]</b>.)</p> <p>(See <b>CONTROL VALVE BODY INSTALLATION [SJ6A-EL]</b>.)</p>

			<ul style="list-style-type: none"><li>• If problem remains, replace the transmission.</li></ul> <p>(See <b>AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL]</b>.)</p>
		No	Replace the torque converter.
3	<ul style="list-style-type: none"><li>• Verify test results.<ul style="list-style-type: none"><li>▪ If normal, return to the diagnostic index to service any additional symptoms.</li><li>▪ If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.<ul style="list-style-type: none"><li>• If the vehicle is repaired, troubleshooting completed.</li><li>• If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.</li></ul></li></ul></li></ul>		

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### NO.25 ENGINE STALLS WHEN DRIVING AT SLOW SPEED OR STOPPING [SJ6A-EL]

25	Engine stalls when driving at slow speeds or stopping
DESCRIPTION	<ul style="list-style-type: none"> <li>Engine stalls when the brake pedal is depressed while driving at low speed or stopping.</li> </ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>The malfunction is in the engine control system (e.g. Fuel injection control, electronic controlled throttle system). Otherwise the TCC circuit.</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>Before following the troubleshooting steps, make sure that the Automatic Transmission On-Board Diagnostic and Automatic Transmission Basic Inspection are conducted. (See <b>BASIC INSPECTION [SJ6A-EL]</b>.)</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>Go to symptom troubleshooting No.10 "LOW IDLE/STALLS DURING DECELERATION". (See <b>NO.10 LOW IDLE/STALLS DURING DECELERATION [LF]</b>.)</li> <li>Is the engine control system normal?</li> </ul>	Yes Go to No.24 "ENGINE STALLS WHEN SHIFTED TO D RANGE, OR IN R POSITION".
		No Repair or replace any malfunctioning parts according to the inspection results.
2	<ul style="list-style-type: none"> <li>Verify test results. <ul style="list-style-type: none"> <li>If normal, return to the diagnostic index to service any additional symptoms.</li> <li>If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. <ul style="list-style-type: none"> <li>If the vehicle is repaired, troubleshooting completed.</li> <li>If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.</li> </ul> </li> </ul> </li> </ul>	

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### NO.26 STARTER DOES NOT WORK [SJ6A-EL]

<b>26</b>	<b>Starter does not work</b>
<b>DESCRIPTION</b>	<ul style="list-style-type: none"> <li>Starter does not work even when in P or N position.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Selector lever mis-adjustment</li> <li>Manual shaft malfunction</li> <li>TR switch malfunction</li> <li>TR switch mis-adjustment</li> <li>Transmission operates in fail-safe function (Starter lock system related circuit open or short)</li> <li>Immobilizer system operating or system malfunction.</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>Inspect selector lever, TR switch and manual shaft positions.</li> <li>Are these position normal?</li> </ul>	Yes Go to the next step.
		No Adjust the suspect part position.
2	<ul style="list-style-type: none"> <li>Inspect the TR switch. (See <b>TRANSMISSION RANGE (TR) SWITCH INSPECTION [SJ6A-EL]</b>.)</li> <li>Is the TR switch normal?</li> </ul>	Yes Go to engine system troubleshooting No.3 "WILL NOT CRANK" troubleshooting procedure.
		No Replace the TR switch.  (See <b>TRANSMISSION RANGE (TR) SWITCH REMOVAL/INSTALLATION [SJ6A-EL]</b> )
3	<ul style="list-style-type: none"> <li>Verify test results. <ul style="list-style-type: none"> <li>If normal, return to the diagnostic index to service any additional symptoms.</li> <li>If malfunction remains, inspect the related Service Bulletins and/or</li> </ul> </li> </ul>	



On-line Repair Information and perform repair or diagnosis.

- If the vehicle is repaired, troubleshooting completed.
- If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.

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### NO.29 DOES NOT UPSHIFT IN M RANGE [SJ6A-EL]

<b>29</b>	<b>Does not upshift in M range</b>
<b>DESCRIPTION</b>	<ul style="list-style-type: none"> <li>Gear position indicator light in instrument cluster illuminates, but the vehicle does not upshift when the selector lever is pushed to "+" side or steering shift switch "UP" is pulled.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Up switch or related wiring harness malfunction</li> <li>Steering shift switch or related circuit malfunction.</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION		ACTION
1	Inspect the voltage at the TCM terminal 2J.  (See <b>TCM INSPECTION [SJ6A-EL].</b> )  Is the voltage normal?	Yes	Inspect the instrument cluster.
		No	Inspect the up switch. <ul style="list-style-type: none"> <li>If the up switch is normal, inspect for continuity between the up switch and TCM terminal 2J.</li> </ul> Inspect steering shift switch. <ul style="list-style-type: none"> <li>If the steering shift switch is normal, inspect for continuity between the steering shift switch and TCM terminal 2AF.</li> </ul>
2	<ul style="list-style-type: none"> <li>Verify test results.               <ul style="list-style-type: none"> <li>If normal, return to the diagnostic index to service any additional symptoms.</li> <li>If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.                   <ul style="list-style-type: none"> <li>If the vehicle is repaired, troubleshooting completed.</li> <li>If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.</li> </ul> </li> </ul> </li> </ul>		

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### NO.30 DOES NOT DOWNSHIFT IN M RANGE [SJ6A-EL]

<b>30</b>	<b>Does not downshift in M range</b>
<b>DESCRIPTION</b>	<ul style="list-style-type: none"> <li>• Gear position indicator light in instrument cluster illuminates, but the vehicle does not downshift when the selector lever is pushed to “–” side or steering shift switch “DOWN” is pushed.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Down switch or related wiring harness malfunction</li> <li>• Steering shift switch or related circuit malfunction.</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION		ACTION
1	Inspect the voltage at the TCM terminal 2F.  (See <b>TCM INSPECTION [SJ6A-EL].</b> )  Is the voltage normal?	Yes	Inspect the instrument cluster.
		No	Inspect the down switch. <ul style="list-style-type: none"> <li>• If the down switch is normal, inspect for continuity between the down switch and TCM terminal 2F.</li> </ul> Inspect steering shift switch. <ul style="list-style-type: none"> <li>• If the steering shift switch is normal, inspect for continuity between the steering shift switch and TCM terminal 2AF.</li> </ul>
2	<ul style="list-style-type: none"> <li>• Verify test results.               <ul style="list-style-type: none"> <li>▪ If normal, return to the diagnostic index to service any additional symptoms.</li> <li>▪ If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.                   <ul style="list-style-type: none"> <li>• If the vehicle is repaired, troubleshooting completed.</li> <li>• If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.</li> </ul> </li> </ul> </li> </ul>		

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## 2008 - MX-5 - Transmission/Transaxle

### NO.27 GEAR POSITION INDICATOR LIGHT DOES NOT ILLUMINATE IN D OR M RANGE [SJ6A-EL]

<b>27</b>	<b>Gear position indicator light does not illuminate in D or M range</b>
<b>DESCRIPTION</b>	<ul style="list-style-type: none"> <li>Gear position indicator light in instrument cluster does not illuminate in D or M range with the ignition switch at ON.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>M range switch, TR switch, instrument cluster, or related wiring harness malfunction</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>Before following the troubleshooting steps, make sure that the Automatic Transmission ON-Board Diagnostic and Automatic Transmission Basic Inspection are conducted. (See <b>BASIC INSPECTION[SJ6A-EL]</b>.)</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION	ACTION
1	With the ignition switch at ON,  When selector lever is moved, does selector illumination indicate synchronized position to lever location?	Yes Go to the next step.
		No Inspect the TR switch.  (See <b>TRANSMISSION RANGE (TR) SWITCH INSPECTION[SJ6A-EL]</b> .)
2	Inspect the voltage at TCM terminal 2G (M range switch).  (See <b>TCM INSPECTION[SJ6A-EL]</b> .)  Is voltage normal?	Yes Go to the next step.
		No Repair or replace any defective part.
3	Inspect the instrument cluster.  (See <b>INSTRUMENT CLUSTER INSPECTION.</b> )  Is instrument cluster normal?	Yes Go to the next step.
		No Repair or replace any defective part.
	Disconnect the TCM and instrument cluster connector.	Yes Repair or replace harness for short to GND, then go to the next step.

4	<ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Check continuity between the following circuits: <ul style="list-style-type: none"> <li>▪ TCM terminal 1C and body GND</li> <li>▪ TCM terminal 1G and body GND</li> <li>▪ Instrument cluster terminal 1I and body GND</li> <li>▪ Instrument cluster terminal 1J and body GND</li> </ul> </li> <li>• Is there continuity?</li> </ul>	No	Go to the next step.
5	<p>Disconnect the TCM and instrument cluster connector.</p> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Check continuity between the following circuits: <ul style="list-style-type: none"> <li>▪ TCM terminal 1C and instrument cluster terminal 1I</li> <li>▪ TCM terminal 1G and instrument cluster terminal 1J</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace harness for open circuit, then go to the next step.
6	<ul style="list-style-type: none"> <li>• Verify the test results. <ul style="list-style-type: none"> <li>▪ If normal, return to the diagnostic index to service any additional symptoms.</li> <li>▪ If the malfunction remains, inspect the related Service Bulletins and/or On-line Repair information and perform repair or diagnosis. <ul style="list-style-type: none"> <li>• If the vehicle is repaired, troubleshooting is completed.</li> <li>• If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.</li> </ul> </li> </ul> </li> </ul>		

## 2008 - MX-5 - Transmission/Transaxle

### NO.28 GEAR POSITION INDICATOR LIGHT ILLUMINATE IN P, R AND N POSITION [SJ6A-EL]

28	Gear position indicator light illuminate in P, R and N position
DESCRIPTION	<ul style="list-style-type: none"> <li>Gear position indicator light in instrument cluster illuminates in P, R and N position with the ignition switch at ON.</li> </ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>M range switch, TR switch, instrument cluster, or related wiring harness malfunction</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>Before following the troubleshooting steps, make sure that the Automatic Transaxle ON-Board Diagnostic and Automatic Transaxle Basic Inspection are conducted. (See <a href="#">BASIC INSPECTION[SJ6A-EL]</a>.)</li> </ul>

#### Diagnostic procedure

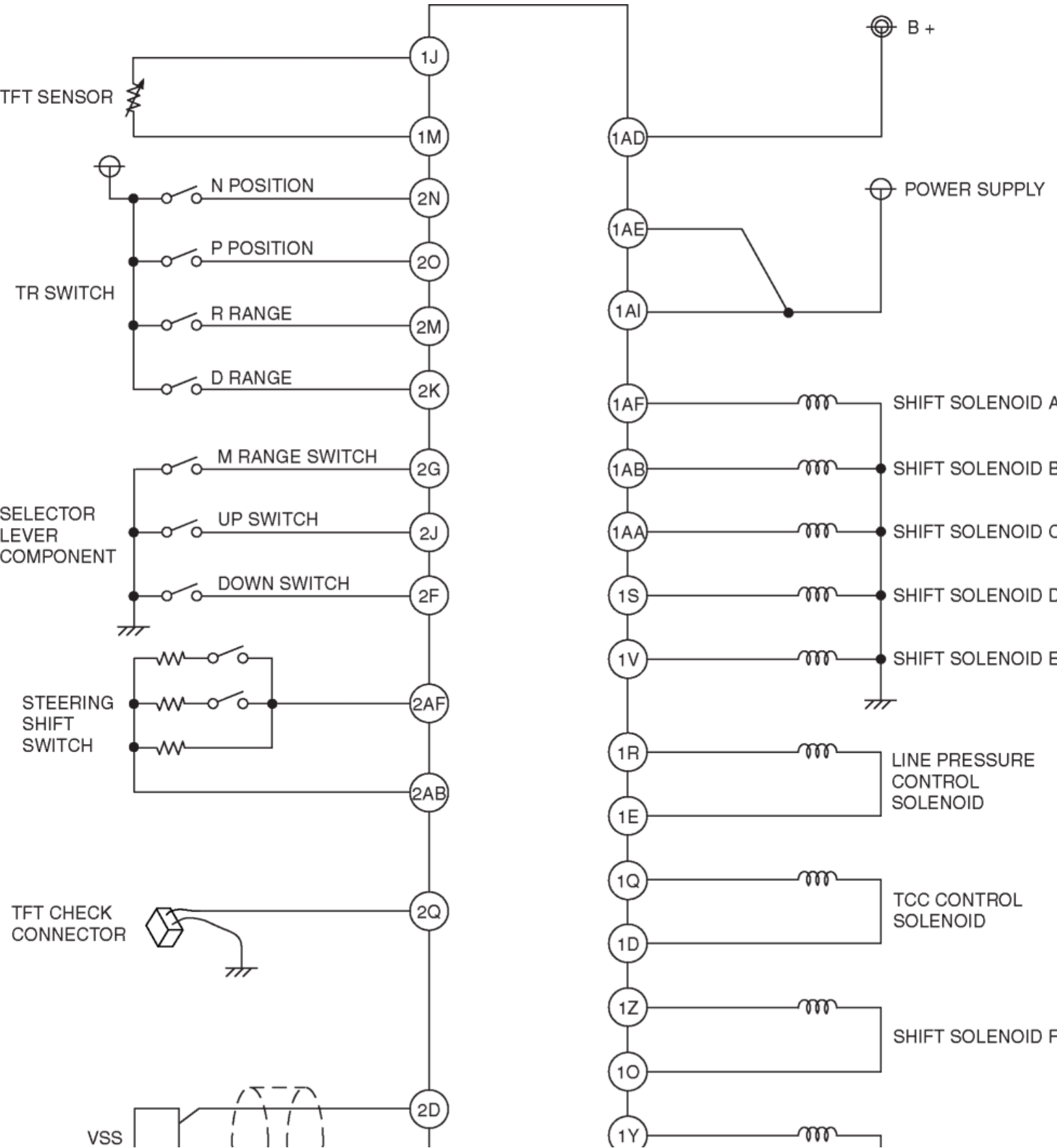
STEP	INSPECTION	ACTION
1	With the ignition switch at ON,  When selector lever is moved, does selector illumination indicate synchronized position to lever location?	Yes Go to the next step.
		No Inspect the TR switch.  (See <a href="#">TRANSMISSION RANGE (TR) SWITCH INSPECTION[SJ6A-EL]</a> .)
2	Inspect the voltage at TCM terminal 2G (M range switch).  (See <a href="#">TCM INSPECTION[SJ6A-EL]</a> .)  Is voltage normal?	Yes Go to the next step.
		No Repair or replace any defective part.
3	Inspect the instrument cluster.  (See <a href="#">INSTRUMENT CLUSTER INSPECTION</a> .)  Is instrument cluster normal?	Yes Go to the next step.
		No Repair or replace any defective part.
	Disconnect the TCM and instrument cluster connector.	Yes Repair or replace harness for short to GND, then go to the next step.

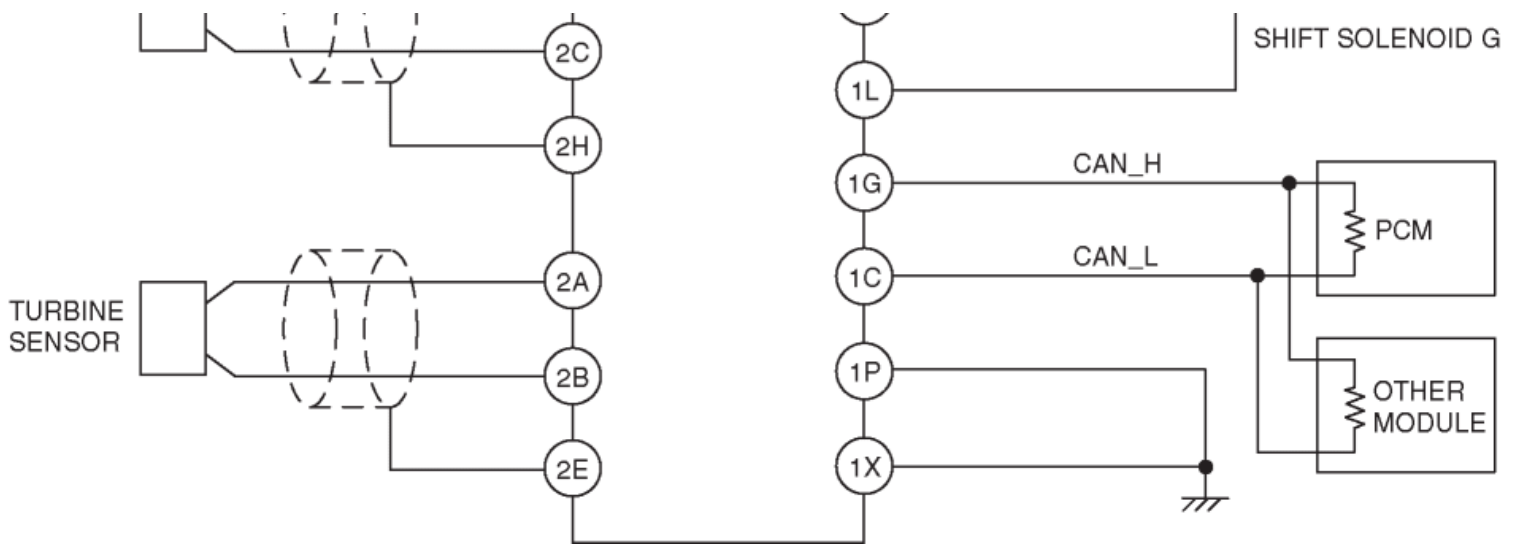


4	<ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Check continuity between the following circuits: <ul style="list-style-type: none"> <li>▪ TCM terminal 1C and body GND</li> <li>▪ TCM terminal 1G and body GND</li> <li>▪ Instrument cluster terminal 1I and body GND</li> <li>▪ Instrument cluster terminal 1J and body GND</li> </ul> </li> <li>• Is there continuity?</li> </ul>	No	Go to the next step.
5	<p>Disconnect the TCM and instrument cluster connector.</p> <ul style="list-style-type: none"> <li>• Turn the ignition switch off.</li> <li>• Check continuity between the following circuits: <ul style="list-style-type: none"> <li>▪ TCM terminal 1C and instrument cluster terminal 1I</li> <li>▪ TCM terminal 1G and instrument cluster terminal 1J</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace harness for open circuit, then go to the next step.
6	<ul style="list-style-type: none"> <li>• Verify the test results. <ul style="list-style-type: none"> <li>▪ If normal, return to the diagnostic index to service any additional symptoms.</li> <li>▪ If the malfunction remains, inspect the related Service Bulletins and/or On-line Repair information and perform repair or diagnosis. <ul style="list-style-type: none"> <li>• If the vehicle is repaired, troubleshooting is completed.</li> <li>• If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.</li> </ul> </li> </ul> </li> </ul>		

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AUTOMATIC TRANSMISSION CONTROL SYSTEM WIRING DIAGRAM [SJ6A-EL]





## 2008 - MX-5 - Transmission/Transaxle

### NO.22 NO ENGINE BRAKING [SJ6A-EL]

22	No engine braking
DESCRIPTION	<ul style="list-style-type: none"> <li>Engine speed drops to idle but the vehicle coasts when the accelerator pedal is released during cruising at medium to high speeds.</li> <li>Engine speed drops to idle but the vehicle coasts when accelerator pedal is released when in M range (1GR) at low vehicle speed.</li> </ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>Clutch slippage, burnt (C4 clutch/B1 brake/B2 brake/B4 brake) <ul style="list-style-type: none"> <li>Line pressure low <ul style="list-style-type: none"> <li>VSS malfunction</li> <li>Improper signal from PCM (engine speed, accelerator pedal position, throttle position, engine coolant temperature, engine torque signals)</li> <li>Line pressure control solenoid malfunction</li> <li>Control valve body malfunction</li> </ul> </li> </ul> </li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>Before following the troubleshooting steps, make sure that the Automatic Transmission On-Board Diagnostic and Automatic Transmission Basic Inspection are conducted. (See <b>BASIC INSPECTION [SJ6A-EL]</b>.)</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>Do the following symptoms occur concurrently? <ul style="list-style-type: none"> <li>Engine flares up or slips during acceleration</li> <li>Engine</li> </ul> </li> </ul>	<p>Yes Go to No.14 "ENGINE FLARES UP OR SLIPS WHEN UPSHIFTING OR DOWNSHIFTING", or No.15 "ENGINE FLARES UP OR SLIPS WHEN ACCELERATING VEHICLE".</p> <p>No Go to the next step.</p>

	flares up or slips when shifting		
2	<ul style="list-style-type: none"> <li>Access the following PCM PIDs using the M-MDS. <ul style="list-style-type: none"> <li>RPM</li> <li>APP</li> <li>TP</li> <li>ECT</li> <li>ENG_TRQ</li> </ul> </li> <li>Are PIDs value normal?</li> </ul>	Yes	Go to the next step.
		No	Inspect and repair suspected PID related part.
3	<ul style="list-style-type: none"> <li>Stop the engine.</li> <li>Inspect line pressure control solenoid. (See <b>SOLENOID VALVE INSPECTION [SJ6A-EL].</b>)</li> <li>Is the normal?</li> </ul>	Yes	Inspect the ATF condition. <ul style="list-style-type: none"> <li>If a large amount of metal specks are found, replace the transmission. (See <b>AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL].</b>)</li> <li>If a large amount of metal specks are not found, replace the control valve body. (See <b>CONTROL VALVE BODY REMOVAL [SJ6A-EL].</b>) (See <b>CONTROL VALVE BODY INSTALLATION [SJ6A-EL].</b>)</li> </ul>
		No	Replace the control valve body. (See <b>CONTROL VALVE BODY REMOVAL [SJ6A-EL].</b> ) (See <b>CONTROL VALVE BODY INSTALLATION [SJ6A-EL].</b> )
4	<ul style="list-style-type: none"> <li>Verify test results. <ul style="list-style-type: none"> <li>If normal, return to the diagnostic index to service any additional symptoms.</li> <li>If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. <ul style="list-style-type: none"> <li>If the vehicle is repaired, troubleshooting completed.</li> <li>If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.</li> </ul> </li> </ul> </li> </ul>		

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## 2008 - MX-5 - Transmission/Transaxle

### NO.23 TRANSMISSION OVERHEATS [SJ6A-EL]

23	Transmission overheats
DESCRIPTION	<ul style="list-style-type: none"> <li>Burnt smell emitted from transmission.</li> <li>Smoke emitted from transmission.</li> </ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>The malfunction is restricted to the hindrance of coolant at the oil cooler. In addition, overheating of the transmission may be caused by a malfunction of the TFT sensor. <ul style="list-style-type: none"> <li>Line pressure low <ul style="list-style-type: none"> <li>ATF level low</li> <li>Incorrect throttle position signal</li> </ul> </li> <li>Oil cooler malfunction (Foreign material mixed in with ATF)</li> <li>TFT sensor malfunction</li> <li>Excessive amount of ATF</li> </ul> </li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>Before following the troubleshooting steps, make sure that the Automatic Transmission On-Board Diagnostic and Automatic Transmission Basic Inspection are conducted. (See <a href="#">BASIC INSPECTION [SJ6A-EL]</a>.)</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<ul style="list-style-type: none"> <li>Is the line pressure normal?</li> </ul> (See <a href="#">MECHANICAL SYSTEM TEST[SJ6A-EL]</a> .)	YesGo to the next step.
		No Repair or replace any malfunctioning parts according to the inspection results.
2	<ul style="list-style-type: none"> <li>Is stall speed normal?</li> </ul> (See <a href="#">MECHANICAL SYSTEM TEST[SJ6A-</a>	YesGo to the next step.

	<a href="#">ELJ</a> .)	No	Repair or replace any malfunctioning parts according to the inspection results.
3	<ul style="list-style-type: none"><li>Inspect the TFT sensor and related wiring harness: vibration, intermittent open/short circuit</li></ul> <p>(See <a href="#">TRANSMISSION FLUID TEMPERATURE (TFT) SENSOR INSPECTION [SJ6A-EL]</a>.)</p> <ul style="list-style-type: none"><li>Is it normal?</li></ul>	Yes	Go to the next step.
		No	Repair or replace part if necessary.
4	<ul style="list-style-type: none"><li>Inspect the line pressure control solenoid.</li></ul> <p>(See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>.)</p> <ul style="list-style-type: none"><li>Is it normal?</li></ul>	Yes	Go to the next step.
		No	Replace the control valve body.  (See <a href="#">CONTROL VALVE BODY REMOVAL [SJ6A-EL]</a> .)  (See <a href="#">CONTROL VALVE BODY INSTALLATION [SJ6A-EL]</a> .)
5	<ul style="list-style-type: none"><li>Inspect for bending, damage, corrosion or kinks of the oil cooler pipes.</li><li>Are oil cooler pipes normal?</li></ul>	Yes	Replace the transmission.  (See <a href="#">AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL]</a> .)
		No	Replace any malfunctioning parts.
6	<ul style="list-style-type: none"><li>Verify test results.<ul style="list-style-type: none"><li>If normal, return to the diagnostic index to service any additional symptoms.</li><li>If malfunction remains, inspect the related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis.<ul style="list-style-type: none"><li>If the vehicle is repaired, troubleshooting completed.</li><li>If the vehicle is not repaired or additional diagnostic information is not available, replace the TCM.</li></ul></li></ul></li></ul>		



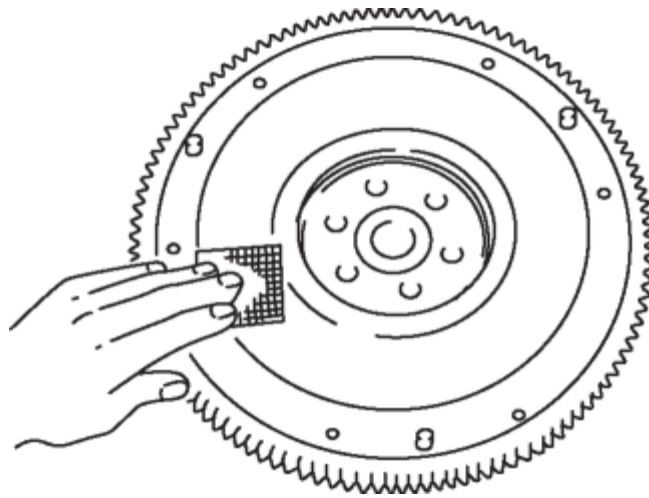
## 2008 - MX-5 - Transmission/Transaxle

### FLYWHEEL INSPECTION

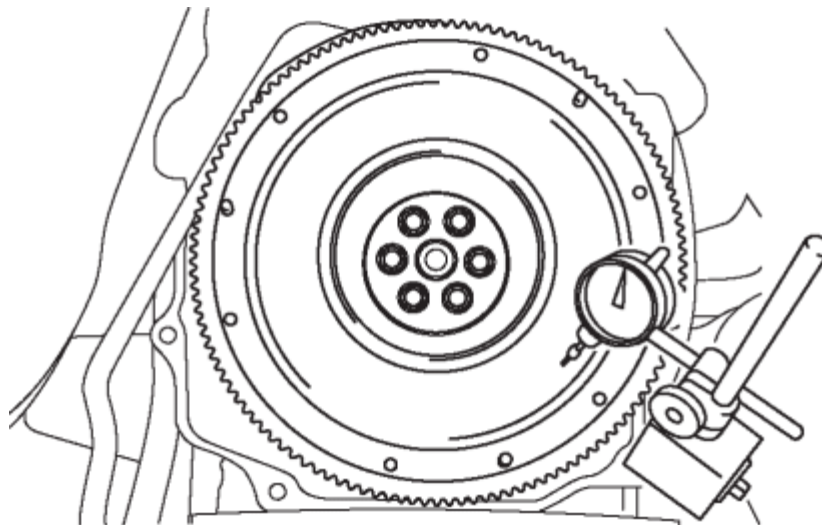
1. Remove the flywheel.

#### NOTE:

1. Correct slight scratches and discoloration using sandpaper.



2. Inspect the runout of the surface that contacts the clutch disc with the flywheel installed to the crankshaft.
2. Inspect the surface that contacts the clutch disc for scratches, nicks, and discoloration.
3. Inspect the ring gear teeth for damage and wear.
4. Install the flywheel.
5. Measure the runout of the surface that contacts the clutch disc using a dial gauge.



**Flywheel maximum runout**

- 0.1 mm {0.004 in}
- If it exceeds the maximum specification, replace the flywheel.

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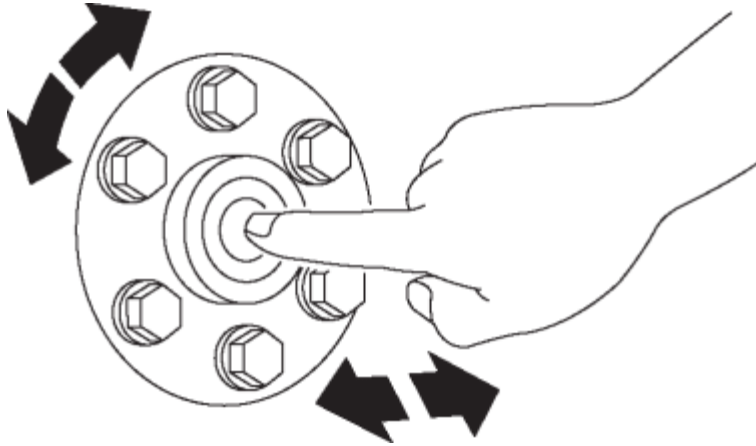
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## 2008 - MX-5 - Transmission/Transaxle

### PILOT BEARING INSPECTION

1. Without removing the pilot bearing, turn the bearing while applying force in the axial direction.

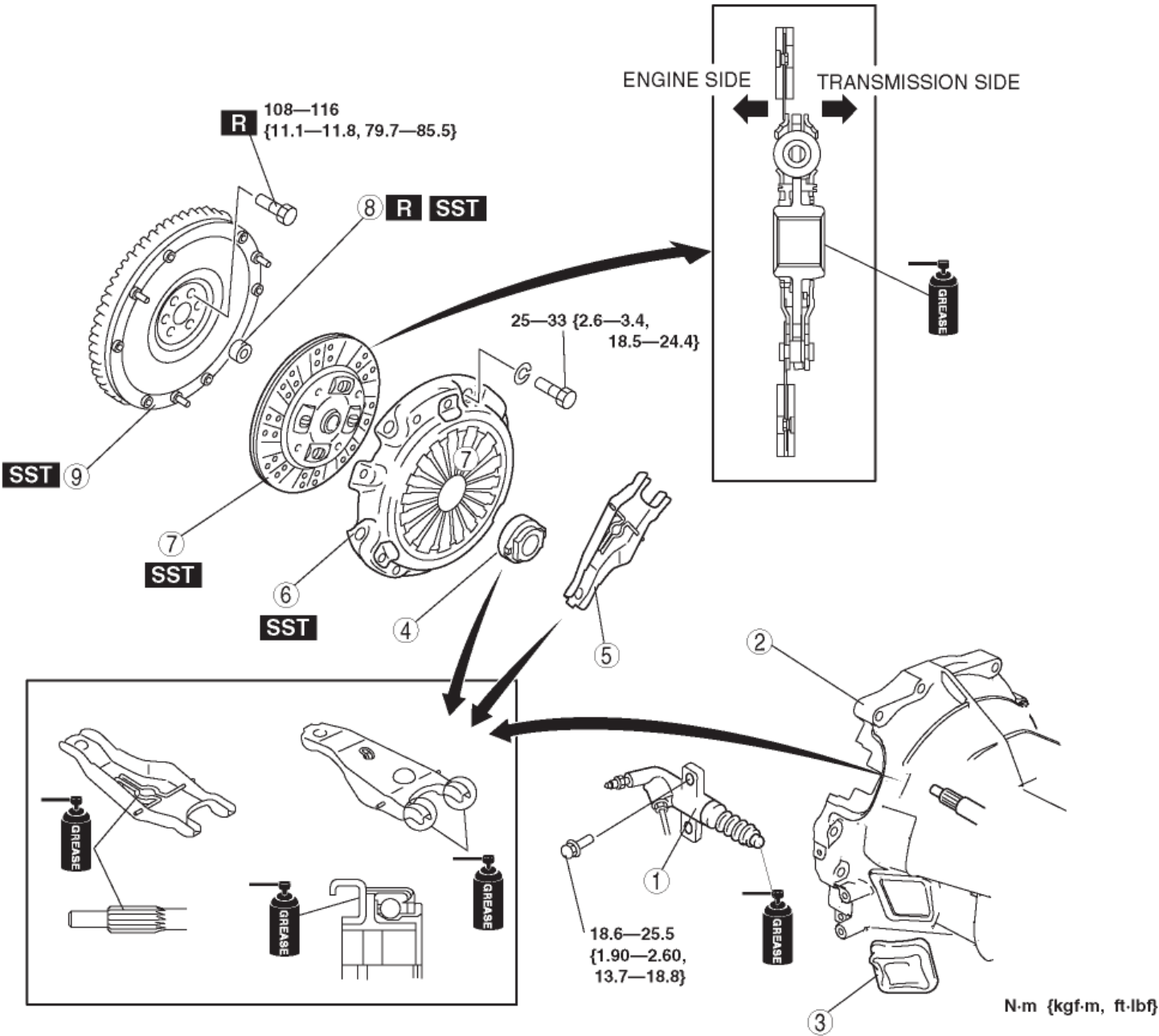
- If there is any malfunction, replace the pilot bearing.



2008 - MX-5 - Transmission/Transaxle

CLUTCH UNIT REMOVAL/INSTALLATION

- 1. Remove in the order indicated in the table.
- 2. Install in the reverse order of removal.

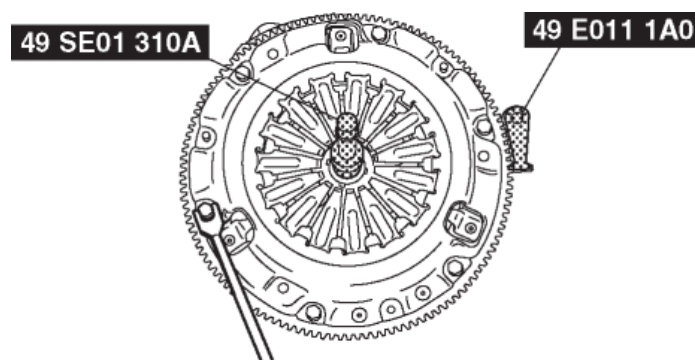


1 Clutch release cylinder  
(See [CLUTCH RELEASE CYLINDER REMOVAL/INSTALLATION.](#))

2	Manual transmission (See <a href="#">TRANSMISSION REMOVAL/INSTALLATION[P66M-DJ].</a> )
3	Boot
4	Clutch release collar (See <a href="#">CLUTCH RELEASE COLLAR INSPECTION.</a> )
5	Clutch release fork
6	Clutch cover (See <a href="#">Clutch Cover and Disc Removal Note.</a> ) (See <a href="#">Clutch Cover Installation Note.</a> )
7	Clutch disc (See <a href="#">Clutch Cover and Disc Removal Note.</a> ) (See <a href="#">Clutch Disc Installation Note.</a> )
8	Pilot bearing (See <a href="#">Pilot Bearing Removal Note.</a> ) (See <a href="#">Pilot Bearing Installation Note.</a> )
9	Flywheel (See <a href="#">Flywheel Removal Note.</a> ) (See <a href="#">Flywheel Installation Note.</a> )

### Clutch Cover and Disc Removal Note

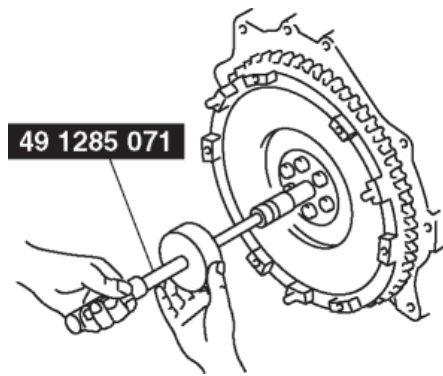
1. Install the **SSTs**.
2. Loosen each bolt one turn at a time in a crisscross pattern until spring tension is released.
3. Remove the clutch cover and disc.



### Pilot Bearing Removal Note

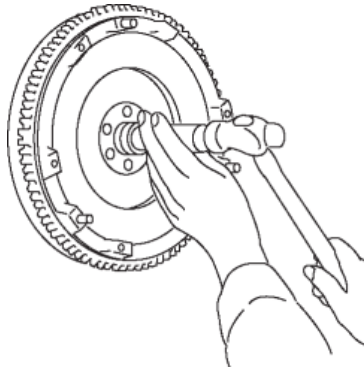
#### NOTE:

- The pilot bearing does not need to be removed unless you are replacing it.
1. Use the **SST** to remove the pilot bearing.



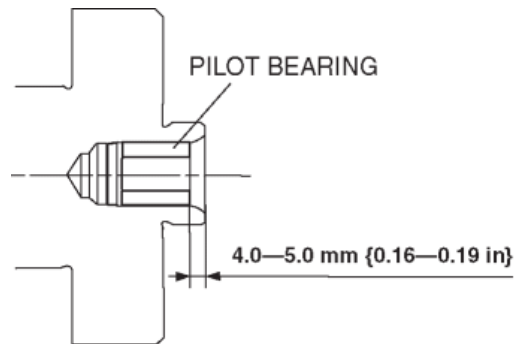
### Pilot Bearing Installation Note

1. Install the pilot bearing using the corresponding 20 mm {0.79 in} side of a Snap-on brand millimeter size bushing driver set A160M adapter A160M7 (20—22 mm {0.79—0.86 in}) or substitution tool.



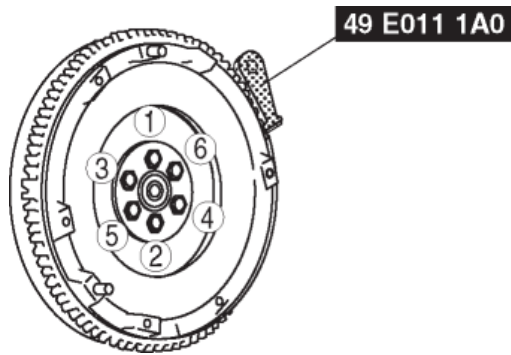
### Substitution tool

- Outer diameter: 21 mm {0.83 in}
- Inner diameter: 19 mm {0.75 in}



### Flywheel Removal Note

1. Hold the flywheel using the **SST**.
2. Remove the bolts evenly and gradually in a crisscross pattern.
3. Remove the flywheel.



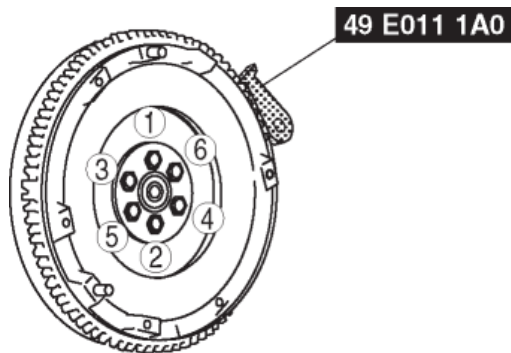
4. Inspect for oil leakage from the crankshaft rear oil seal.

- If there is any malfunction, replace the crankshaft rear oil seal.

(See [REAR OIL SEAL REPLACEMENT\[LF\]](#).)

### Flywheel Installation Note

1. Clean the crankshaft thread holes.
2. Install the flywheel to the crankshaft.
3. Hand tighten the flywheel lock bolts.
4. Install the **SST** to the flywheel.



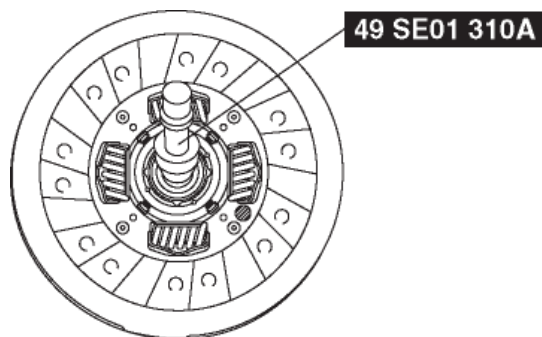
5. Gradually tighten the flywheel lock bolts in a crisscross pattern.

#### Tightening torque

- 108—116 N·m  
{ 11.1—11.8 kgf·m, 79.7—85.5 ft·lbf }

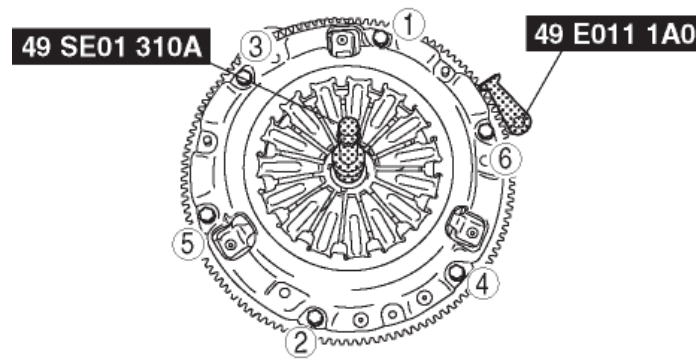
### Clutch Disc Installation Note

1. Hold the clutch disc position using the **SST**.



### Clutch Cover Installation Note

1. Install the **SSTs**.
2. Tighten the bolts evenly and gradually in a crisscross pattern.



#### Tightening torque

- 25.0—33.0 N·m  
{ 2.6—3.4 kgf·m, 18.5—24.4 ft·lbf }

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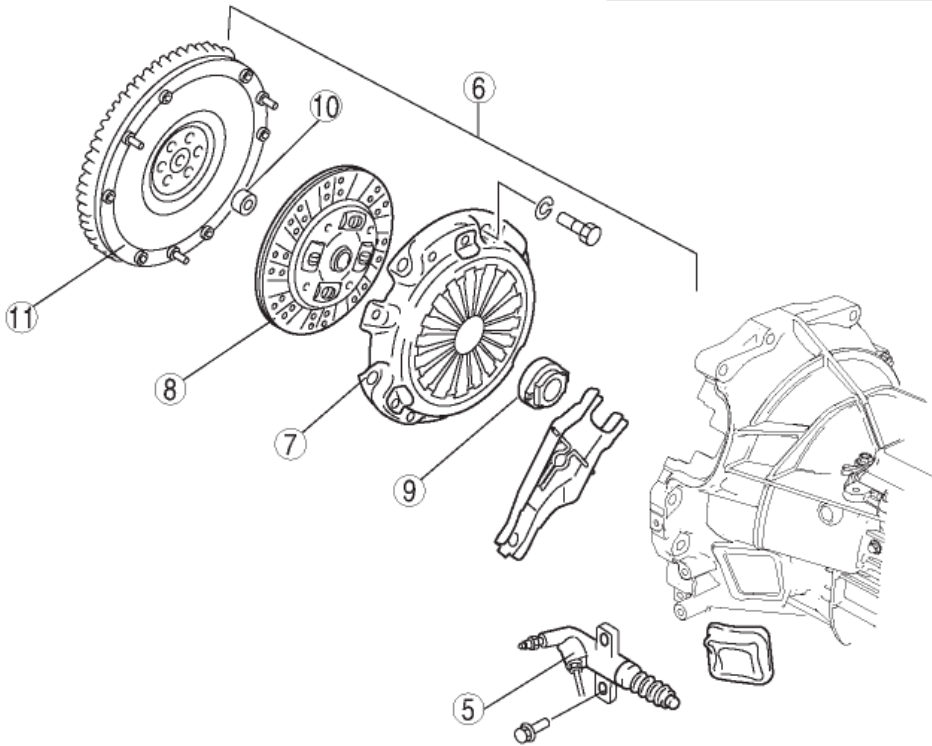
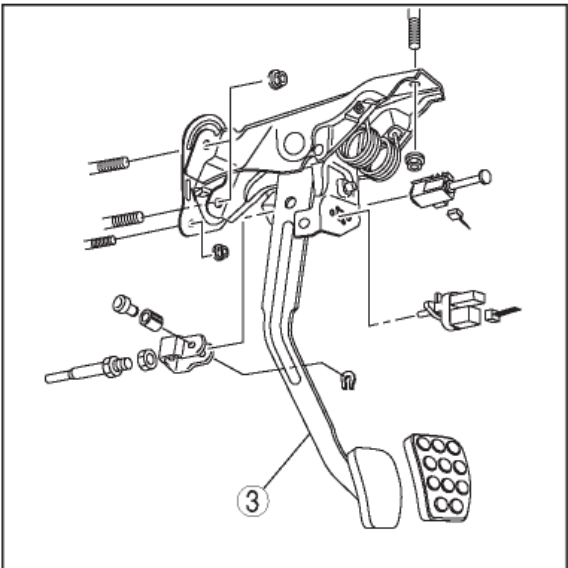
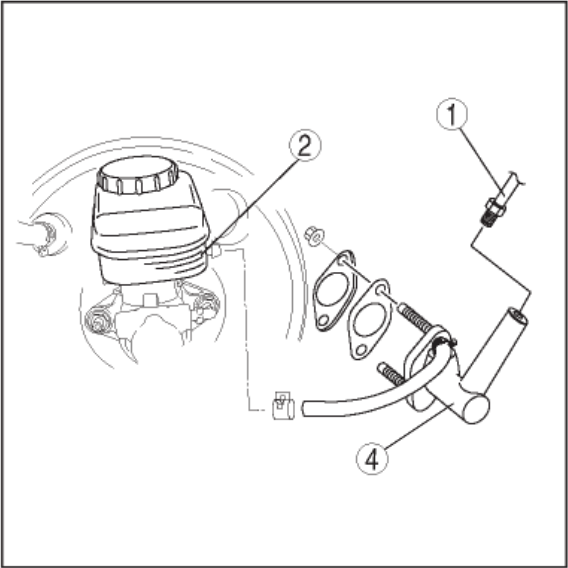
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CLUTCH LOCATION INDEX



1 Clutch pipe  
(See [GENERAL PROCEDURES \(CLUTCH\)](#).)

2 Brake fluid reservoir tank  
(See [CLUTCH FLUID INSPECTION](#).)

	(See <a href="#">CLUTCH FLUID REPLACEMENT</a> .)
3	Clutch pedal (See <a href="#">CLUTCH PEDAL INSPECTION/ADJUSTMENT</a> .) (See <a href="#">CLUTCH PEDAL REMOVAL/INSTALLATION</a> .)
4	Clutch master cylinder (See <a href="#">CLUTCH MASTER CYLINDER REMOVAL/INSTALLATION</a> .) (See <a href="#">CLUTCH MASTER CYLINDER DISASSEMBLY/ASSEMBLY</a> .)
5	Clutch release cylinder (See <a href="#">CLUTCH RELEASE CYLINDER REMOVAL/INSTALLATION</a> .) (See <a href="#">CLUTCH RELEASE CYLINDER DISASSEMBLY/ASSEMBLY</a> .)
6	Clutch unit (See <a href="#">CLUTCH UNIT REMOVAL/INSTALLATION</a> .)
7	Clutch cover (See <a href="#">CLUTCH COVER INSPECTION</a> .)
8	Clutch disc (See <a href="#">CLUTCH DISC INSPECTION</a> .)
9	Clutch release collar (See <a href="#">CLUTCH RELEASE COLLAR INSPECTION</a> .)
10	Pilot bearing (See <a href="#">PILOT BEARING INSPECTION</a> .)
11	Flywheel (See <a href="#">FLYWHEEL INSPECTION</a> .)

## 2008 - MX-5 - Transmission/Transaxle

### GENERAL PROCEDURES (CLUTCH)

#### CAUTION:

- Fluid will damage painted surfaces. Be careful not to spill any fluid on painted surfaces. If fluid does get on painted surfaces, wipe it off immediately.

#### NOTE:

- If any hydraulic related parts of the clutch system are removed during the procedure, add brake fluid, bleed the system and inspect for leakage after the procedure has been completed.

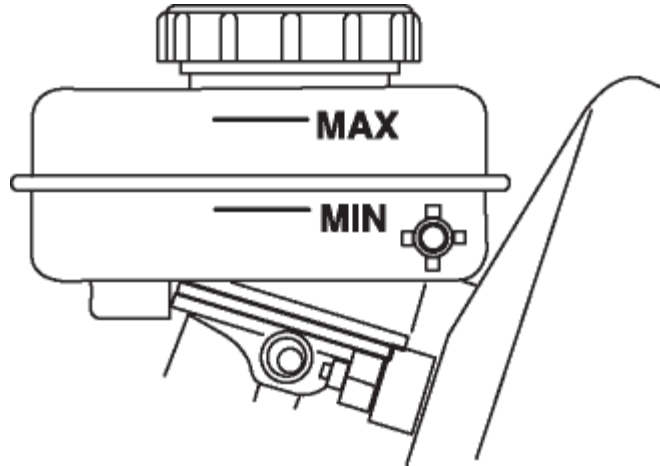
1. Remove the clutch pipe using the **SST** (49 0259 770B).
2. Install the clutch pipe using a torque wrench and the **SST** (49 0259 770B).

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## 2008 - MX-5 - Transmission/Transaxle

### CLUTCH FLUID INSPECTION

1. Inspect whether the fluid level in the brake fluid reservoir tank is between MIN and MAX.



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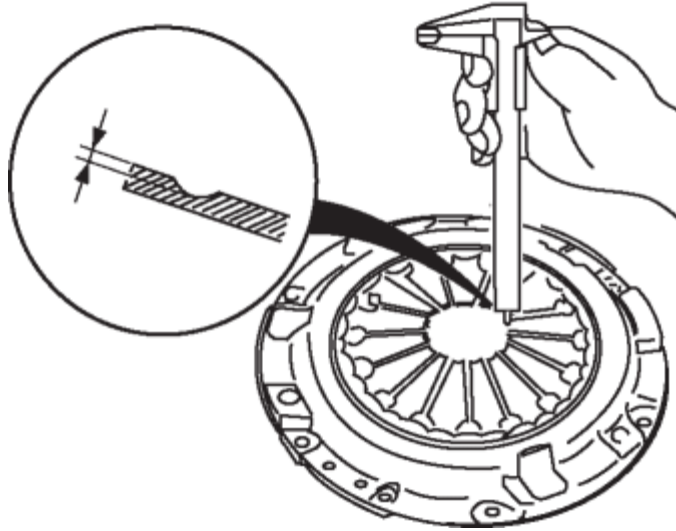
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## 2008 - MX-5 - Transmission/Transaxle

### CLUTCH COVER INSPECTION

1. Measure the wear of the diaphragm spring fingers.

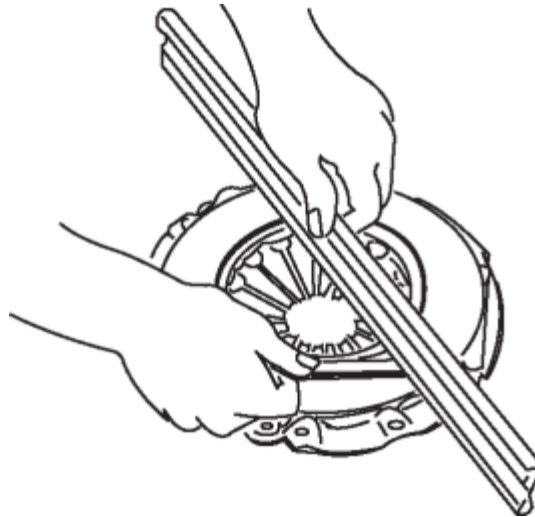


- If it exceeds the maximum specification, replace the clutch cover.

#### **Clutch disc maximum depth**

- 0.6 mm {0.024 in}

2. Measure the flatness of the pressure plate with a straight edge and a feeler gauge.



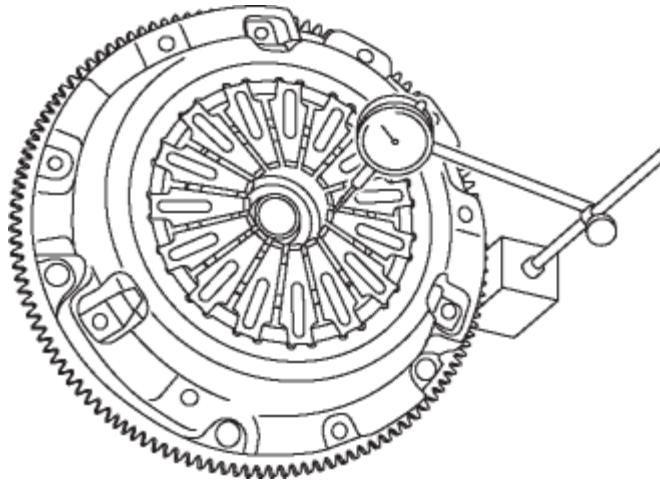
- If it exceeds the maximum specification, replace the clutch cover.

#### **Clutch cover maximum clearance**

- 0.5 mm {0.020 in}

3. When checking the diaphragm spring fingers, mount a dial indicator on the cylinder block.

4. Rotate the flywheel and check for misaligned diaphragm spring fingers.



- If it exceeds the maximum specification, replace the clutch cover.

**Clutch cover maximum height difference**

- 1.0 mm {0.039 in}

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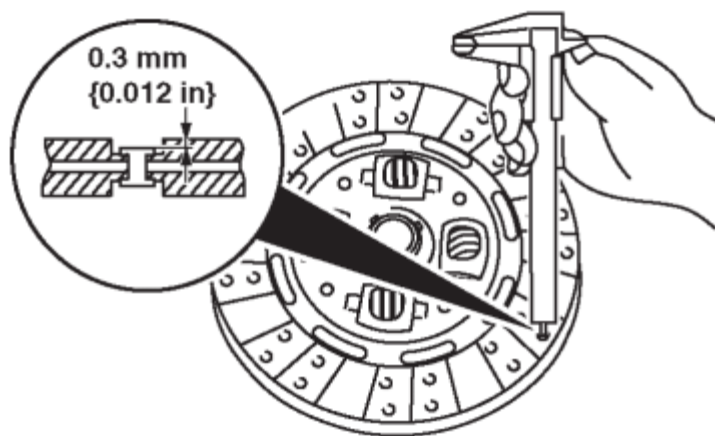
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## 2008 - MX-5 - Transmission/Transaxle

### CLUTCH DISC INSPECTION

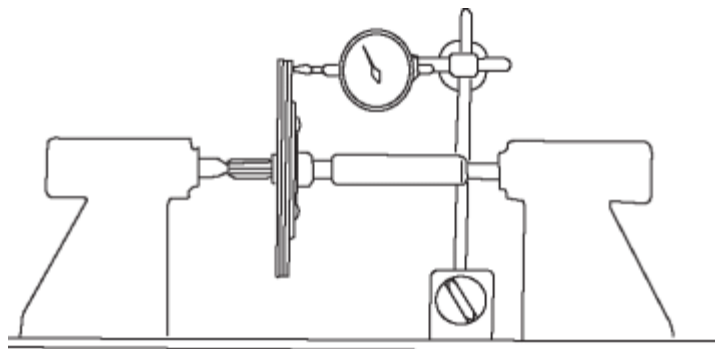
1. Remove the clutch disc.
2. Inspect the lining surface for discoloration and grease/oil contamination.
3. Inspect the torsion spring for weakness and the rivet for looseness.
4. Using a vernier caliper, measure the depth between the lining surface and the rivet head.



#### Clutch disc minimum depth

- 0.3 mm {0.012 in}
- If it is less than the minimum specification, replace the clutch disc.

5. Measure the clutch disc runout using a dial gauge.



#### Clutch disc maximum runout

- 0.7 mm {0.028 in}
- If it exceeds the maximum specification, replace the clutch disc.

6. Install the clutch disc.





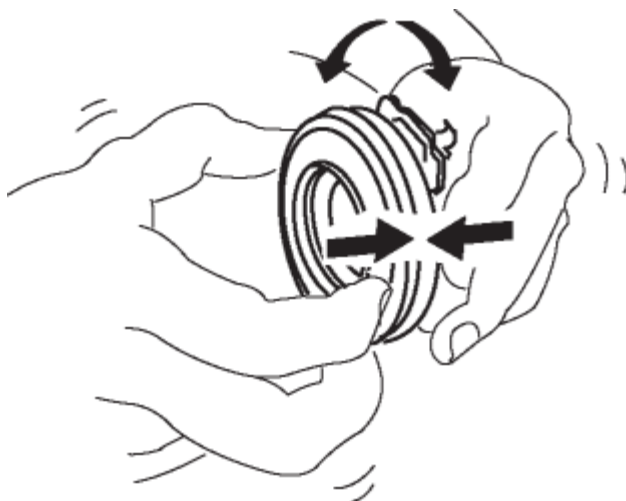
## 2008 - MX-5 - Transmission/Transaxle

### CLUTCH RELEASE COLLAR INSPECTION

#### CAUTION:

- Do not clean the clutch release collar with cleaning fluids or a steam cleaner because it is filled with grease.

1. Remove the clutch release collar.
2. Turn the collar while applying force in the axial direction, and inspect for sticking, excessive resistance, and an abnormal noise.



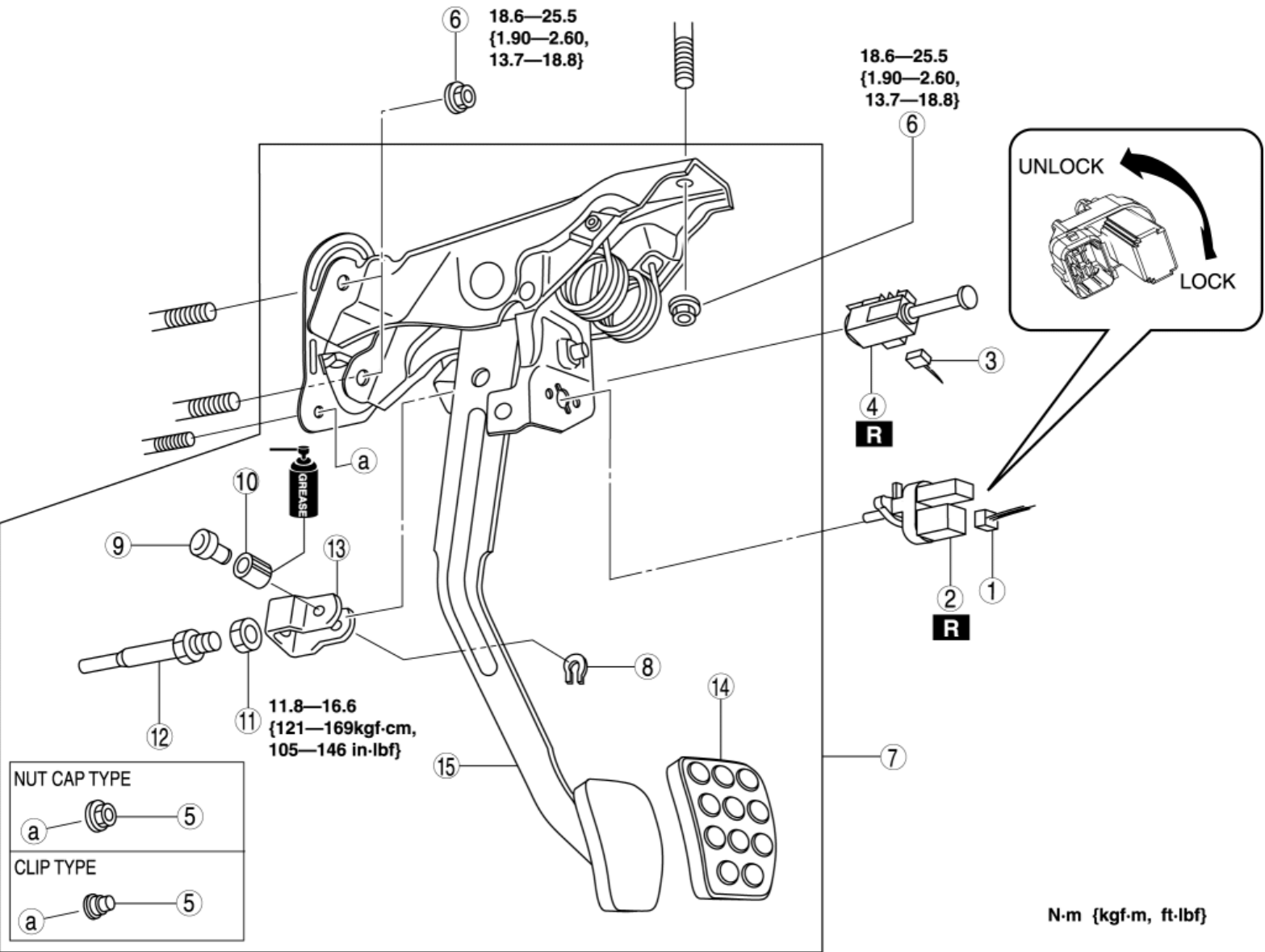
- If there is any malfunction, replace the clutch release collar.

3. Install the clutch release collar.

2008 - MX-5 - Transmission/Transaxle

CLUTCH PEDAL REMOVAL/INSTALLATION

- 1. Disconnect the negative battery cable.
- 2. Remove in the order indicated in the table.
- 3. Install in the reverse order of removal.
- 4. Fully depress the clutch pedal, and verify that the engine starts.



1	CPP switch connector
2	CPP switch
3	Starter interlock switch connector
4	Starter interlock switch

	(See <b>Starter Interlock Switch Installation Note.</b> )
5	Nut cap / Clip (See <b>Nut Cap Removal Note.</b> )
6	Nut
7	Clutch pedal component (See <b>Clutch Pedal Component Installation Note</b> )
8	Retaining ring
9	Joint pin
10	Bush
11	Nut
12	Push rod
13	Fork
14	Pedal pad
15	Clutch pedal

**Nut Cap Removal Note**

1. Dispose of the nut cap after removal.

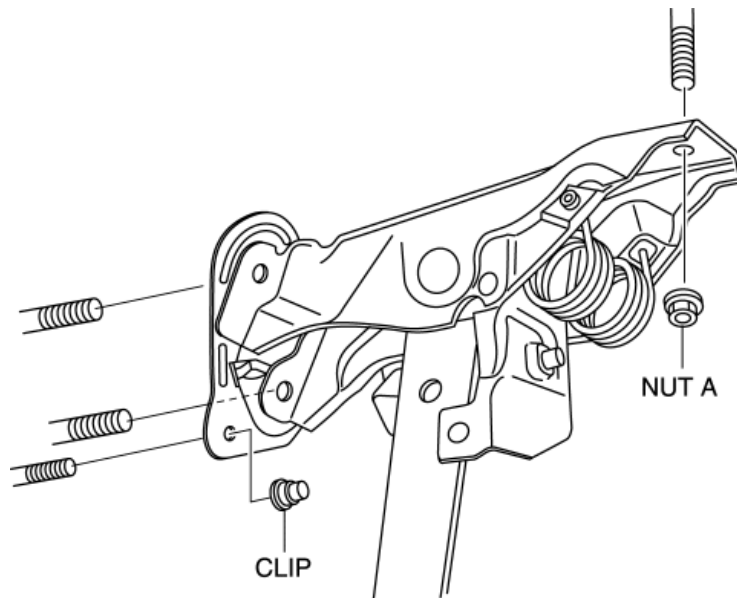
**NOTE:**

- When installing the clutch pedal, install the clip instead of the nut cap.

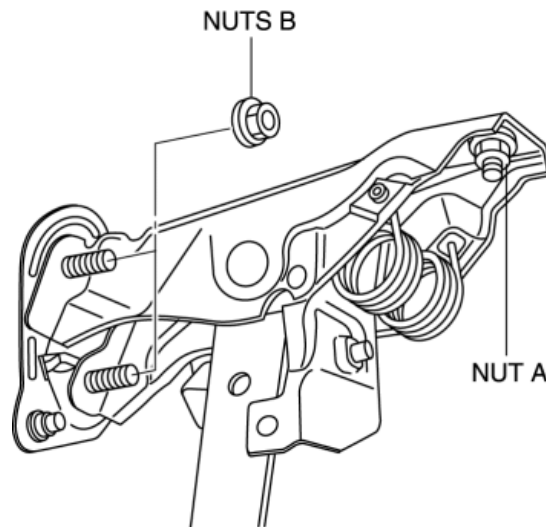
**Clutch Pedal Component Installation Note**

**CAUTION:**

- Always verify the tightening order for the clutch pedal installation nuts before performing the procedure. If there is a malfunction in the tightening order, it could result in bracket deformation.
1. Install the clutch pedal component, and then temporarily tighten the nut A.



2. Insert the clip completely so that the clutch pedal adheres to the installation surface and there are no gaps between them.
3. Tighten the nuts B(2).



#### **Tightening torque**

- 18.6—25.5 N·m { 1.90—2.60 kgf·m, 13.7—18.8 ft·lbf }

4. Tighten the nut A.

#### **Tightening torque**

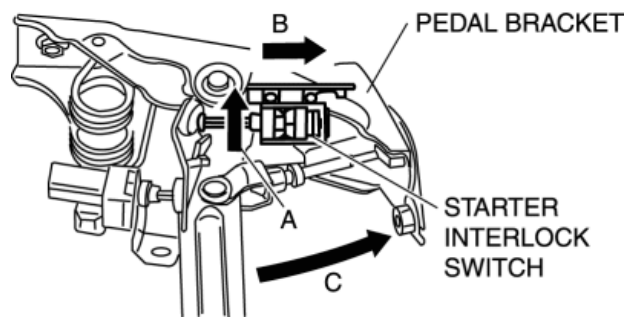
- 18.6—25.5 N·m { 1.90—2.60 kgf·m, 13.7—18.8 ft·lbf }

5. After installing the clutch pedal component, adjust/inspect the clutch pedal. (See [CLUTCH PEDAL INSPECTION/ADJUSTMENT](#).)

### **Starter Interlock Switch Installation Note**

#### **CAUTION:**

- If the rod is pushed in, it may not operate properly. Be careful not to push the rod in when installing the starter interlock switch.
1. Insert a new starter interlock switch into the pedal bracket hole in direction A.
  2. While pushing the starter interlock switch in direction A, slide it in direction B until it locks securely.
  3. Fully depress the clutch pedal in the direction of arrow C, and verify that a click sound from the starter interlock switch is heard.



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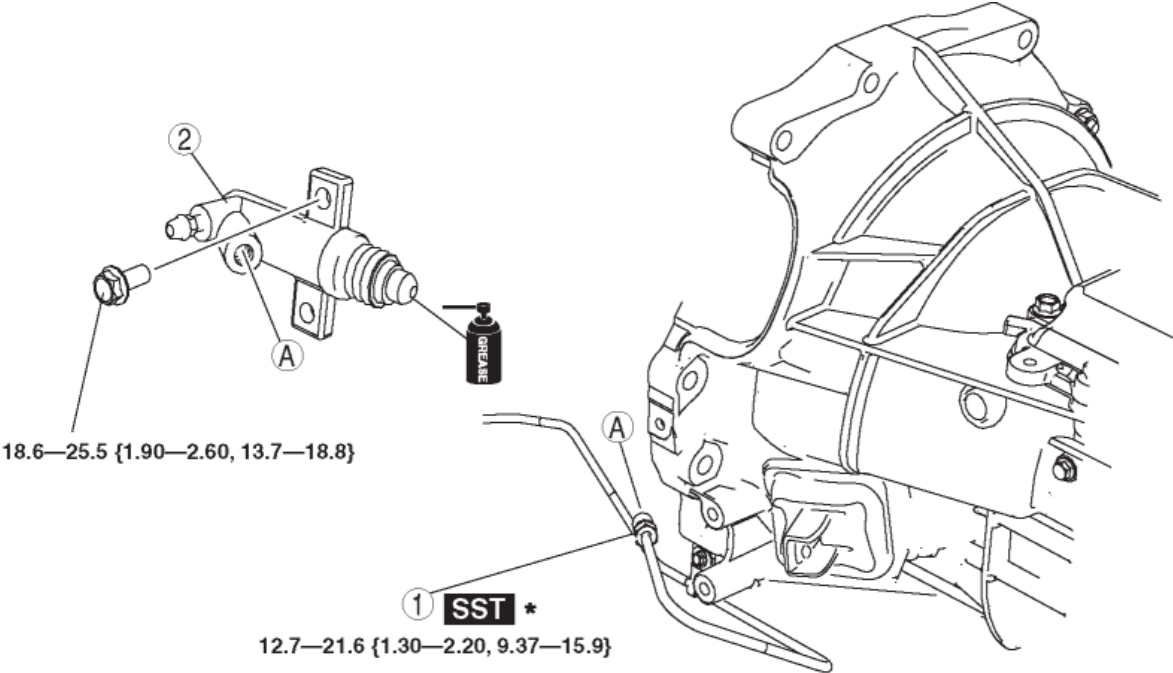
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2008 - MX-5 - Transmission/Transaxle

CLUTCH RELEASE CYLINDER REMOVAL/INSTALLATION

CAUTION:

- Fluid will damage painted surfaces. Be careful not to spill any fluid on painted surfaces. If fluid does get on painted surfaces, wipe it off immediately.
1. Remove in the order indicated in the table.
  2. Install in the reverse order of removal.
  3. Bleed the air from the system.  
(See **CLUTCH FLUID REPLACEMENT.**)
  4. Inspect and adjust the clutch pedal.  
(See **CLUTCH PEDAL INSPECTION/ADJUSTMENT.**)



\* 49 0259 770B

1	Clutch pipe
2	Clutch release cylinder

2008 - MX-5 - Transmission/Transaxle

CLUTCH MASTER CYLINDER REMOVAL/INSTALLATION

CAUTION:

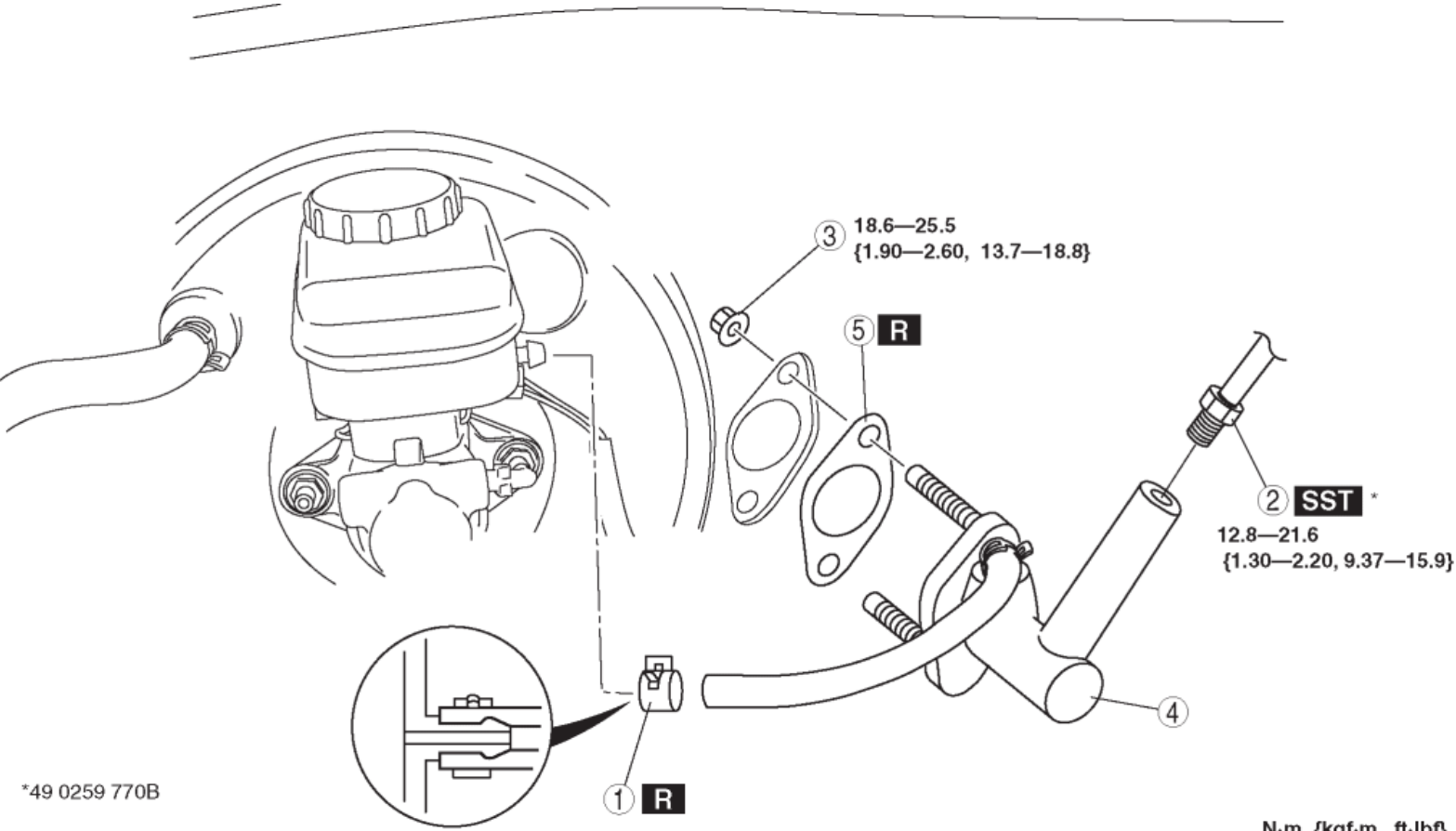
- Fluid will damage painted surfaces. Be careful not to spill any fluid on painted surfaces. If it is spilled, wipe it off immediately.

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. Bleed the air from the system.

(See **CLUTCH FLUID REPLACEMENT**.)

4. Inspect and adjust the clutch pedal.

(See **CLUTCH PEDAL INSPECTION/ADJUSTMENT**.)



N·m {kgf·m, ft·lb}

1	Hose clip
2	Clutch pipe
3	Nut
4	Clutch master cylinder



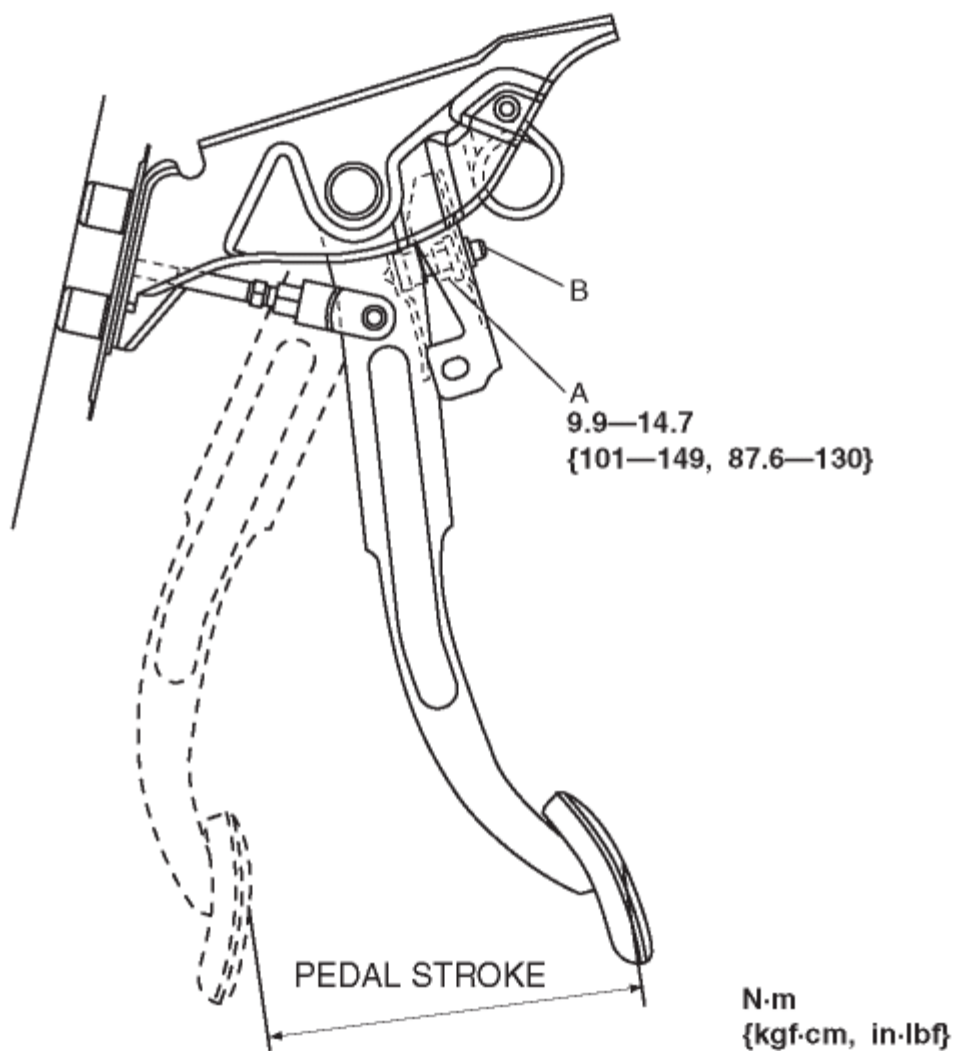


## 2008 - MX-5 - Transmission/Transaxle

### CLUTCH PEDAL INSPECTION/ADJUSTMENT

#### Clutch Pedal Stroke Inspection/Adjustment

1. Measure the clutch pedal stroke.



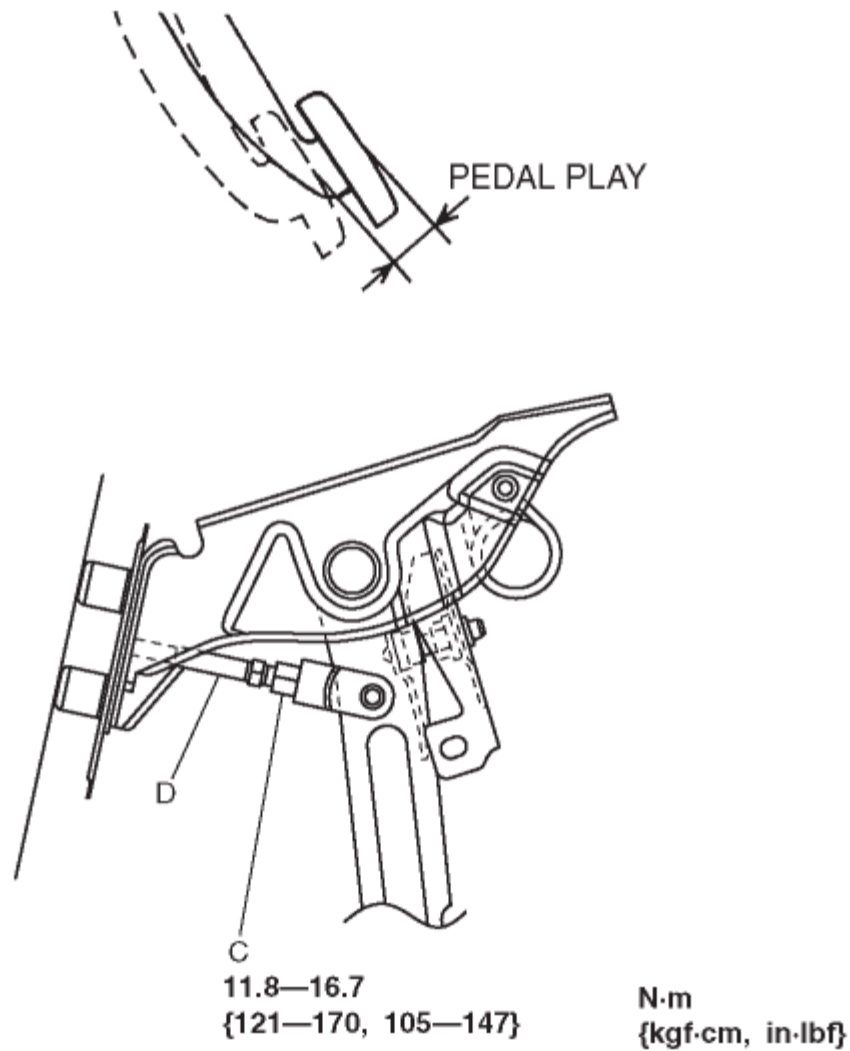
- If there is any malfunction, loosen locknut A and adjust the pedal stroke by adjusting bolt B. Tighten locknut A after adjustment.

#### Clutch pedal stroke

- 130 mm {5.12 in}

#### Clutch Pedal Play Inspection/Adjustment

1. Lightly depress the clutch pedal by hand until clutch resistance is felt and then measure the pedal play.



#### Clutch pedal play

- 5—15 mm {0.20—0.59 in}

#### Clutch pedal push rod play

- At push rod setting line: 0.1—0.5 mm {0.004—0.020 in} (Reference value)
- At pedal pad: 0.5—2.7 mm {0.020—0.106 in}

2. If it is not within the specification, loosen locknut C and turn push rod D to adjust the pedal play.

3. Remeasure the pedal play and, if it is within the specification, tighten locknut C.

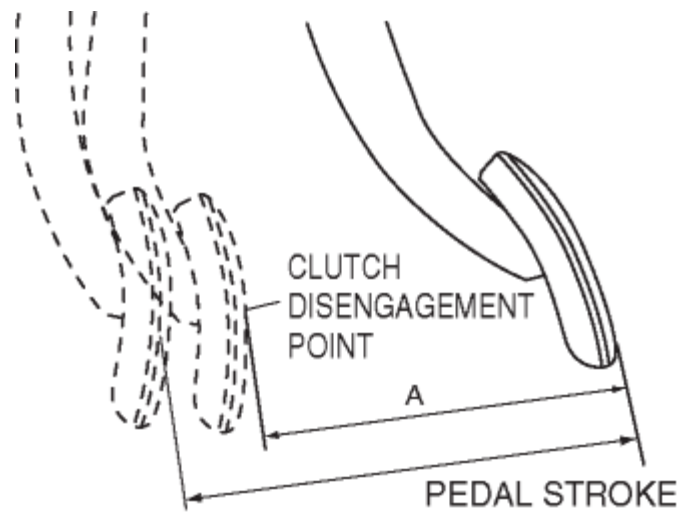
### Clutch Disengagement Point Inspection

1. Start the engine.
2. Without depressing the clutch pedal, move the shift lever slowly to the reverse position until

gear noise is heard and hold the lever in that position.

3. Slowly depress the clutch pedal and hold at the point where the gear noise stops (clutch disengagement point).

4. Measure distance A (from pedal not depressed to clutch disengagement point) and verify that it is within the specification.

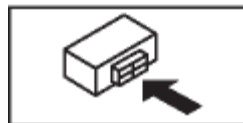
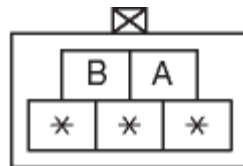


#### Clutch disengagement stroke (Reference value)

- A: 80—110 mm {3.15—4.33 in}

### Clutch Switch Inspection

1. Remove the engine cover.
2. Remove the battery cover.
3. Disconnect the negative battery cable.
4. Disconnect the clutch switch connector.
5. Verify continuity as indicated in the table.



○—○ : Continuity

Condition	Terminal	
	A	B
Clutch pedal depressed	○—	—○
Clutch pedal released		

- If there is any malfunction, replace the clutch switch.

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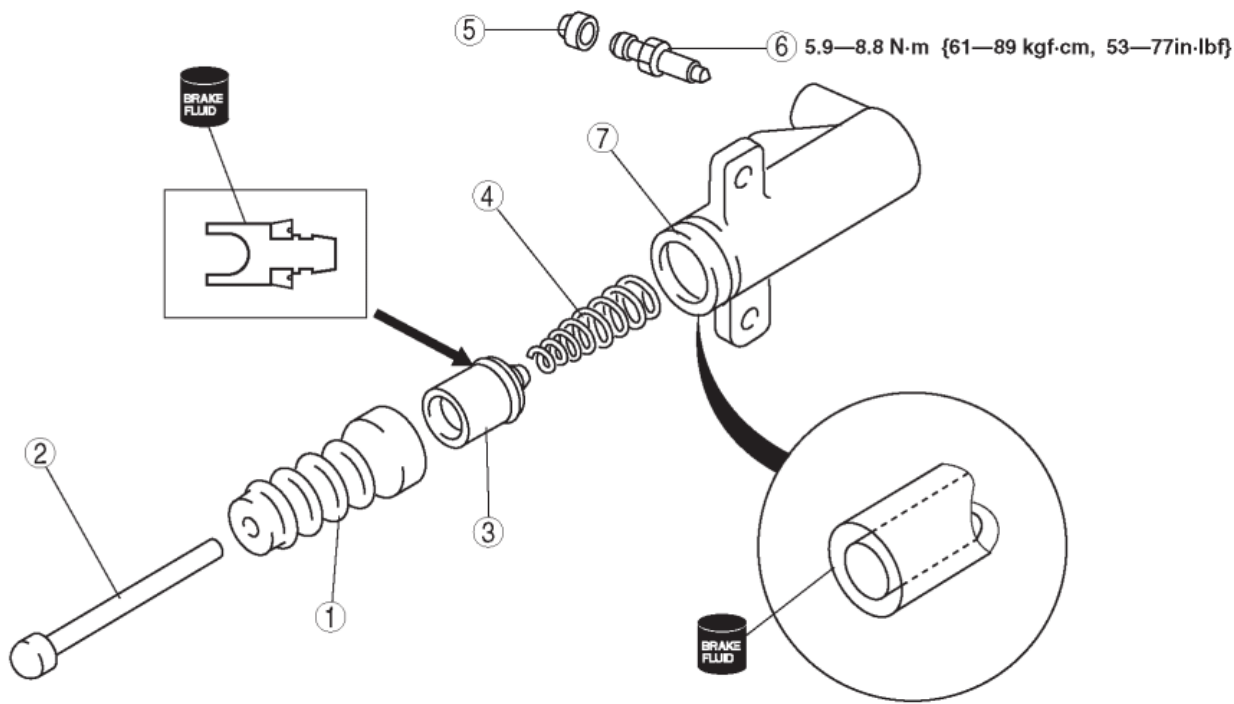
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2008 - MX-5 - Transmission/Transaxle

CLUTCH RELEASE CYLINDER DISASSEMBLY/ASSEMBLY

- 1. Disassemble in the order indicated in the table.
- 2. Assemble in the reverse order of disassembly.

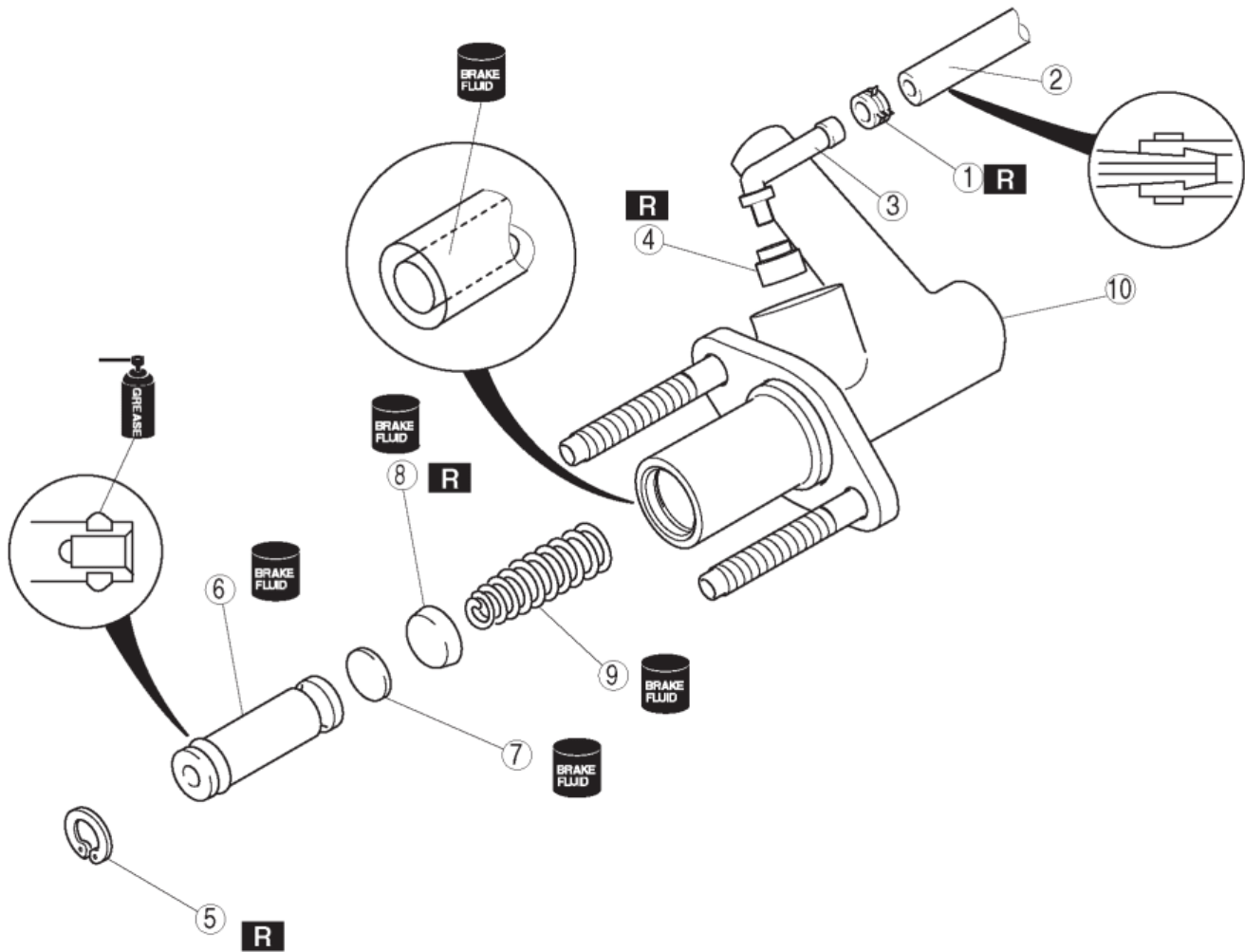


1	Boot
2	Push rod
3	Piston, piston cup component
4	Return spring
5	Bleeder cap
6	Bleeder screw
7	Clutch release cylinder body

2008 - MX-5 - Transmission/Transaxle

CLUTCH MASTER CYLINDER DISASSEMBLY/ASSEMBLY

- 1. Disassemble in the order indicated in the table.
- 2. Assemble in the reverse order of disassembly.

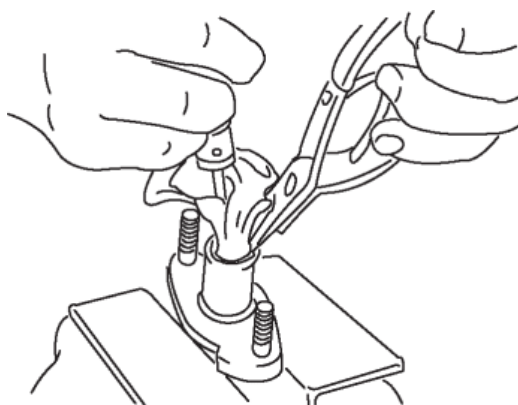


1	Hose clip
2	Reserve tank hose
3	Joint
4	Bushing
5	Snap ring
(See Snap Ring Disassembly/Assembly Note.)	

6	Piston, secondary cup component
7	Spacer
8	Primary cup
9	Return spring
10	Clutch master cylinder body

### Snap Ring Disassembly/Assembly Note

1. While pressing the piston in with a cloth-wrapped pin punch to protect the push rod contacting surface, remove/install the snap ring.



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## 2008 - MX-5 - Transmission/Transaxle

### CLUTCH FLUID REPLACEMENT

#### CAUTION:

- Fluid will damage painted surfaces. Be careful not to spill any fluid on painted surfaces. If fluid does get on painted surfaces, wipe it off immediately.
- Keep the fluid level in the reserve tank at 3/4 full or more during air bleeding.

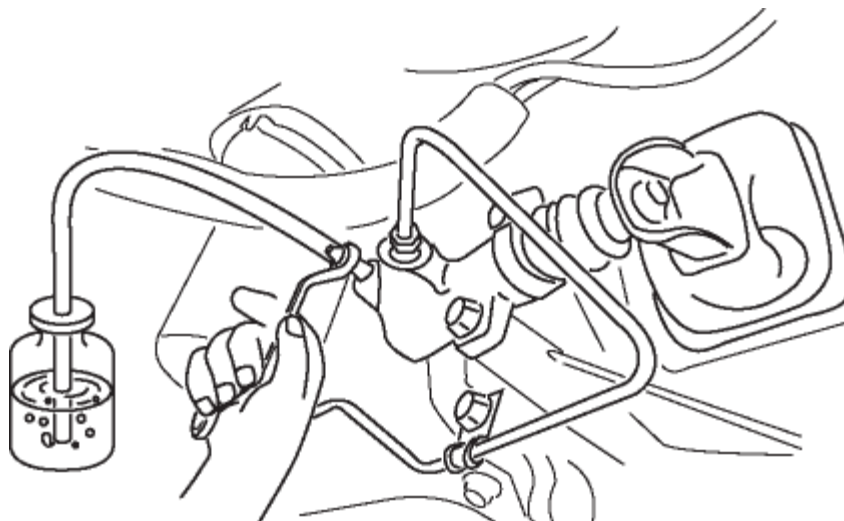
#### NOTE:

- When replacing the fluid, drain the old fluid, fill the reserve tank with new fluid and then perform Steps 1—6 below.

#### Clutch fluid

- SAE J1703, FMVSS 116 DOT-3

1. Remove the bleeder cap from the clutch release cylinder, and connect a vinyl hose to the bleeder plug.
2. Place the other end of the vinyl tube in a clear container, and fill fluid in the container during air bleeding.
3. Working with two people, one should depress the clutch pedal a few times and then depress and hold the pedal down.
4. While the clutch pedal is being held down, the other person should loosen the bleeder screw, and bleed any fluid containing air bubbles. Once completed, tighten the bleeder screw.
5. Continue to perform Steps 3 and 4 until no air comes from the vinyl hose.
6. Tighten the bleeder screw.



Tightening torque



5.9—8.8 N·m

{61—89 kgf·cm, 53—77 in·lbf}

7. Fill the reserve tank to MAX with the recommended fluid.

8. Perform the following inspections:

- Brake operation
- Fluid leakage
- Fluid level

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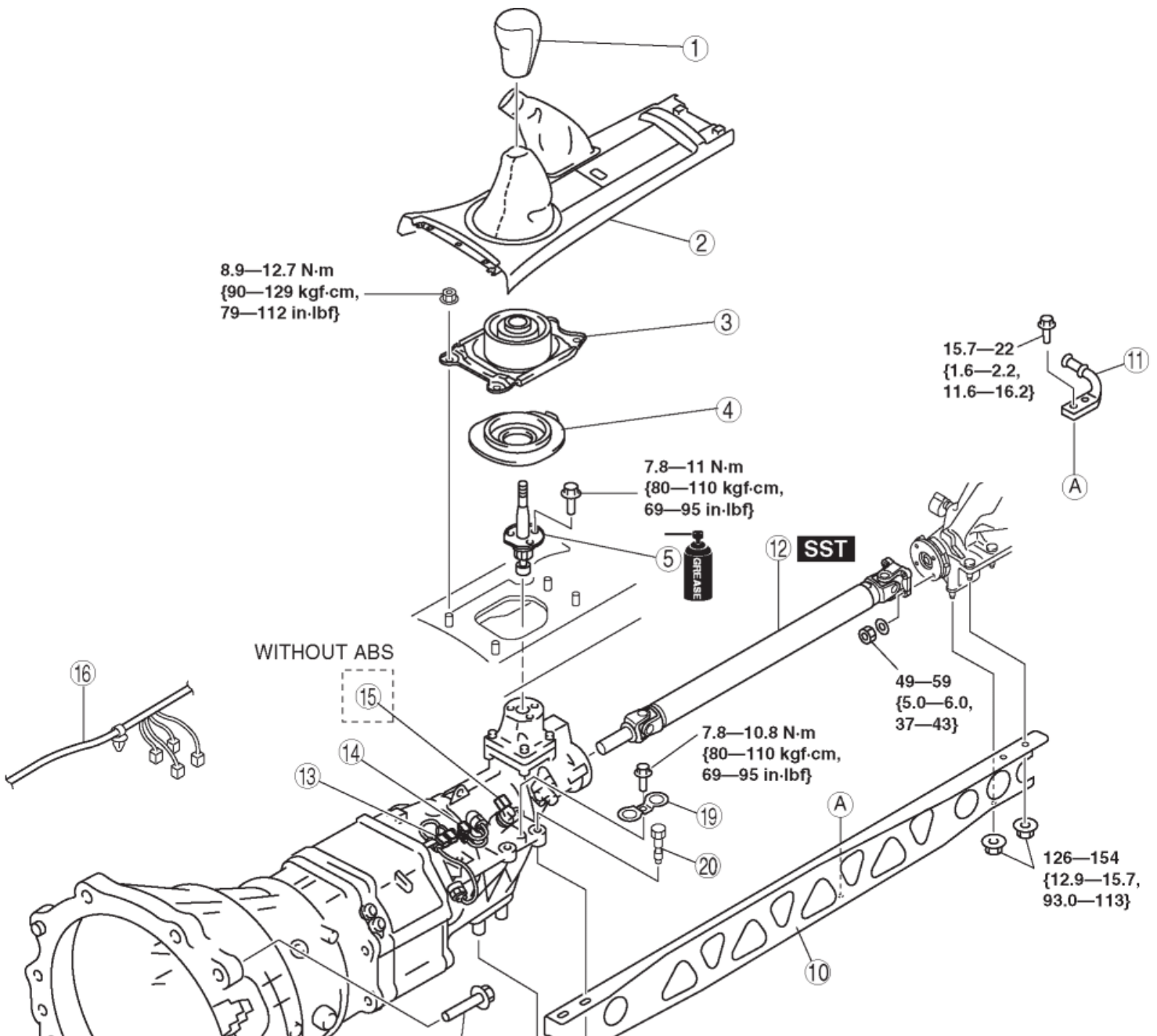
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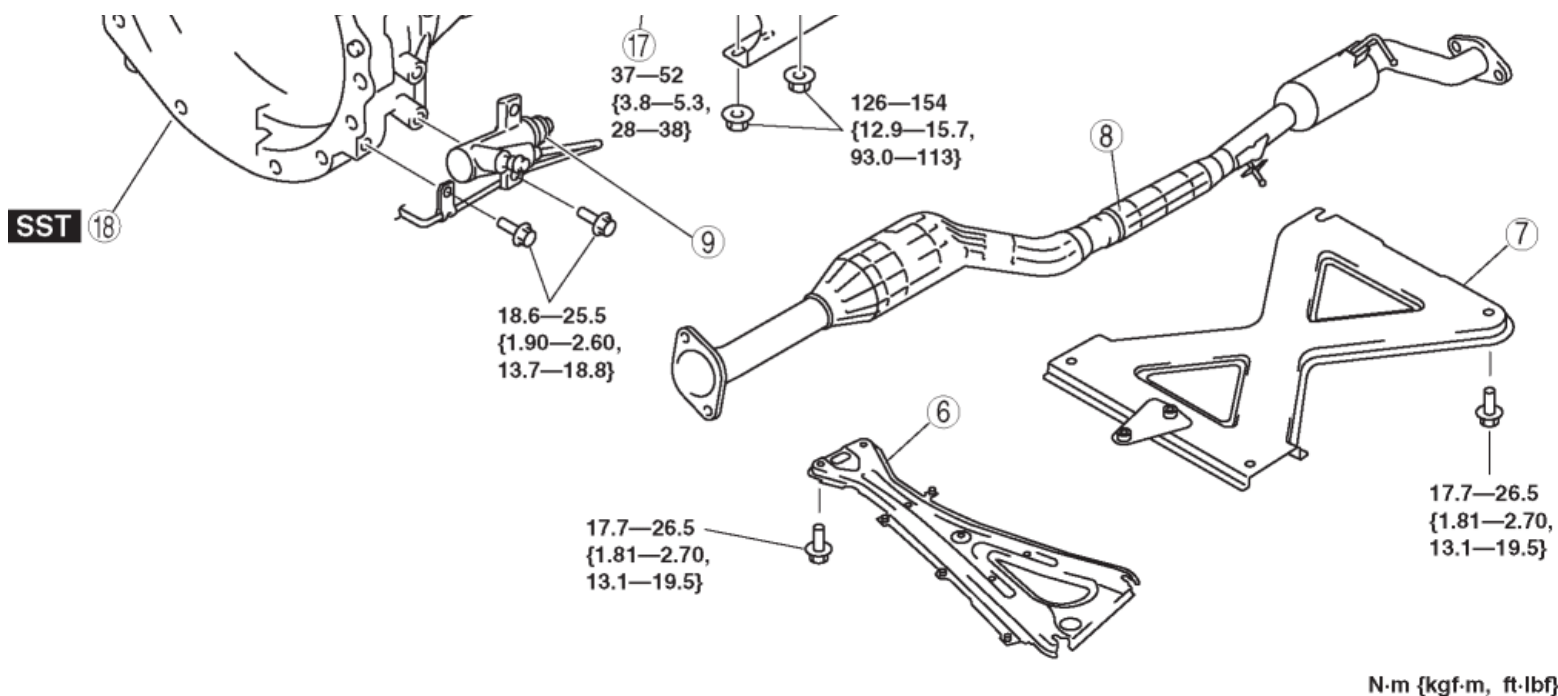
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## 2008 - MX-5 - Transmission/Transaxle

### TRANSMISSION REMOVAL/INSTALLATION [M15M-D]

1. Remove the battery cover. (See [BATTERY REMOVAL/INSTALLATION\[LF\]](#).)
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION\[LF\]](#).)
3. Loosen the starter installation bolts only enough that the starter is loose, but not removed.  
(See [STARTER REMOVAL/INSTALLATION\[LF\]](#).)
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. Perform the "INSPECTION AFTER TRANSMISSION INSTALLATION", and verify that there is no malfunction.  
(See [INSPECTION AFTER TRANSMISSION INSTALLATION\[M15M-D\]](#).)





1	Shift lever knob
2	Console
3	Shift insulator component (outer)
4	Shift insulator component (inner)
5	Shift lever component (See <a href="#">Shift Lever Component Installation Note.</a> )
6	Member bracket
7	Tunnel member
8	Catalytic converter, middle pipe (See <a href="#">EXHAUST SYSTEM REMOVAL/INSTALLATION[LF].</a> )
9	Clutch release cylinder (See <a href="#">CLUTCH RELEASE CYLINDER REMOVAL/INSTALLATION.</a> )
10	Power plant frame (See <a href="#">Power Plant Frame Removal Note.</a> ) (See <a href="#">Power Plant Frame Installation Note.</a> )
11	Hanger bracket
12	Propeller shaft (See <a href="#">Propeller Shaft Removal Note.</a> ) (See <a href="#">PROPELLER SHAFT REMOVAL/INSTALLATION.</a> )
13	Back-up light switch connector

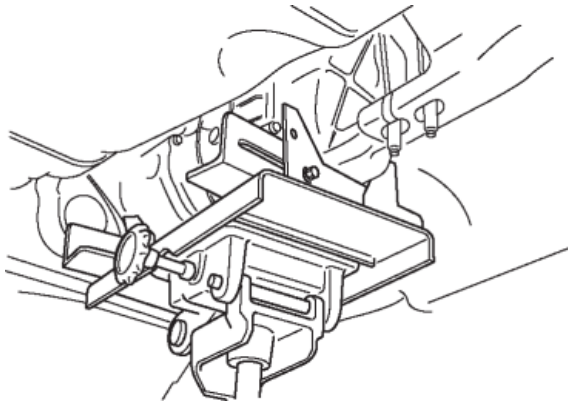
14	Neutral switch connector
15	Vehicle speed sensor connector
16	Wire
17	Transmission installation bolt
18	Transmission (See <a href="#">Transmission Removal Note.</a> ) (See <a href="#">Transmission Installation Note.</a> )
19	Stopper
20	Bolt

**CAUTION:**

- When removing/installing the transmission, be sure not to move the engine up and down more than necessary to prevent part interference with the engine.

**Power Plant Frame Removal Note**

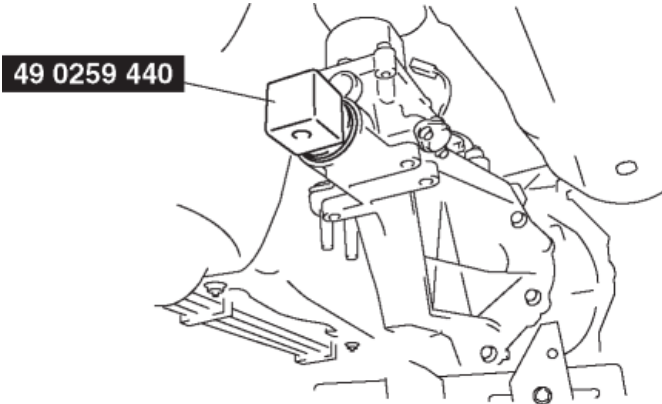
1. Support the transmission using a transmission jack.



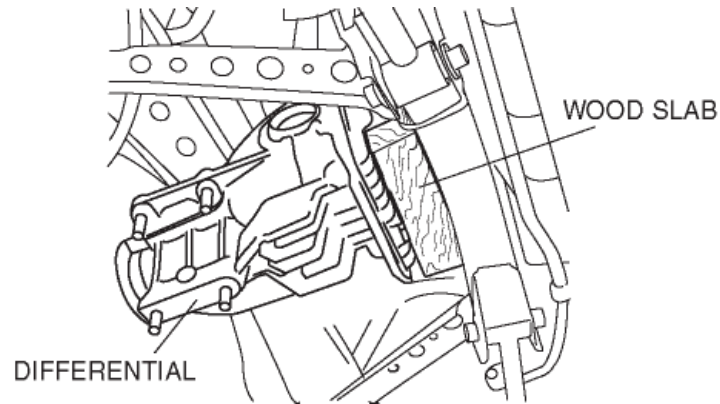
2. Remove the power plant frame.

**Propeller Shaft Removal Note**

1. Install the **SST** to the main shaft.



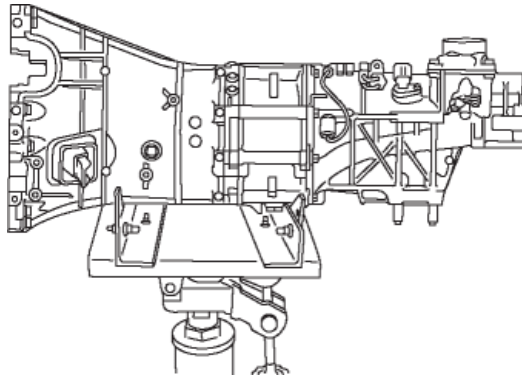
2. Insert a slab of wood behind the rear differential, and remove the propeller shaft.



### Transmission Removal Note

#### WARNING:

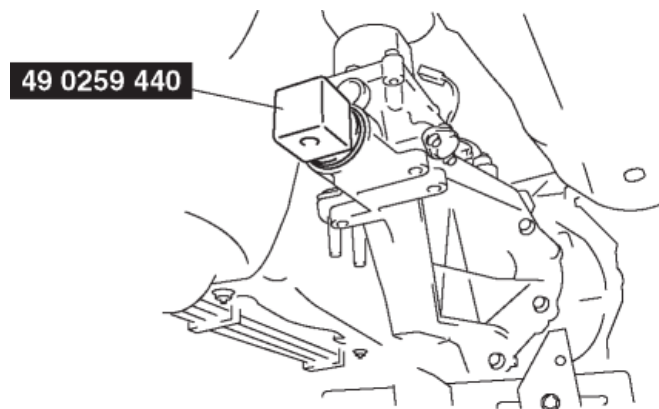
- Remove the transmission carefully, holding it steady. If the transmission falls it could be damaged or cause injury.
1. Support the transmission securely using a transmission jack.



2. Remove the transmission installation bolts.
3. Remove the transmission.

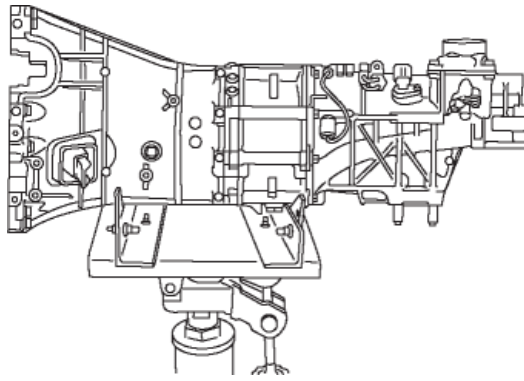
### Transmission Installation Note

1. Shift to any gear position.
2. Install the **SST** to the main shaft.



#### WARNING:

- Install the transmission carefully, holding it steady. If the transmission falls it could be damaged or cause injury.
3. Place the transmission on the transmission jack and raise it.

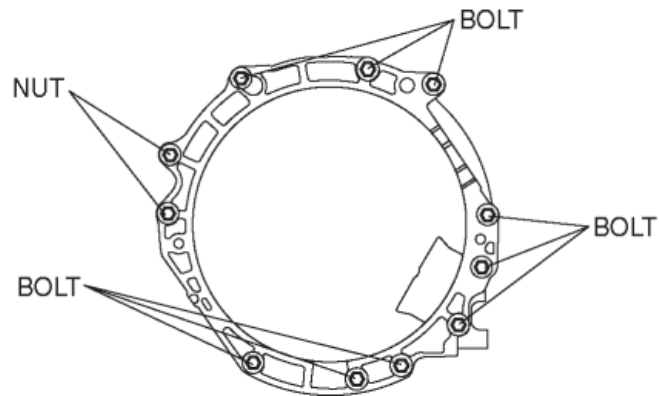


**NOTE:**

- Slowly rotate the **SST** to engage the clutch with the main drive gear spline, and install the transmission.

4. Install the transmission.

5. Tighten the transmission installation bolts and nuts.

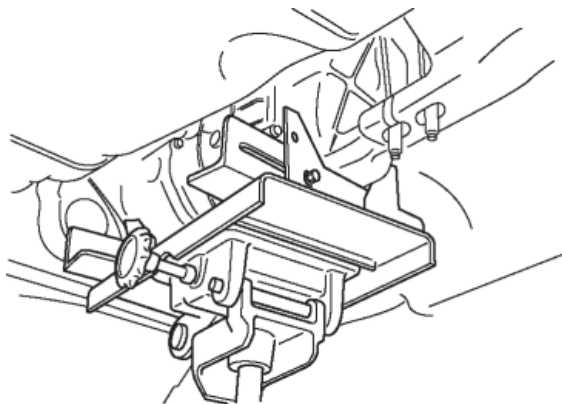


Tightening torque

- 37—52 N·m {3.8—5.3 kgf·m, 28—38 ft·lbf}

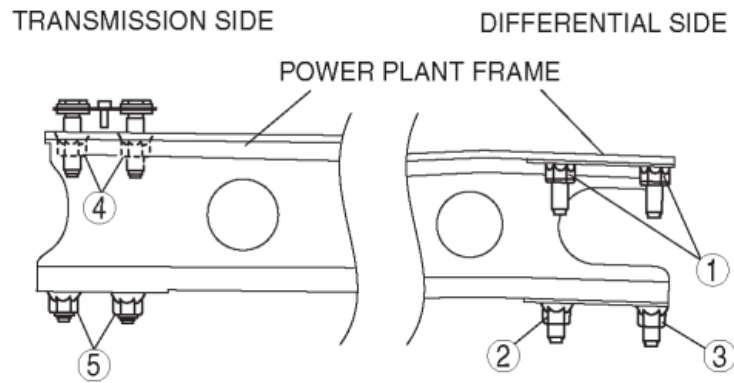
**Power Plant Frame Installation Note**

1. Support the transmission using a transmission jack.

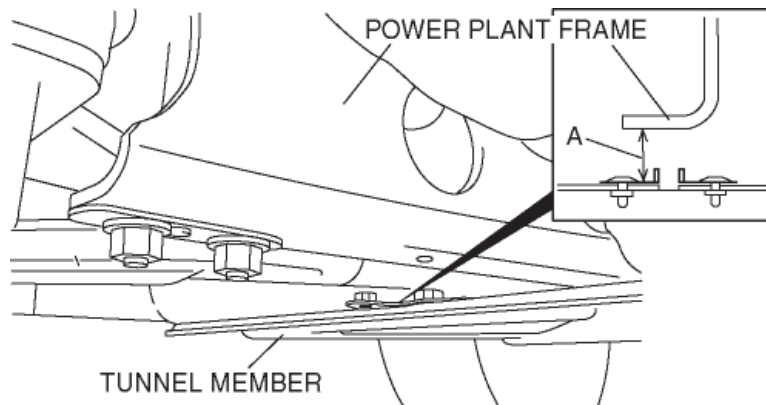


2. Install the power plant frame.

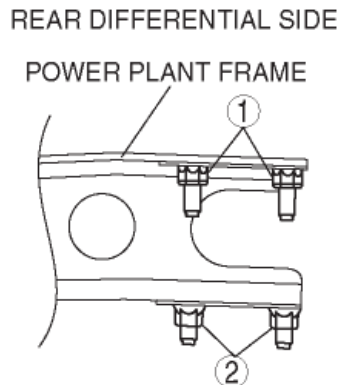
3. Temporarily tighten the nuts 1, 2, 3 in order shown in the figure.



4. Tighten nut 2 until the power plant frame is seated in the rear differential.
5. Temporarily tighten the nuts 4, 5 in order shown in the figure.
6. Install the catalytic converter, middle pipe and tunnel member.
7. Raise the front end of the power plant frame (transmission side) or the transmission with the transmission jack, and adjust dimension A to **26.7—34.7 mm {1.06—1.36 in}** (lower surface of power plant frame-upper surface of the tunnel member) as shown in the figure.



8. Tighten the nuts on the rear differential side in the order shown in the figure.

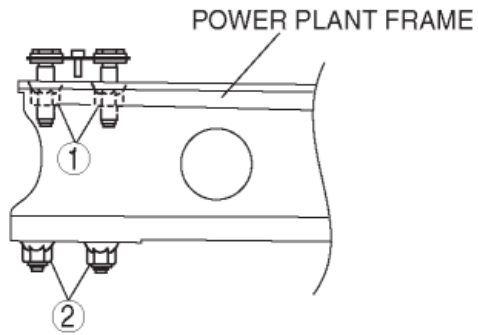


Tightening torque

- **126.0—154.0 N·m**  
**{ 12.9—15.7 kgf·m, 93.0—113 ft·lbf }**

9. Tighten the nuts on the transmission side in the order shown in the figure.

## TRANSMISSION SIDE



Tightening torque

- **126.0—154.0 N·m**  
**{ 12.9—15.7 kgf·m, 93.0—113 ft·lbf }**

10. Verify that dimension A is within the specification with the transmission jack removed.

- If it is not within the specification, adjust dimension A again.

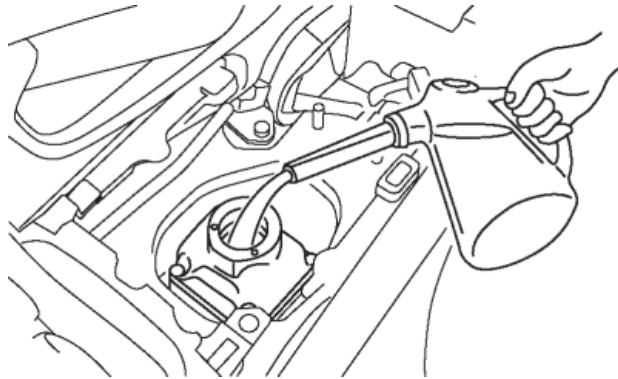
Standard dimension A

- 26.7—34.7 mm { 1.06—1.36 in }

## Shift Lever Component Installation Note

### NOTE:

- If the extension housing has been removed or the transmission has been disassembled and inspected, always add the specified type and amount of transmission oil.
1. Add the specified type and amount of oil to the shift control case.



### Shift control case specified oil grade

- API Service GL-4 or GL-5

### Shift control case specified oil viscosity

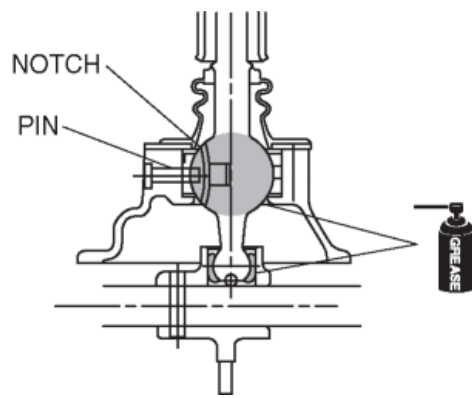
- SAE 75W-90

### Shift control case capacity (approx. quantity)

- 290—330 ml { 290—330 cc, 17.69—20.13 cu in }

2. Apply grease to the areas of the shift lever component as shown in the figure.





3. Align the shift lever component notch with the shift control case pin and install the shift lever component.

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## 2008 - MX-5 - Transmission/Transaxle

### INSPECTION AFTER TRANSMISSION INSTALLATION [M15M-D]

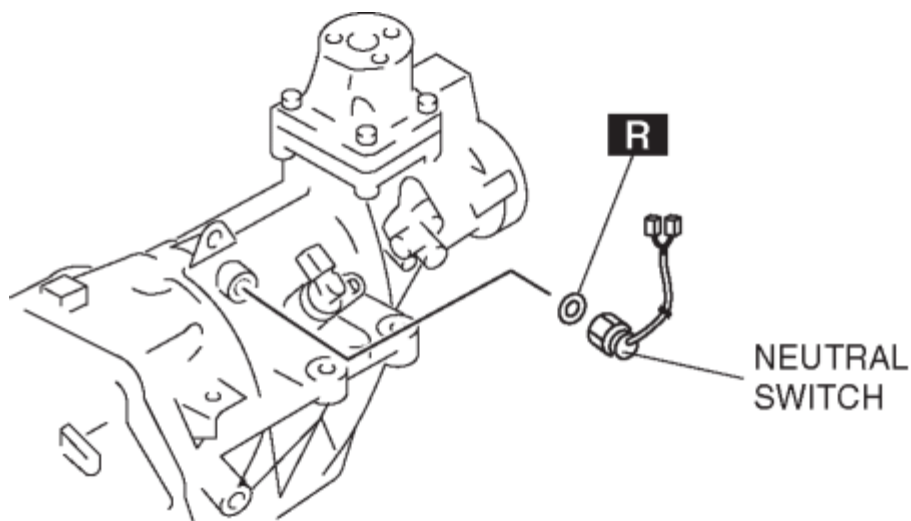
#### NOTE:

- Perform the following inspection only when the transmission has been overhauled.
1. Perform a road test and inspect the following items:
    - a. No abnormal noise in each shift position.
    - b. Smooth shift operation when shifting gears.
    - c. No gear slipout after shifting gears.
    - d. Back-up light switch operates correctly.

## 2008 - MX-5 - Transmission/Transaxle

### NEUTRAL SWITCH REMOVAL/INSTALLATION [M15M-D]

1. Remove the transmission. (See [TRANSMISSION REMOVAL/INSTALLATION\[M15M-D\]](#).)
2. Remove the neutral switch.



3. Install the neutral switch and a new packing to the transmission case.

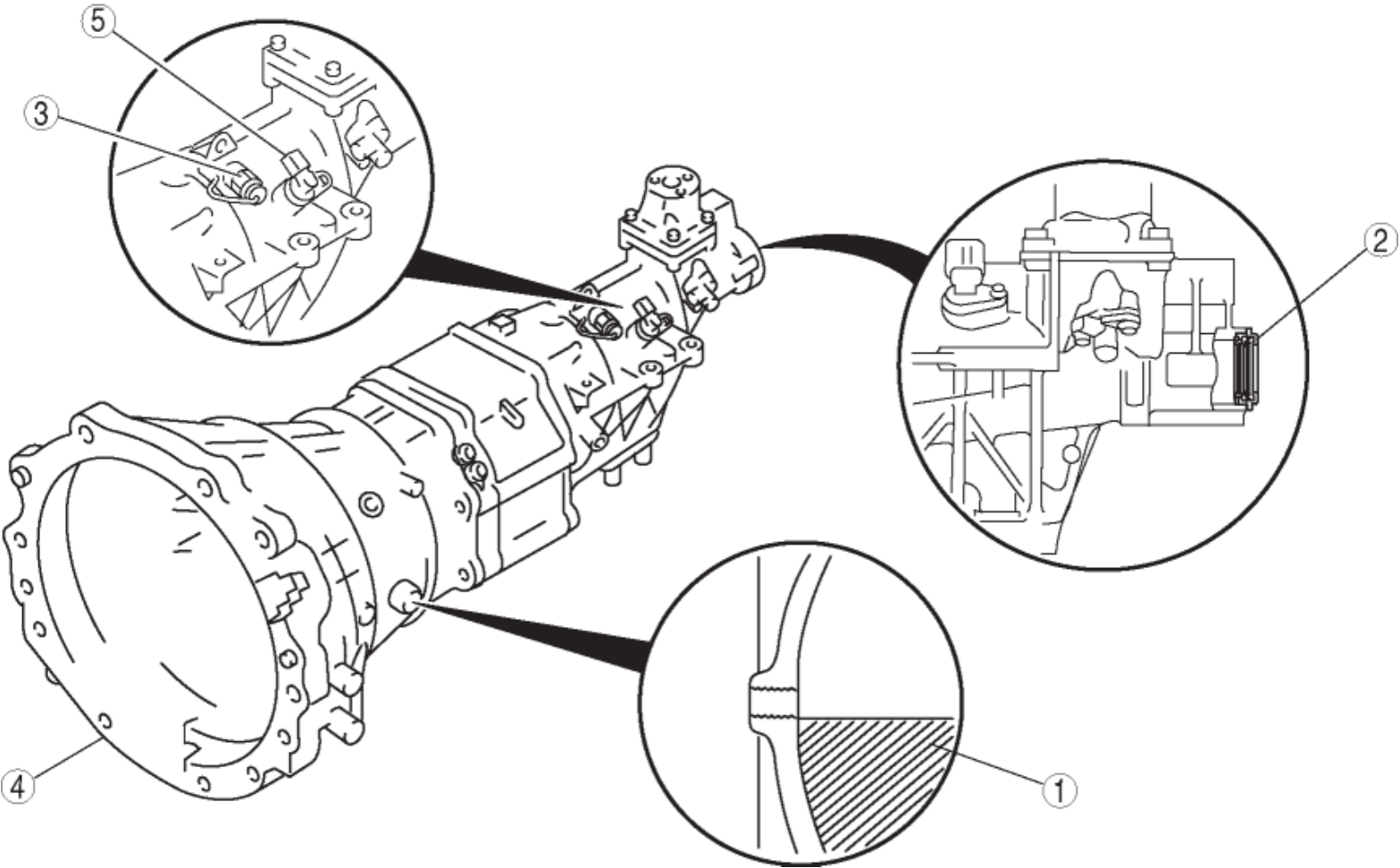
#### **Tightening torque**

- 25—34 N·m  
{ 2.6—3.4 kgf·m, 19—25 ft·lbf }

4. Install the transmission. (See [TRANSMISSION REMOVAL/INSTALLATION\[M15M-D\]](#).)

2008 - MX-5 - Transmission/Transaxle

MANUAL TRANSMISSION LOCATION INDEX [M15M-D]



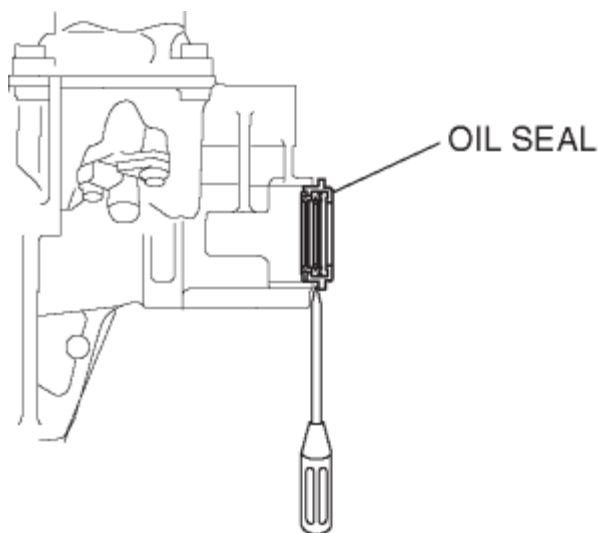
1	Transmission oil (See <a href="#">TRANSMISSION OIL INSPECTION[M15M-D]</a> .) (See <a href="#">TRANSMISSION OIL REPLACEMENT[M15M-D]</a> .)
2	Oil seal (extension housing) (See <a href="#">OIL SEAL (EXTENSION HOUSING) REPLACEMENT[M15M-D]</a> .)
3	Neutral switch (See <a href="#">NEUTRAL SWITCH REMOVAL/INSTALLATION[M15M-D]</a> .)
4	Transmission (See <a href="#">TRANSMISSION REMOVAL/INSTALLATION[M15M-D]</a> .)

	(See <a href="#">INSPECTION AFTER TRANSMISSION INSTALLATION[M15M-D]</a> .)
5	Vehicle speed sensor (without ABS) or hole cover (with ABS) (See <a href="#">VEHICLE SPEED SENSOR (VSS) INSPECTION[M15M-D]</a> .) (See <a href="#">VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION[M15M-D]</a> .)

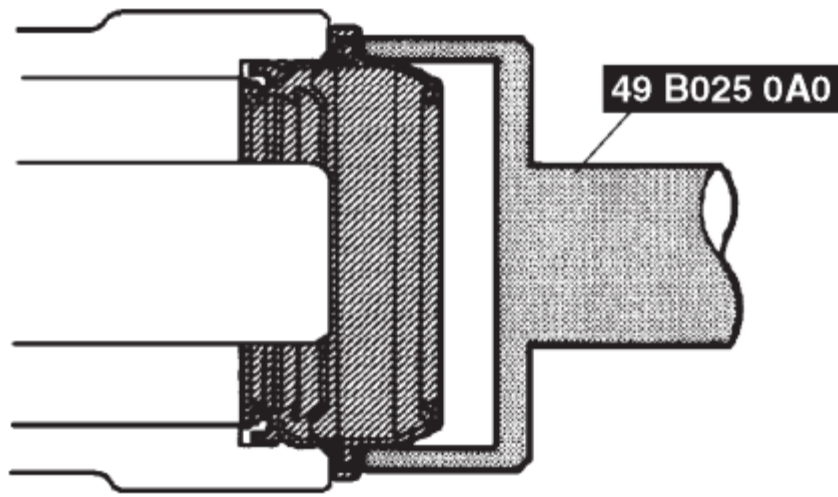
## 2008 - MX-5 - Transmission/Transaxle

### OIL SEAL (EXTENSION HOUSING) REPLACEMENT [M15M-D]

1. Position the vehicle on level ground.
2. Drain the transmission oil.  
(See [TRANSMISSION OIL REPLACEMENT\[M15M-D\]](#).)
3. Remove the following parts:
  - a. Member bracket (See [TRANSMISSION REMOVAL/INSTALLATION\[M15M-D\]](#).)
  - b. Tunnel member (See [TRANSMISSION REMOVAL/INSTALLATION\[M15M-D\]](#).)
  - c. Catalytic converter, middle pipe (See [EXHAUST SYSTEM REMOVAL/INSTALLATION\[LF\]](#).)
  - d. Propeller shaft (See [PROPELLER SHAFT REMOVAL/INSTALLATION](#).)
4. Remove the oil seal using a flathead screwdriver.



5. Tap a new oil seal into the case using the **SST**.



6. Apply the specified oil to the oil seal lip.

7. Install in the reverse order of removal.

8. Add transmission oil.

(See [TRANSMISSION OIL REPLACEMENT\[M15M-D\]](#).)

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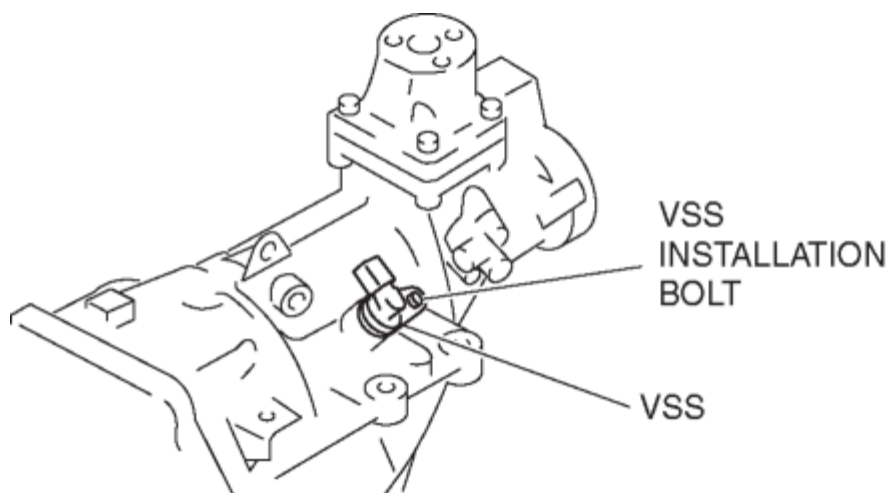
## 2008 - MX-5 - Transmission/Transaxle

### VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION [M15M-D]

#### CAUTION:

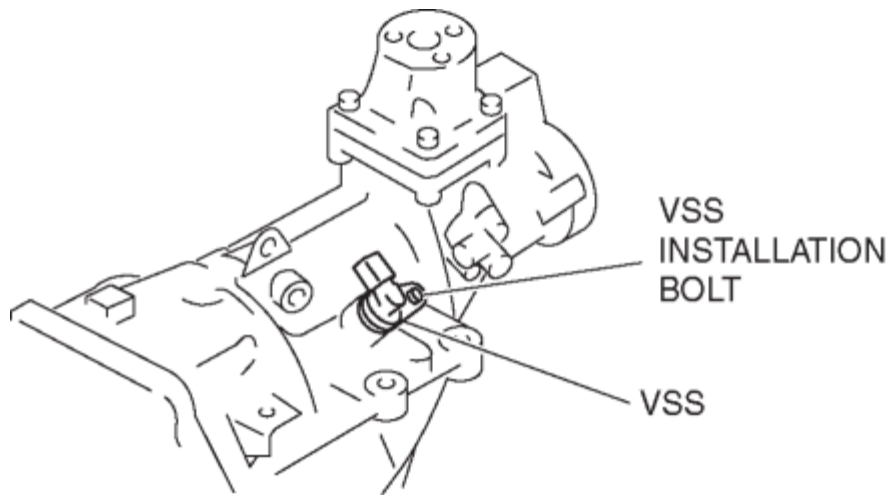
- Water or foreign material entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign material on the connector when disconnecting it.
- If foreign materials are stuck to the VSS, disturbance by magnetic flux can cause sensor output to be abnormal and thereby negatively affect control. Make sure that foreign materials such as iron filings are not stuck to the VSS during installation.

1. Remove the battery cover. (See [BATTERY REMOVAL/INSTALLATION\[LF\]](#).)
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION\[LF\]](#).)
3. Disconnect the VSS connector.
4. Remove the transmission. (See [TRANSMISSION REMOVAL/INSTALLATION\[M15M-D\]](#).)
5. Remove the VSS.



6. Apply the specified oil to a new O ring and install it on a new VSS.
7. Install the VSS.





### **Tightening torque**

- 8—11 N·m {82—112 kgf·cm, 71—97 in·lbf}

8. Install the transmission. (See [TRANSMISSION REMOVAL/INSTALLATION\[M15M-D\]](#).)
9. Connect the VSS connector.
10. Connect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION\[LF\]](#).)
11. Install the battery cover. (See [BATTERY REMOVAL/INSTALLATION\[LF\]](#).)

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## 2008 - MX-5 - Transmission/Transaxle

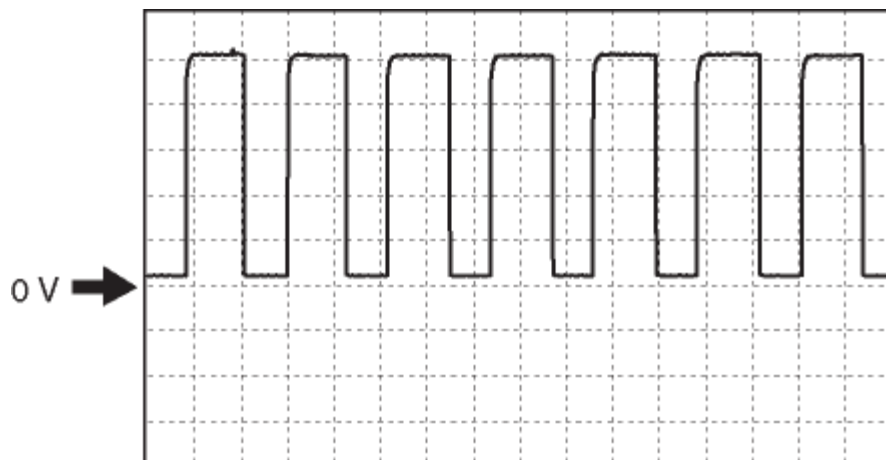
### VEHICLE SPEED SENSOR (VSS) INSPECTION [M15M-D]

#### Visual Inspection

1. Remove the VSS. (See [VEHICLE SPEED SENSOR \(VSS\) REMOVAL/INSTALLATION\[M15M-D\]](#).)
2. Verify that the sensor is free of any metallic shavings or particles.
  - If there is any malfunction, clean them off.
3. Install the VSS. (See [VEHICLE SPEED SENSOR \(VSS\) REMOVAL/INSTALLATION\[M15M-D\]](#).)

#### Wave Profile Inspection

1. Remove the PCM. (See [PCM REMOVAL/INSTALLATION\[LF\]](#).)
2. Connect M-MDS to DLC-2.
3. Connect oscilloscope test leads to the following PCM connector terminals.
  - (+) lead: PCM terminal 20
  - (-) lead: Negative battery terminal (-)
4. Start the engine.
5. Monitor VSS PID.
6. Inspect wave profile.



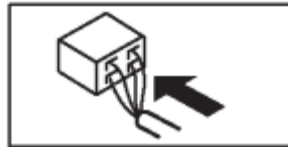
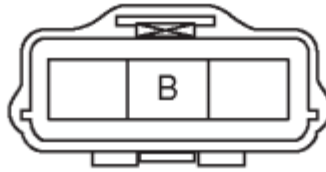
- Oscilloscope setting: 1 V/DIV (Y), 10 ms/DIV (X), DC range
- Vehicle condition: drive the vehicle at 10 km/h {6.2 mph}

- If there is any malfunction, perform the "Open Circuit Inspection" or "Short Circuit Inspection".

## Power Supply Voltage Inspection

1. Disconnect the VSS connector.
2. Turn the ignition switch to the ON position.
3. Measure voltage at VSS terminal B.

VSS  
WIRING HARNESS-SIDE CONNECTOR



### Vehicle speed sensor (VSS) voltage

- 4.5—5.5 V
- If voltage is normal, go to Open Circuit Inspection and Short Circuit Inspection.
- If there is any malfunction, repair wiring harness between VSS and PCM.

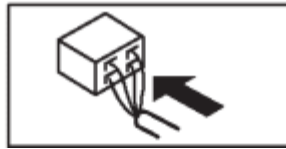
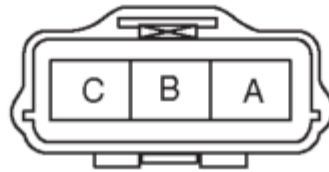
## Open Circuit Inspection

1. Inspect the following circuit for open.
  - Power circuit (VSS terminal A to main relay terminal D)
  - Ground circuit (VSS terminal C to GND)
  - If an open circuit or short circuit is found, repair the malfunctioning wiring harness.
  - If there are no open or short circuits, perform the sensor rotor inspection.

## Short Circuit Inspection

1. Inspect the following circuit for short circuit.

VSS  
WIRING HARNESS-SIDE CONNECTOR



- Power circuit (VSS terminal A to main relay terminal D)
- If an open circuit or short circuit is found, repair the malfunctioning wiring harness.
- If there are no open or short circuits, perform the sensor rotor inspection.

### Sensor Rotor Inspection

1. Remove the VSS. (See [VEHICLE SPEED SENSOR \(VSS\) REMOVAL/INSTALLATION\[M15M-D\]](#).)
2. Shift the shift lever to neutral position.
3. Inspect sensor rotor surface via VSS installation hole while rotating a rear tire manually.
  - a. Is the sensor rotor free of damage and cracks?
  - b. Is the sensor rotor free of any metallic shavings or particles?
    - If the sensor rotor is normal, replace the VSS.
    - If there is any malfunction, clean or replace the sensor rotor.

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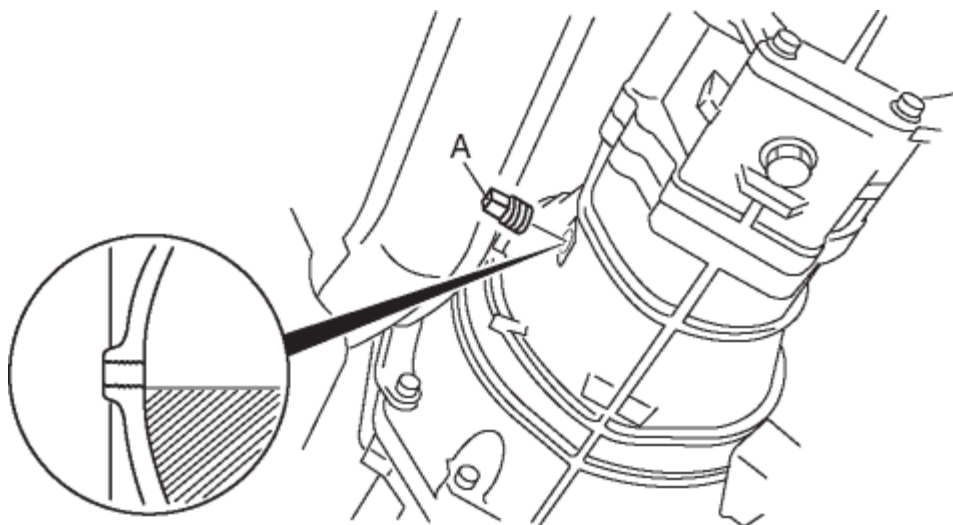
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## 2008 - MX-5 - Transmission/Transaxle

### TRANSMISSION OIL INSPECTION [M15M-D]

1. Position the vehicle on level ground.
2. Remove the check plug A.



3. Verify that the oil is at the brim of the check plug hole as shown.
  - If it is low, add the specified oil from the check plug hole.

#### **Specified oil grade**

- API Service GL-4 or GL-5

#### **Specified oil viscosity**

- All season: SAE 75W-90
- Above 10°C {50°F}: SAE 80W-90

4. Install the new check plug A.

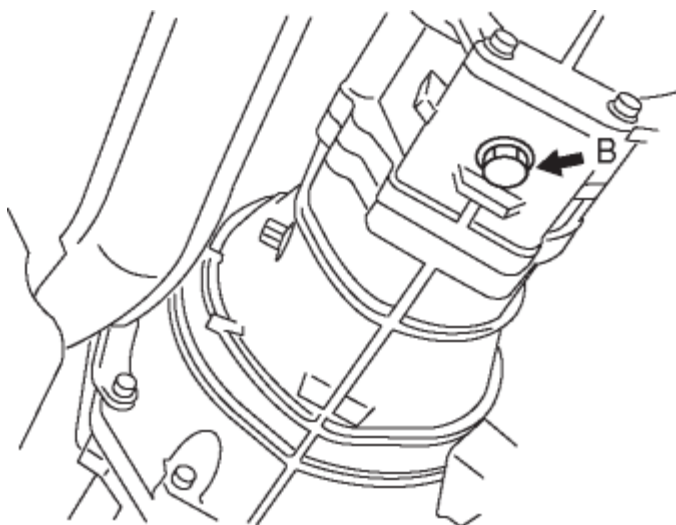
#### **Tightening torque**

- A: 25—39 N·m {2.6—3.9 kgf·m, 19—28 ft·lbf}

## 2008 - MX-5 - Transmission/Transaxle

### TRANSMISSION OIL REPLACEMENT [M15M-D]

1. Position the vehicle on level ground.
2. Remove the drain plug B with washer.

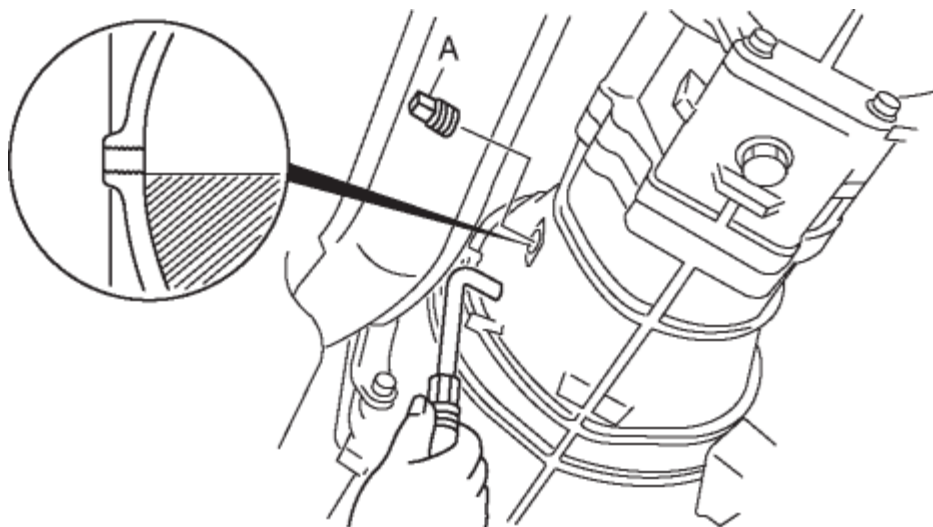


3. Drain the oil into a container.
4. Wipe the drain plug B clean and apply sealant to the drain plug B threads before installing.
5. Install the drain plug B with new washer.

#### Tightening torque

- B: 39—59 N·m { 4.0—5.9 kgf·m, 29—42 ft·lbf }

6. Remove the check plug A.



7. Add the specified oil from check plug A port until the level reaches the brim of check plug

hole.

**Specified oil grade**

- API Service GL-4 or GL-5

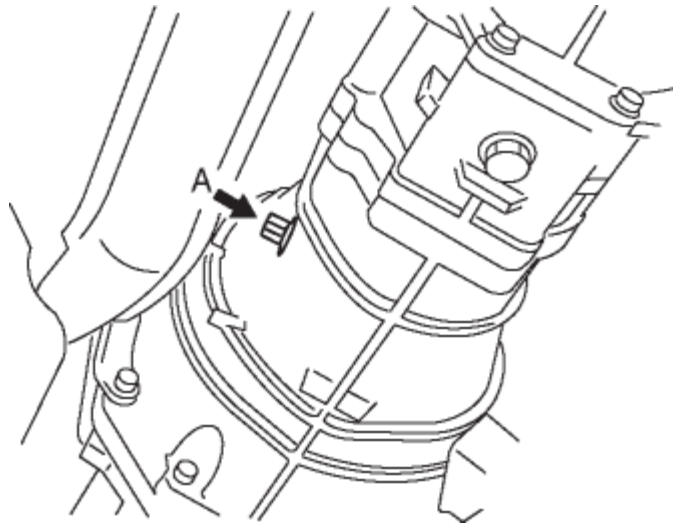
**Specified oil viscosity**

- All season: SAE 75W-90
- Above 10°C {50°F}: SAE 80W-90

**Capacity (approx. quantity)**

- 2.0 L {2.1 US qt, 1.8 Imp qt}

8. Install the new check plug A.



**Tightening torque**

- A: 25—39 N·m {2.6—3.9 kgf·m, 19—28 ft·lbf}

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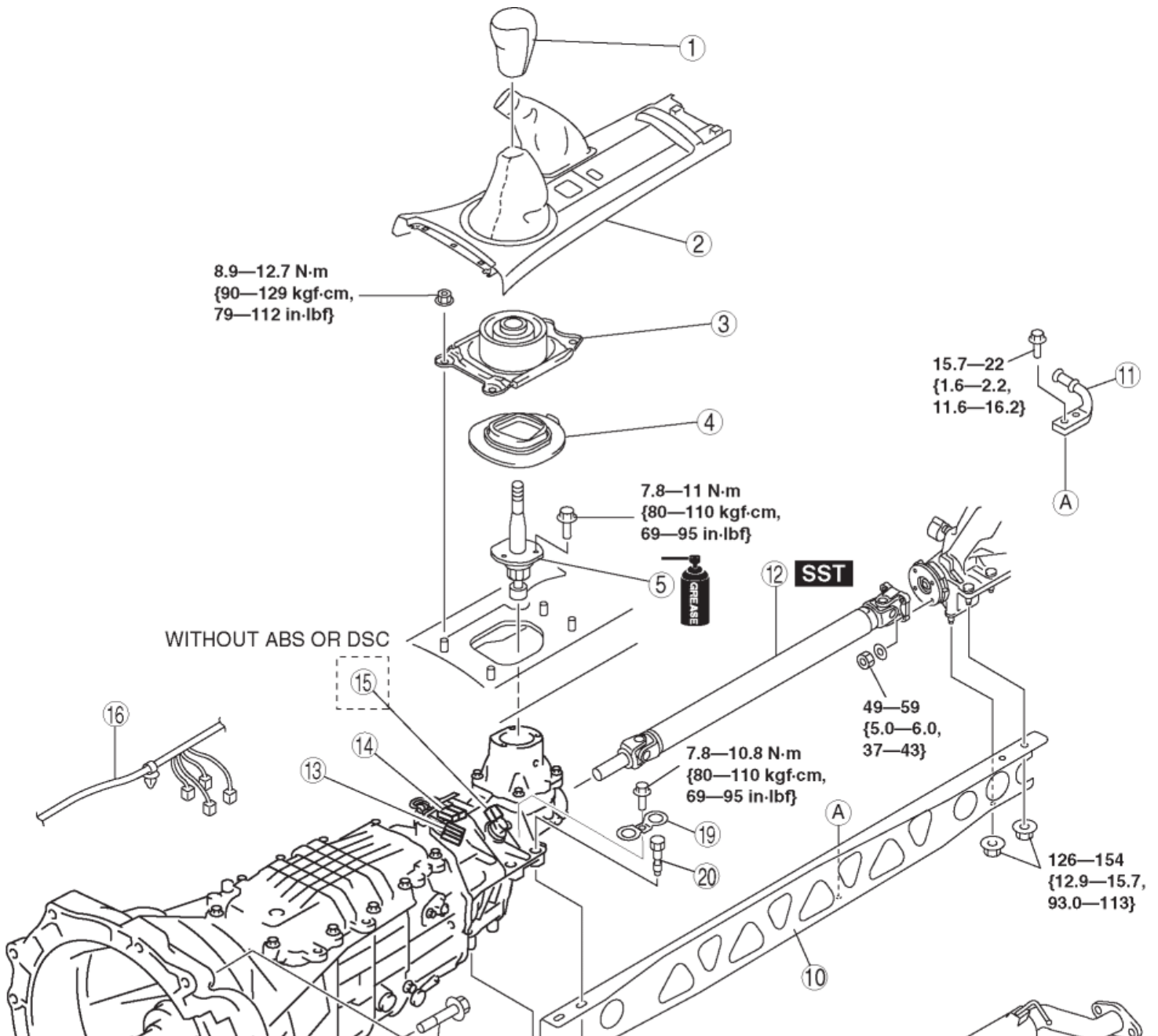
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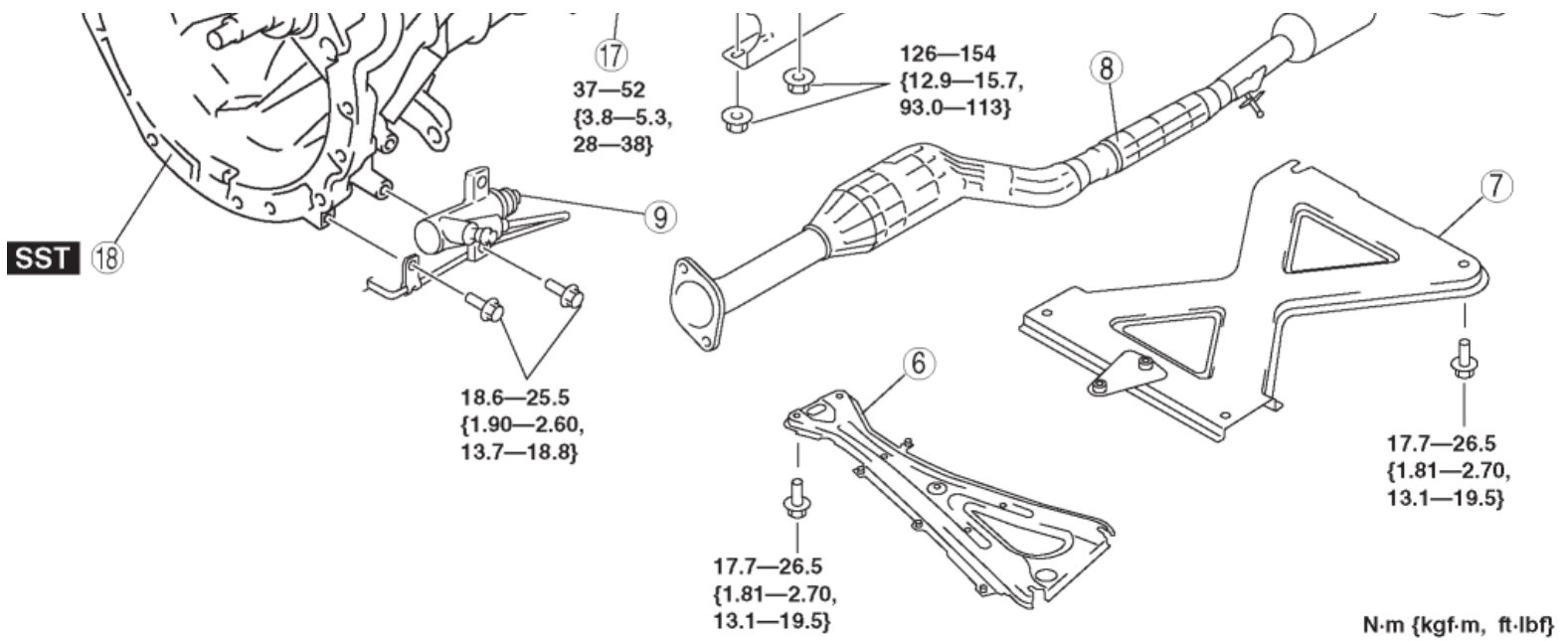
## 2008 - MX-5 - Transmission/Transaxle

### TRANSMISSION REMOVAL/INSTALLATION [P66M-D]

1. Remove the battery cover. (See [BATTERY REMOVAL/INSTALLATION\[LF\]](#).)
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION\[LF\]](#).)
3. Loosen the starter installation bolts only enough that the starter is loose, but not removed.  
(See [STARTER REMOVAL/INSTALLATION\[LF\]](#).)
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. Perform the "INSPECTION AFTER TRANSMISSION INSTALLATION", and verify that there is no malfunction.  
(See [INSPECTION AFTER TRANSMISSION INSTALLATION\[P66M-D\]](#).)







1	Shift lever knob
2	Console
3	Shift insulator component (outer)
4	Shift insulator component (inner)
5	Shift lever component (See <a href="#">Shift Lever Component Installation Note.</a> )
6	Member bracket
7	Tunnel member
8	Catalytic converter, middle pipe (See <a href="#">EXHAUST SYSTEM REMOVAL/INSTALLATION[LF].</a> )
9	Clutch release cylinder (See <a href="#">CLUTCH RELEASE CYLINDER REMOVAL/INSTALLATION.</a> )
10	Power plant frame (See <a href="#">Power Plant Frame Removal Note.</a> ) (See <a href="#">Power Plant Frame Installation Note.</a> )
11	Hanger bracket
12	Propeller shaft (See <a href="#">Propeller Shaft Removal Note.</a> ) (See <a href="#">PROPELLER SHAFT REMOVAL/INSTALLATION.</a> )
13	Back-up light switch connector

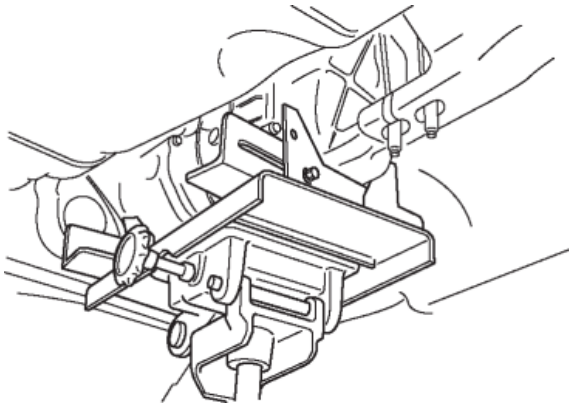
14	Neutral switch connector
15	Vehicle speed sensor connector
16	Wire
17	Transmission installation bolt
18	Transmission (See <a href="#">Transmission Removal Note.</a> ) (See <a href="#">Transmission Installation Note.</a> )
19	Stopper
20	Bolt

**CAUTION:**

- When removing/installing the transmission, be sure not to move the engine up and down more than necessary to prevent part interference with the engine.

**Power Plant Frame Removal Note**

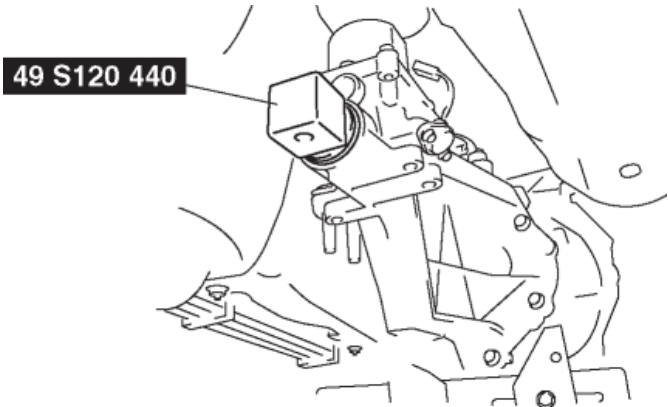
1. Support the transmission using a transmission jack.



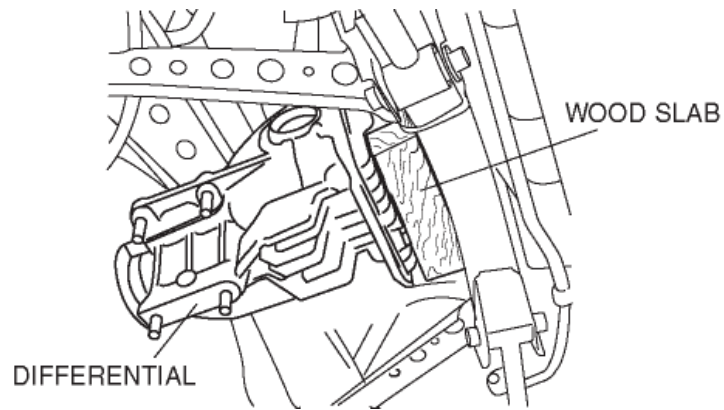
2. Remove the power plant frame.

**Propeller Shaft Removal Note**

1. Install the **SST** to the main shaft.



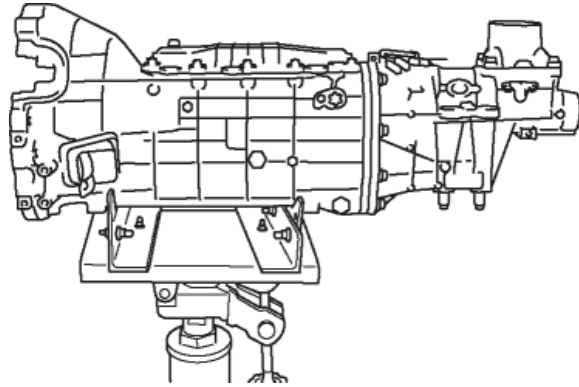
2. Insert a slab of wood behind the rear differential, and remove the propeller shaft.



### Transmission Removal Note

#### WARNING:

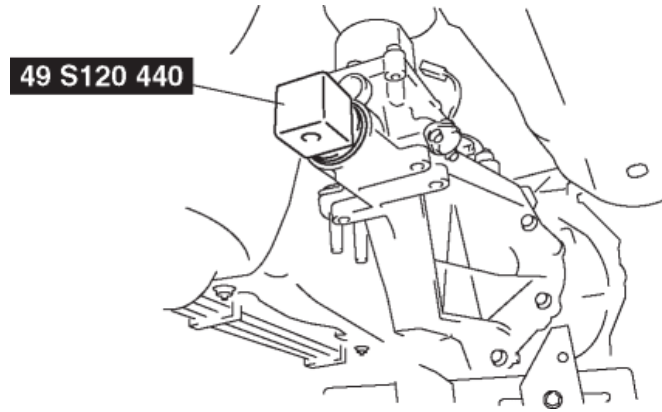
- Remove the transmission carefully, holding it steady. If the transmission falls it could be damaged or cause injury.
1. Support the transmission securely using a transmission jack.



2. Remove the transmission installation bolts.
3. Remove the transmission.

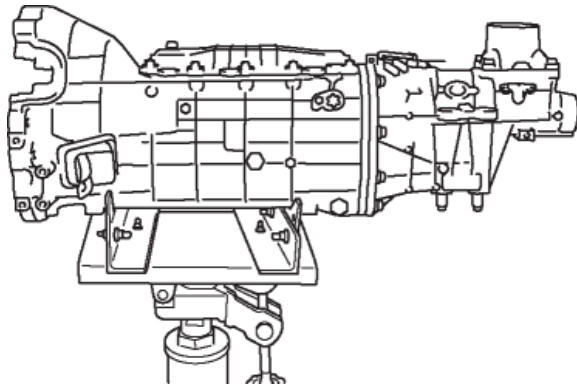
### Transmission Installation Note

1. Shift to any gear position.
2. Install the **SST** to the main shaft.



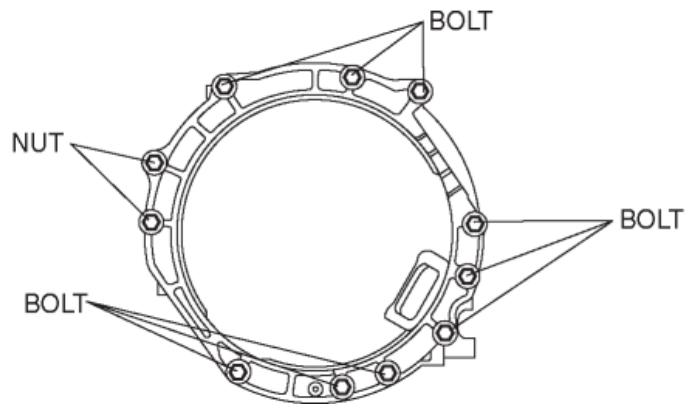
#### WARNING:

- Install the transmission carefully, holding it steady. If the transmission falls it could be damaged or cause injury.
3. Place the transmission on the transmission jack and raise it.



**NOTE:**

- Slowly rotate the **SST** to engage the clutch with the main drive gear spline, and install the transmission.
4. Install the transmission.
  5. Tighten the transmission installation bolts and nuts.

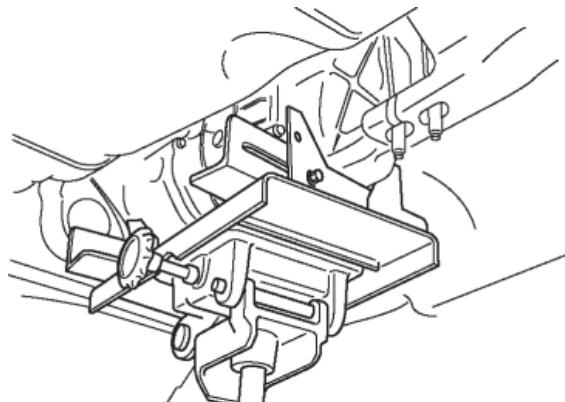


Tightening torque

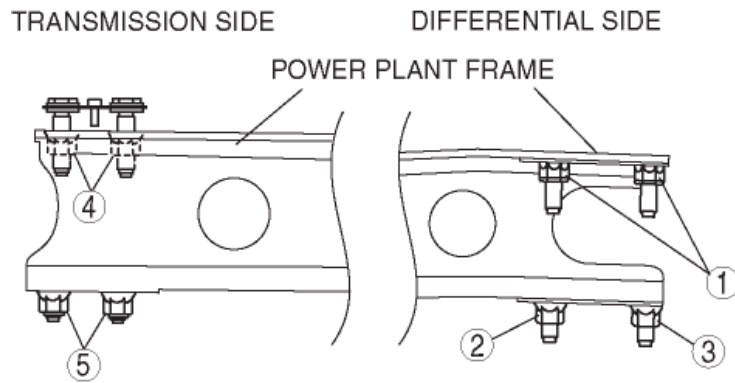
- 37—52 N·m {3.8—5.3 kgf·m, 28—38 ft·lbf}

**Power Plant Frame Installation Note**

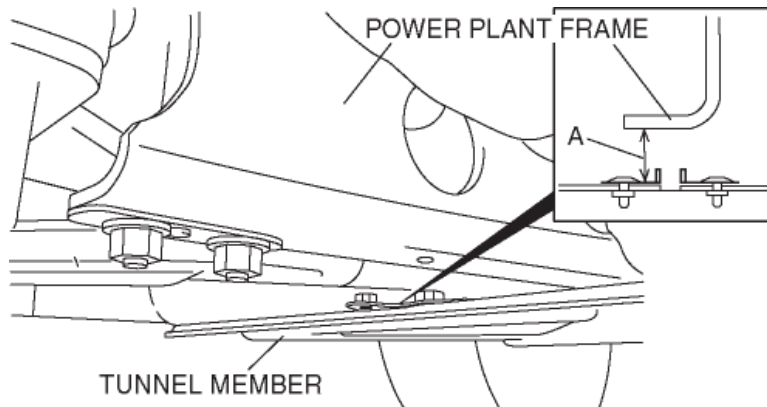
1. Support the transmission using a transmission jack.



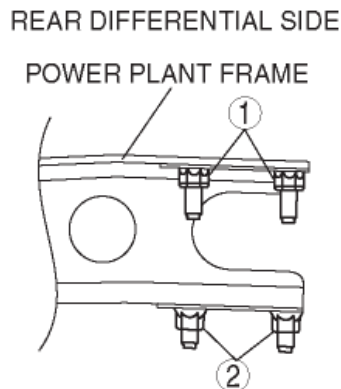
2. Install the power plant frame.
3. Temporarily tighten the nuts 1, 2, 3 in order shown in the figure.



4. Tighten nut 2 until the power plant frame is seated in the rear differential.
5. Temporarily tighten the nuts 4, 5 in order shown in the figure.
6. Install the catalytic converter, middle pipe, and tunnel member.
7. Raise the front end of the power plant frame (transmission side) or the transmission with the transmission jack, and adjust dimension A to **26.7—34.7 mm {1.06—1.36 in}** (lower surface of power plant frame-upper surface of the tunnel member) as shown in the figure.



8. Tighten the nuts on the rear differential side in the order shown in the figure.

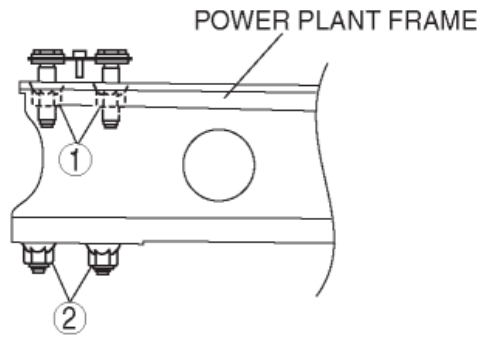


Tightening torque

- **126.0—154.0 N·m**  
**{ 12.9—15.7 kgf·m, 93.0—113 ft·lbf }**

9. Tighten the nuts on the transmission side in the order shown in the figure.

## TRANSMISSION SIDE



Tightening torque

- **126.0—154.0 N·m**  
**{ 12.9—15.7 kgf·m, 93.0—113 ft·lbf }**

10. Verify that dimension A is within the specification with the transmission jack removed.

- If it is not within the specification, adjust dimension A again.

Standard dimension A

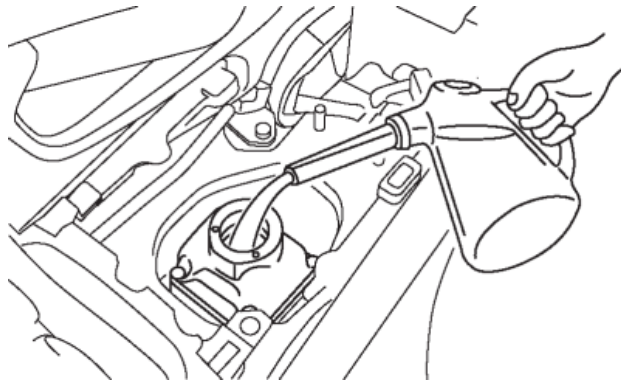
- 26.7—34.7 mm { 1.06—1.36 in }

## Shift Lever Component Installation Note

### NOTE:

- If the extension housing has been removed or the transmission has been disassembled and inspected, always add the specified type and amount of transmission oil.

1. Add the specified type and amount of oil to the shift control case.



### Shift control case specified oil grade

- API Service GL-4

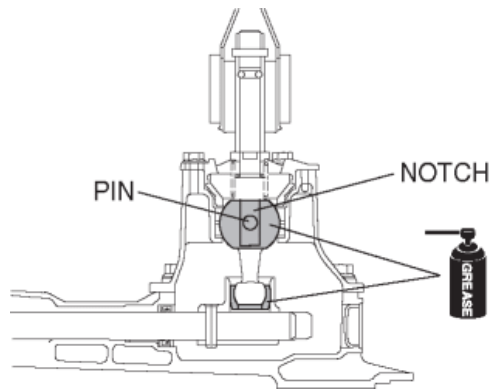
### Shift control case specified oil viscosity

- SAE 75W-90

### Shift control case capacity (approx. quantity)

- 80—230 ml { 80—230 cc, 4.88—14.03 cu in }

2. Apply grease to the areas of the shift lever component as shown in the figure.



3. Align the shift lever component notch with the shift control case pin and install the shift lever component.

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## 2008 - MX-5 - Transmission/Transaxle

### INSPECTION AFTER TRANSMISSION INSTALLATION [P66M-D]

#### NOTE:

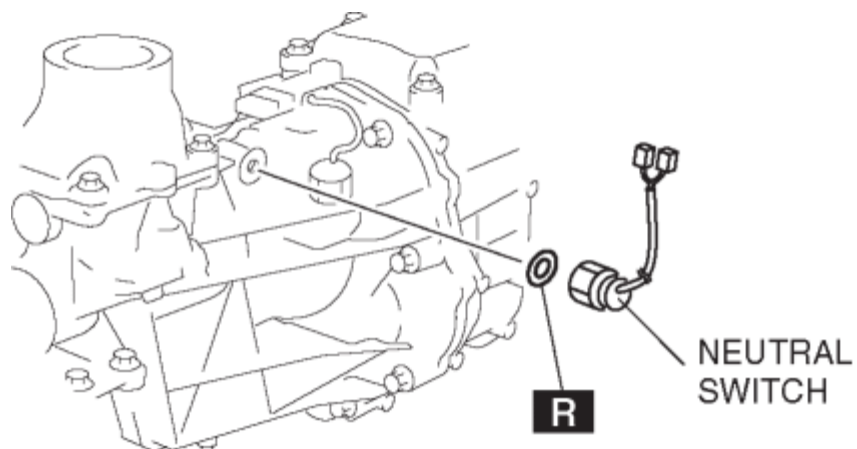
- Perform the following inspection only when the transmission has been overhauled.
1. Perform a road test and inspect the following items:
    - a. No abnormal noise in each shift position.
    - b. Smooth shift operation when shifting gears.
    - c. No gear slipout after shifting gears.
    - d. Back-up light switch operates correctly.



## 2008 - MX-5 - Transmission/Transaxle

### NEUTRAL SWITCH REMOVAL/INSTALLATION [P66M-D]

1. Remove the transmission. (See [TRANSMISSION REMOVAL/INSTALLATION\[P66M-D\]](#).)
2. Remove the neutral switch.



3. Install the neutral switch and a new packing to the transmission case.

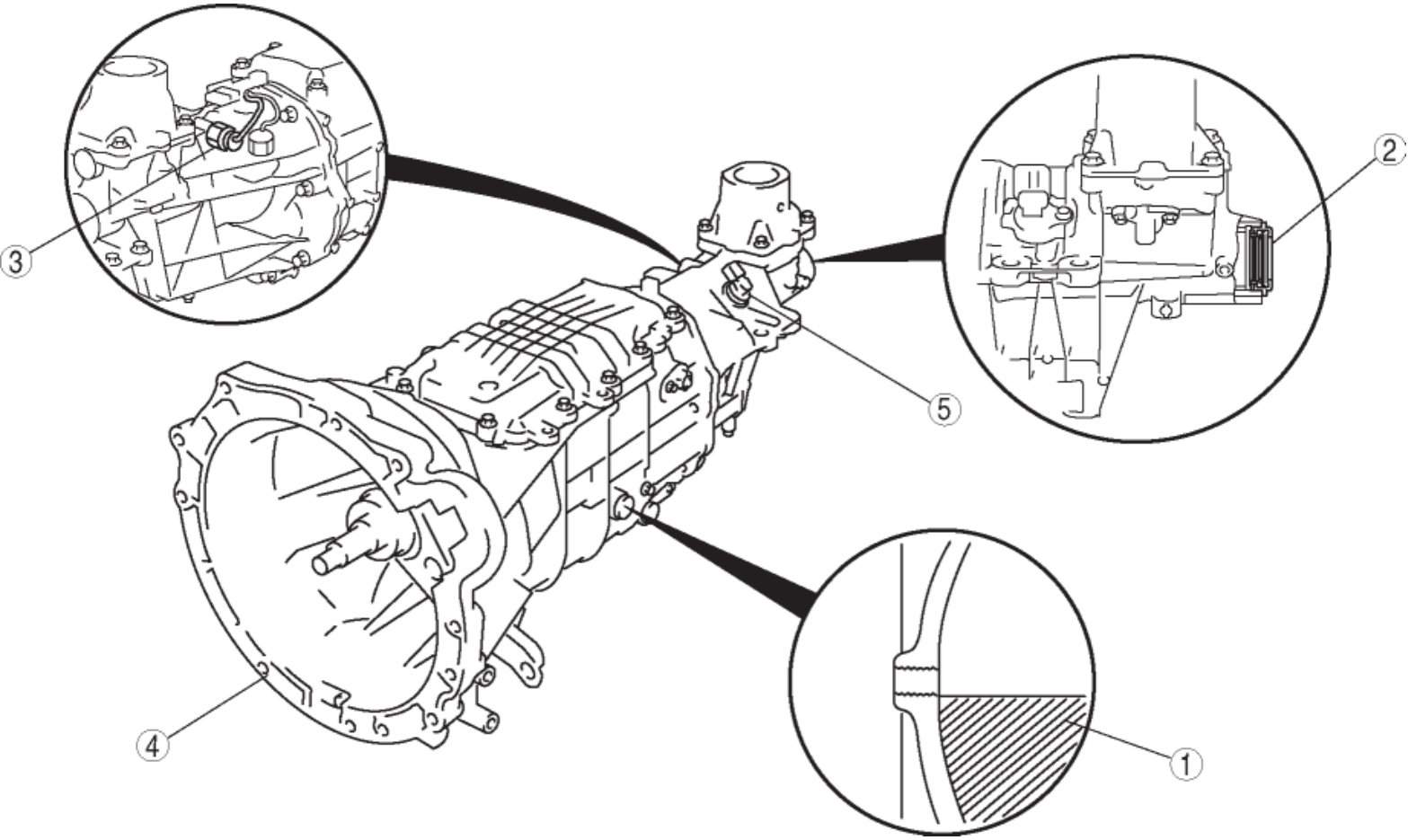
#### **Tightening torque**

- 23.6—35.3 N·m  
{ 2.5—3.5 kgf·m, 18—26 ft·lbf }

4. Install the transmission. (See [TRANSMISSION REMOVAL/INSTALLATION\[P66M-D\]](#).)

2008 - MX-5 - Transmission/Transaxle

MANUAL TRANSMISSION LOCATION INDEX [P66M-D]



1	Transmission oil (See <a href="#">TRANSMISSION OIL INSPECTION[P66M-D]</a> .) (See <a href="#">TRANSMISSION OIL REPLACEMENT[P66M-D]</a> .)
2	Oil seal (extension housing) (See <a href="#">OIL SEAL (EXTENSION HOUSING) REPLACEMENT[P66M-D]</a> .)
3	Neutral switch (See <a href="#">NEUTRAL SWITCH REMOVAL/INSTALLATION[P66M-D]</a> .)
4	Transmission (See <a href="#">TRANSMISSION REMOVAL/INSTALLATION[P66M-D]</a> .) (See <a href="#">INSPECTION AFTER TRANSMISSION INSTALLATION[P66M-D]</a> .)

5 Vehicle speed sensor (without ABS or DSC) or hole cover (with ABS or DSC)

(See [VEHICLE SPEED SENSOR \(VSS\) INSPECTION\[P66M-D\]](#).)

(See [VEHICLE SPEED SENSOR \(VSS\) REMOVAL/INSTALLATION\[P66M-D\]](#).)

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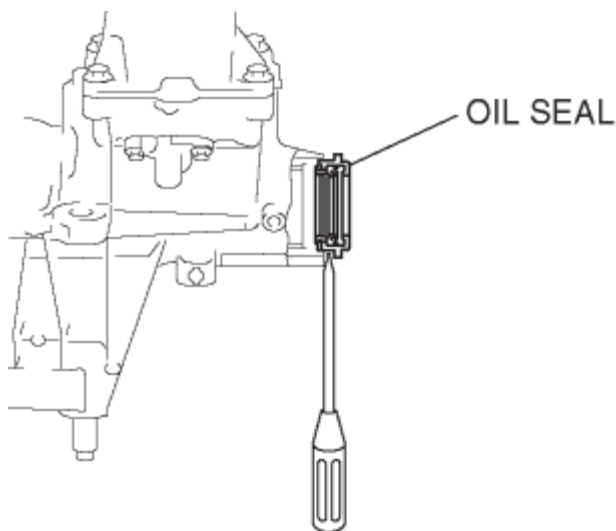
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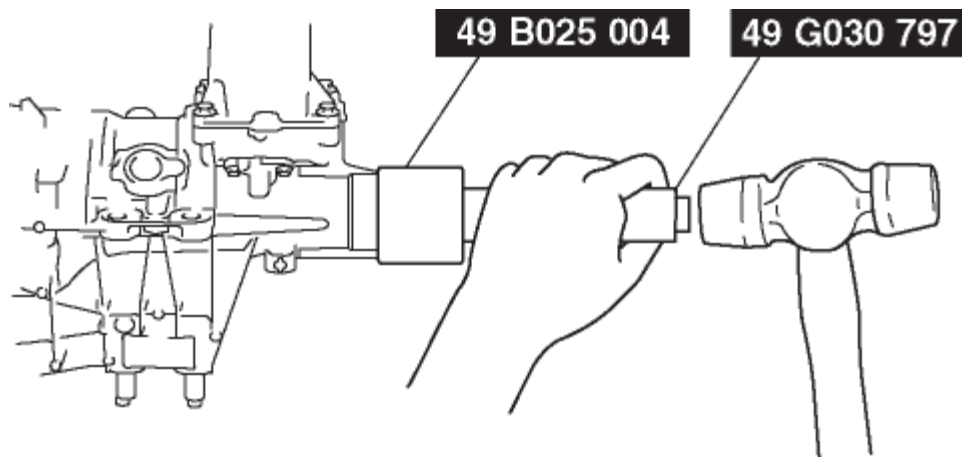
## 2008 - MX-5 - Transmission/Transaxle

### OIL SEAL (EXTENSION HOUSING) REPLACEMENT [P66M-D]

1. Position the vehicle on level ground.
2. Drain the transmission oil.  
(See [TRANSMISSION OIL REPLACEMENT\[P66M-D\]](#).)
3. Remove the following parts:
  - a. Member bracket (See [TRANSMISSION REMOVAL/INSTALLATION\[P66M-D\]](#).)
  - b. Tunnel member (See [TRANSMISSION REMOVAL/INSTALLATION\[P66M-D\]](#).)
  - c. Catalytic converter, middle pipe (See [EXHAUST SYSTEM REMOVAL/INSTALLATION\[LF\]](#).)
  - d. Propeller shaft (See [PROPELLER SHAFT REMOVAL/INSTALLATION](#).)
4. Remove the oil seal using a flathead screwdriver.



5. Tap a new oil seal into the case using the **SSTs**.



6. Apply the specified oil to the oil seal lip.

7. Install in the reverse order of removal.

8. Add transmission oil.

(See [TRANSMISSION OIL REPLACEMENT\[P66M-D\]](#).)

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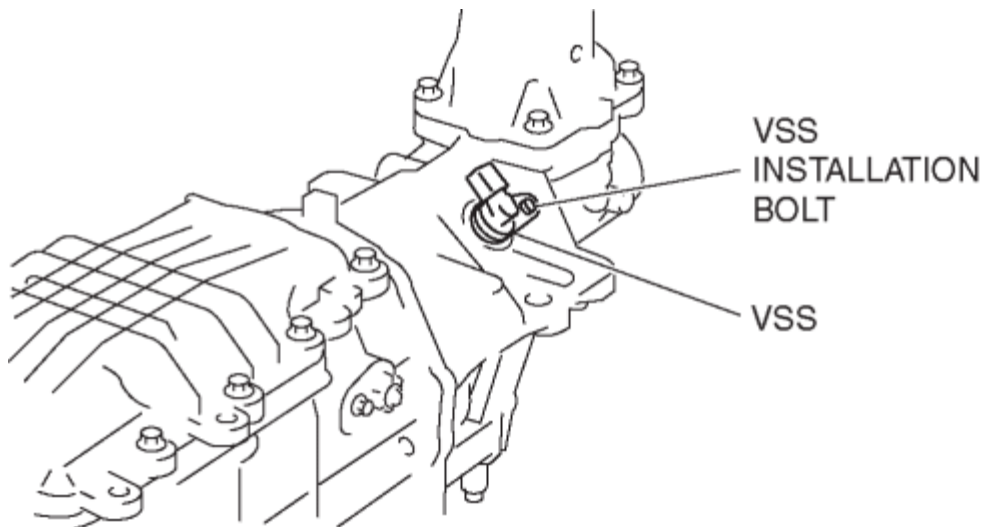
## 2008 - MX-5 - Transmission/Transaxle

### VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION [P66M-D]

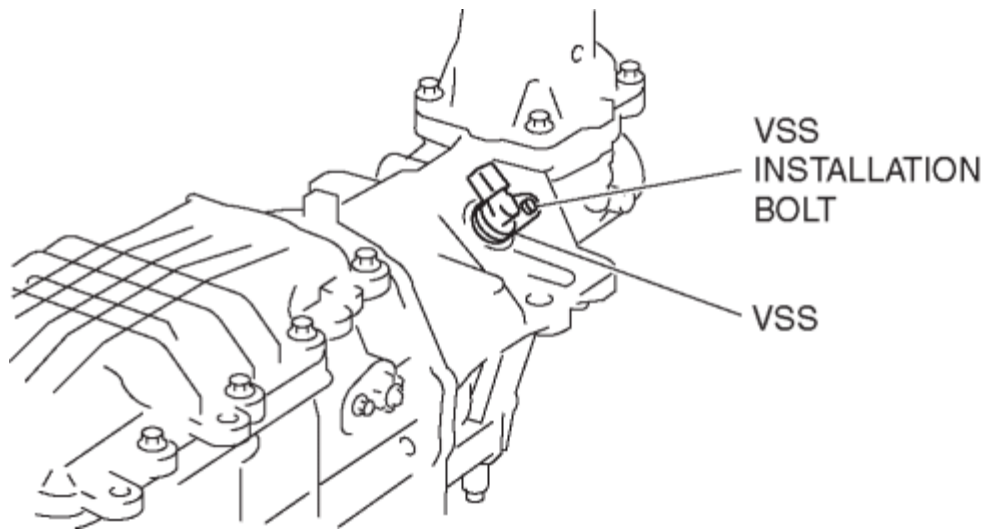
#### CAUTION:

- Water or foreign material entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign material on the connector when disconnecting it.
- If foreign materials are stuck to the VSS, disturbance by magnetic flux can cause sensor output to be abnormal and thereby negatively affect control. Make sure that foreign materials such as iron filings are not stuck to the VSS during installation.

1. Remove the battery cover. (See [BATTERY REMOVAL/INSTALLATION\[LF\]](#).)
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION\[LF\]](#).)
3. Disconnect the VSS connector.
4. Remove the transmission. (See [TRANSMISSION REMOVAL/INSTALLATION\[P66M-D\]](#).)
5. Remove the VSS.



6. Apply the specified oil to a new O ring and install it on a new VSS.
7. Install the VSS.



### **Tightening torque**

- 7.8—11 N·m {80—112 kgf·cm, 70—97 in·lbf}

8. Install the transmission. (See [TRANSMISSION REMOVAL/INSTALLATION\[P66M-D\]](#).)
9. Connect the VSS connector.
10. Connect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION\[LF\]](#).)
11. Install the battery cover. (See [BATTERY REMOVAL/INSTALLATION\[LF\]](#).)

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## 2008 - MX-5 - Transmission/Transaxle

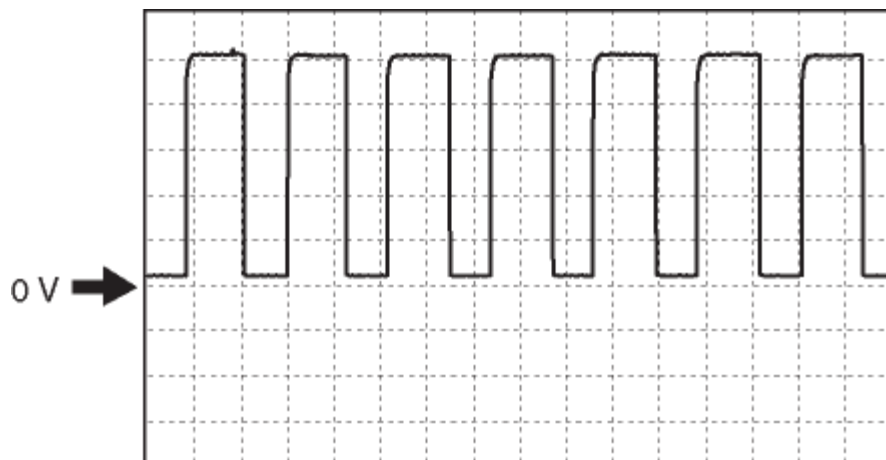
### VEHICLE SPEED SENSOR (VSS) INSPECTION [P66M-D]

#### Visual Inspection

1. Remove the VSS. (See [VEHICLE SPEED SENSOR \(VSS\) REMOVAL/INSTALLATION\[P66M-D\]](#).)
2. Verify that the sensor is free of any metallic shavings or particles.
  - If there is any malfunction, clean them off.
3. Install the VSS. (See [VEHICLE SPEED SENSOR \(VSS\) REMOVAL/INSTALLATION\[P66M-D\]](#).)

#### Wave Profile Inspection

1. Remove the PCM. (See [PCM REMOVAL/INSTALLATION\[LF\]](#).)
2. Connect M-MDS to DLC-2.
3. Connect oscilloscope test leads to the following PCM connector terminals.
  - (+) lead: PCM terminal 20
  - (-) lead: Negative battery terminal (-)
4. Start the engine.
5. Monitor VSS PID.
6. Inspect wave profile.



- Oscilloscope setting: 1 V/DIV (Y), 10 ms/DIV (X), DC range
- Vehicle condition: drive the vehicle at 10 km/h {6.2 mph}

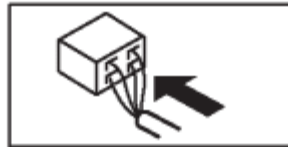
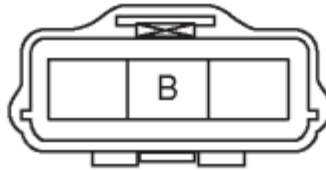


- If there is any malfunction, perform the "Open Circuit Inspection" or "Short Circuit Inspection".

## Power Supply Voltage Inspection

1. Disconnect the VSS connector.
2. Turn the ignition switch to the ON position.
3. Measure voltage at VSS terminal B.

VSS  
WIRING HARNESS-SIDE CONNECTOR



### Vehicle speed sensor (VSS) voltage

- 4.5—5.5 V
- If voltage is normal, go to Open Circuit Inspection and Short Circuit Inspection.
- If there is any malfunction, repair wiring harness between VSS and PCM.

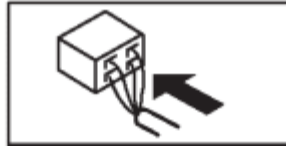
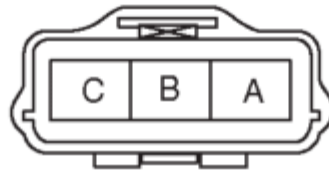
## Open Circuit Inspection

1. Inspect the following circuit for open.
  - Power circuit (VSS terminal A to main relay terminal D)
  - Ground circuit (VSS terminal C to GND)
  - If an open circuit or short circuit is found, repair the malfunctioning wiring harness.
  - If there are no open or short circuits, perform the sensor rotor inspection.

## Short Circuit Inspection

1. Inspect the following circuit for short circuit.

VSS  
WIRING HARNESS-SIDE CONNECTOR



- Power circuit (VSS terminal A to main relay terminal D)
- If an open circuit or short circuit is found, repair the malfunctioning wiring harness.
- If there are no open or short circuits, perform the sensor rotor inspection.

### Sensor Rotor Inspection

1. Remove the VSS. (See [VEHICLE SPEED SENSOR \(VSS\) REMOVAL/INSTALLATION\[P66M-D\]](#).)
2. Shift the shift lever to neutral position.
3. Inspect sensor rotor surface via VSS installation hole while rotating a rear tire manually.
  - a. Is the sensor rotor free of damage and cracks?
  - b. Is the sensor rotor free of any metallic shavings or particles?
    - If the sensor rotor is normal, replace the VSS.
    - If there is any malfunction, clean or replace the sensor rotor.

[< Previous](#)   [Next >](#)

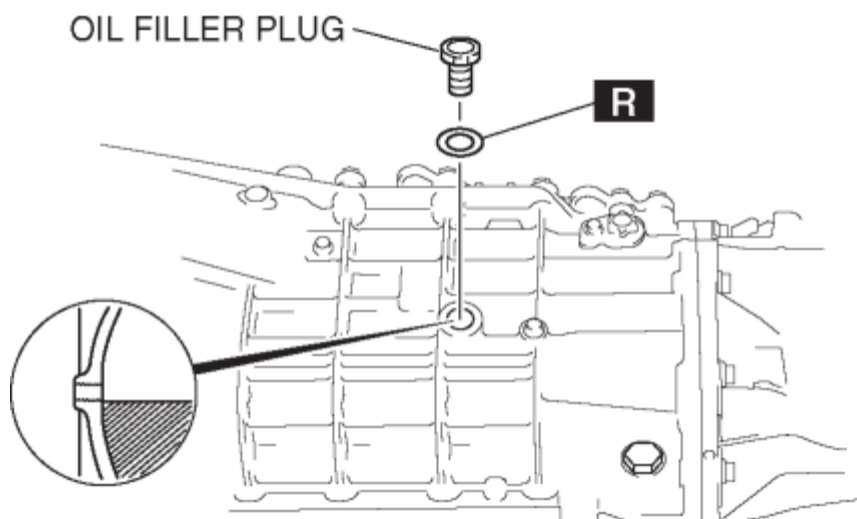
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## 2008 - MX-5 - Transmission/Transaxle

### TRANSMISSION OIL INSPECTION [P66M-D]

1. Position the vehicle on level ground.
2. Remove oil filler plug.



3. Verify that the oil is near the brim of the plug port.
  - If the oil is not near the brim of the plug port, add the specified amount and type of oil.

#### **Transmission case specified oil grade**

- API Service GL-4

#### **Transmission case specified oil viscosity**

- SAE 75W-90

4. Install oil filler plug and a new washer.

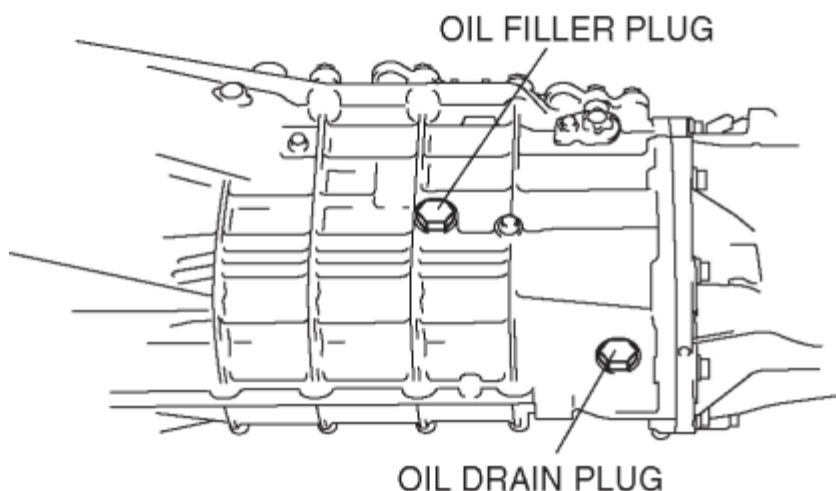
#### **Tightening torque**

- 40—59 N·m { 4.1—6.0 kgf·m, 30—43 ft·lbf }

## 2008 - MX-5 - Transmission/Transaxle

### TRANSMISSION OIL REPLACEMENT [P66M-D]

1. Position the vehicle on level ground.
2. Remove oil filler plug and drain plug, and then drain the oil.

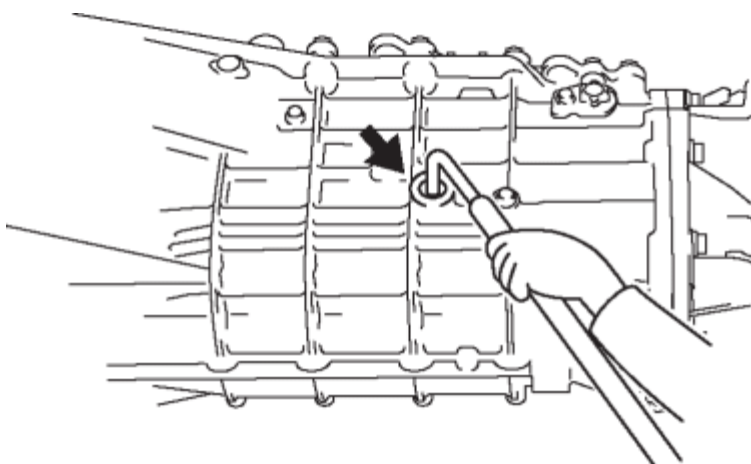


3. Clean drain plug.
4. Install drain plug and a new washer.

#### **Tightening torque**

- 40—59 N·m { 4.1—6.0 kgf·m, 30—43 ft·lbf }

5. Add the specified amount and type of oil through the plug port for oil filler plug to near the brim of the port.



#### **Transmission case specified oil grade**

- API Service GL-4

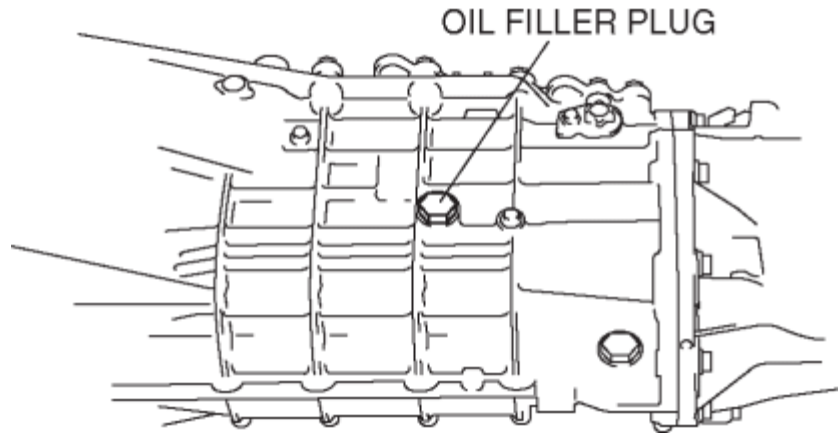
### **Transmission case specified oil viscosity**

- SAE 75W-90

### **Transmission case capacity (approx. quantity)**

- 2.1 L { 2.2 US qt, 1.8 Imp qt }

6. Install oil filler plug and a new washer.



### **Tightening torque**

- 40—59 N·m { 4.1—6.0 kgf·m, 30—43 ft·lbf }

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## 2008 - MX-5 - Transmission/Transaxle

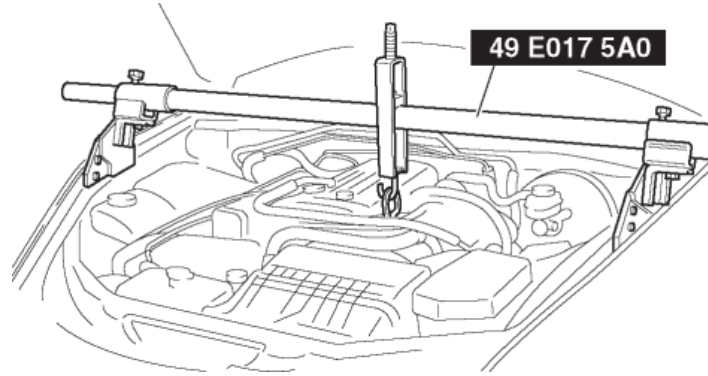
### OIL COOLER REMOVAL/INSTALLATION [SJ6A-EL]

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Drain the ATF. (See [AUTOMATIC TRANSMISSION FLUID \(ATF\) REPLACEMENT \[SJ6A-EL\].](#))
4. Drain the engine coolant. (See [ENGINE COOLANT REPLACEMENT \[LF\].](#))
5. Remove the following parts.
  - a. Splash shield
  - b. Under cover
  - c. Mudguard
  - d. Battery, battery tray, battery duct (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
  - e. Air cleaner (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\].](#))
  - f. PCM and air cleaner insulator (See [PCM REMOVAL/INSTALLATION \[LF\].](#))
  - g. Coolant reserve tank (See [COOLANT RESERVE TANK REMOVAL/INSTALLATION \[LF\].](#))
  - h. Tunnel member component
  - i. Transverse member
  - j. Exhaust manifold bracket
  - k. Middle pipe (See [EXHAUST SYSTEM REMOVAL/INSTALLATION \[LF\].](#))
6. Remove in the order indicated in the table.
7. Install in the reverse order of removal.
8. Add the engine coolant. (See [ENGINE COOLANT REPLACEMENT \[LF\].](#))
9. Add ATF to the specified level. (See [AUTOMATIC TRANSMISSION FLUID \(ATF\) REPLACEMENT \[SJ6A-EL\].](#))
10. Inspect for oil leakage from the oil pipes and oil hoses.
11. Inspect for coolant from the hoses.
12. Inspect for engine coolant leakage.(See [ENGINE COOLANT LEAKAGE INSPECTION \[LF\].](#))
13. Inspect the ATF level and condition. (See [AUTOMATIC TRANSMISSION FLUID \(ATF\) INSPECTION \[SJ6A-EL\].](#))



### Engine Mount Removal Note

1. Support the engine using the SST.



2. Remove the engine mount.

### Radiator (In Tank Oil Cooler) Installation Note

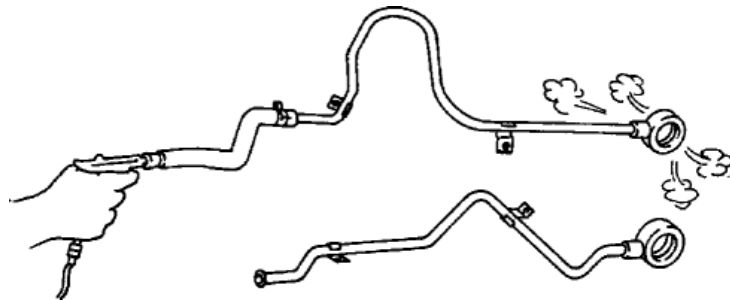
1. The automatic transmission oil cooler flushing must be performed whenever a transmission is removed for service because the existing fluid may be contaminated, and to prevent contamination of new fluid.

#### NOTE:

- Flushing must be performed after installation of the overhauled or replaced transmission.
2. Follow the instructions in the manufacturer's publication for flushing operation.

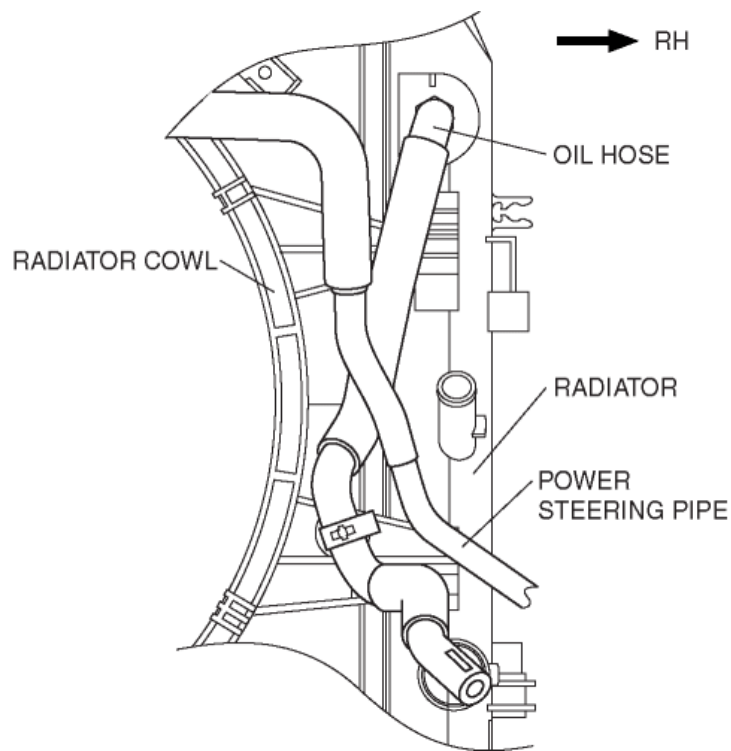
### Oil Pipe, Hose clamp, Oil hose Installation Note

1. Apply compressed air to cooler side opening, and blow any remaining grime and foreign material from the cooler pipes. Compressed air should be applied for **more than 1 min.**

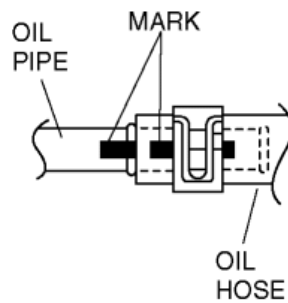


2. Be sure to install the oil hose between the power steering pipe and the radiator cowl as shown in the figure.





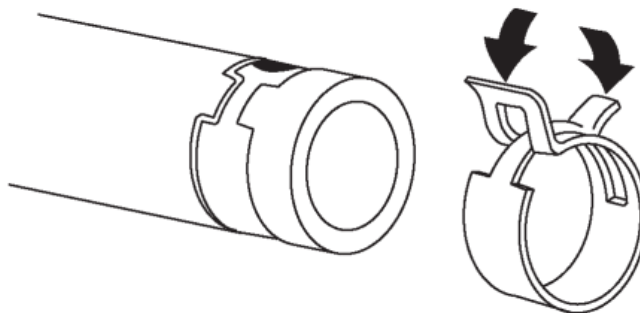
3. Align the marks, and slide the oil hose onto the oil pipe until it is fully seated as shown.



4. Install the hose clamp onto the hose.

**NOTE:**

- If reusing the hose, install the new hose clamp exactly on the mark left by the previous hose clamp. Then apply force to the hose clamp in the direction of the arrow in order to fit the clamp in place.



5. Verify that the hose clamp does not interfere with any other components.

## 2008 - MX-5 - Transmission/Transaxle

### ROAD TEST [SJ6A-EL]

#### WARNING:

- When performing a road test, be aware of other vehicles, people, impediments to avoid an accident.

#### NOTE:

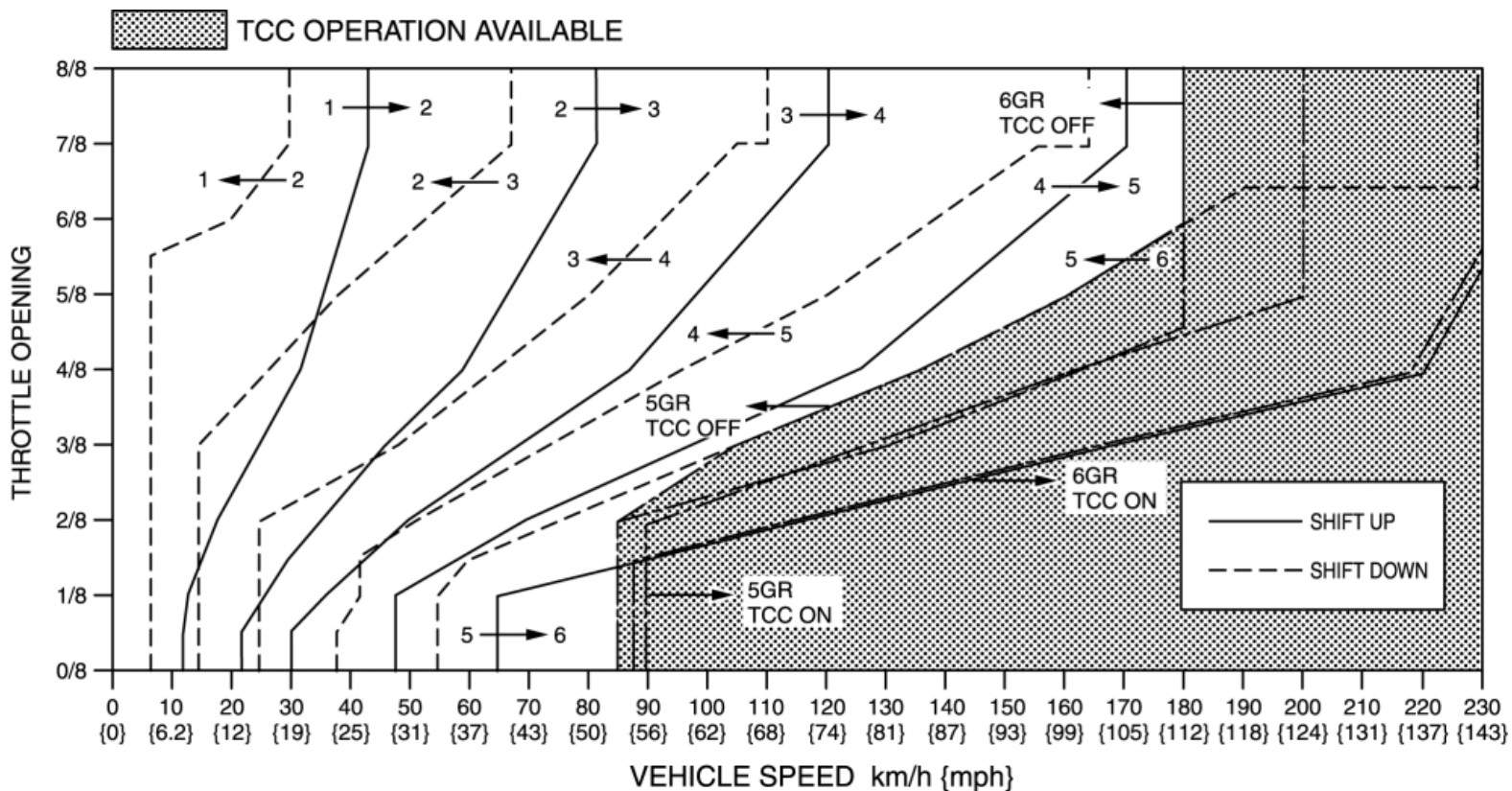
- When the legal speed limit must be exceeded, use a chassis dynamometer instead of performing a road test.

#### Road Test Preparation

- Inspect the engine coolant level. (See [ENGINE COOLANT LEVEL INSPECTION \[LF\].](#))
- Inspect the engine oil level. (See [ENGINE OIL LEVEL INSPECTION \[LF\].](#))
- Inspect the ATF level. (See [AUTOMATIC TRANSMISSION FLUID \(ATF\) LEVEL ADJUSTMENT \[SJ6A-EL\].](#))
- Inspect the idle speed. (See [ENGINE TUNE-UP\[LF\].](#))
- Inspect the ignition timing. (See [ENGINE TUNE-UP\[LF\].](#))
- Wait until the engine and transmission reach normal operating temperature.

#### Shift Diagram

##### D range (normal mode)



D Range Test

1. Perform road test preparation. (See [Road Test Preparation](#).)
2. Shift the selector lever to the D range.
3. Accelerate with the throttle half and then wide open.
4. Verify that 1→2, 2→3, 3→4, 4→5, and 5→6 upshifts can be obtained. The shift points must be as shown in the table below.

If there is any malfunction, inspect the TCM and AT. (See [SYMPTOM TROUBLESHOOTING ITEM TABLE \[SJ6A-EL\]](#).)
5. Drive the vehicle in 6GR, 5GR, 4GR, 3GR, 2GR and verify that kickdown occurs for 6→5, 5→4, 4→3, 3→2, and 2→1 downshifts, and that the shift points are as shown in the table below.

If there is any malfunction, inspect the TCM and AT. (See [SYMPTOM TROUBLESHOOTING ITEM TABLE \[SJ6A-EL\]](#).)
6. Decelerate the vehicle and verify that engine braking effect is felt in 4GR, 5GR, and 6GR.

If there is any malfunction, inspect the TCM and AT. (See [SYMPTOM TROUBLESHOOTING ITEM TABLE \[SJ6A-EL\]](#).)
7. Drive the vehicle and verify that TCC operation is obtained. The operation points must be as shown in the table below.

If there is any malfunction, inspect the TCM and AT. (See [SYMPTOM TROUBLESHOOTING ITEM TABLE \[SJ6A-EL\]](#).)

Shift point table

Range	Mode	Throttle condition	Shift	Vehicle speed (km/h {mph})	Turbine speed (rpm)
	NORMAL	Wide open throttle	D <sub>1</sub> →D <sub>2</sub>	42—48 {27—29}	5,450—6,150
			D <sub>2</sub> →D <sub>3</sub>	79—87 {49—53}	5,950—6,500
			D <sub>3</sub> →D <sub>4</sub>	117—127 {73—78}	6,000—6,450
			D <sub>4</sub> →D <sub>5</sub>	165—175 {103—108}	6,050—6,350
			TCC ON (D <sub>5</sub> )	195—205 {121—127}	5,100—5,300
			D <sub>5</sub> →D <sub>6</sub>	229—239 {142—148}	4,850—5,050
			TCC ON (D <sub>6</sub> )	227—237 {141—146}	4,850—5,000
		Half throttle	D <sub>1</sub> →D <sub>2</sub>	27—34 {17—21}	3,400—4,450
			D <sub>2</sub> →D <sub>3</sub>	48—64 {30—39}	3,600—4,800
			D <sub>3</sub> →D <sub>4</sub>	71—96 {45—59}	3,650—4,900
			D <sub>4</sub> →D <sub>5</sub>	118—129 {74—79}	4,300—4,650
			TCC ON (D <sub>5</sub> )	149—176 {93—109}	3,850—4,550
			D <sub>5</sub> →D <sub>6</sub>	206—222 {128—137}	5,350—5,750
			TCC ON (D <sub>6</sub> )	204—220 {127—136}	4,350—4,650

D		Closed throttle position	D <sub>6</sub> →D <sub>5</sub>	52—58 {33—35}	1,150—1,200
			D <sub>5</sub> →D <sub>4</sub>	35—41 {22—25}	950—1,050
			D <sub>4</sub> →D <sub>3</sub>	22—28 {14—17}	850—1,000
			D <sub>3</sub> →D <sub>2</sub>	12—18 {8—11}	650—900
			D <sub>2</sub> →D <sub>1</sub>	4—10 {3—6}	300—700
		Kickdown	D <sub>6</sub> →D <sub>5</sub>	224—234 {139—145}	4,750—4,950
			D <sub>5</sub> →D <sub>4</sub>	159—169 {99—104}	4,150—4,350
			D <sub>4</sub> →D <sub>3</sub>	105—115 {66—71}	3,850—4,150
			D <sub>3</sub> →D <sub>2</sub>	63—71 {40—44}	3,250—3,600
			D <sub>2</sub> →D <sub>1</sub>	27—33 {17—20}	2,050—2,450
	POWER	Wide open throttle	D <sub>1</sub> →D <sub>2</sub>	42—48 {27—29}	5,450—6,150
			D <sub>2</sub> →D <sub>3</sub>	79—87 {49—53}	5,950—6,500
			D <sub>3</sub> →D <sub>4</sub>	117—127 {73—78}	6,000—6,450
			D <sub>4</sub> →D <sub>5</sub>	165—175 {103—108}	6,050—6,350
			D <sub>5</sub> →D <sub>6</sub>	229—239 {142—148}	5,950—6,150
		Half throttle	D <sub>1</sub> →D <sub>2</sub>	30—38 {19—23}	3,900—4,850
			D <sub>2</sub> →D <sub>3</sub>	50—66 {31—40}	3,750—4,900
			D <sub>3</sub> →D <sub>4</sub>	77—100 {48—62}	3,900—5,150
			D <sub>4</sub> →D <sub>5</sub>	126—138 {79—85}	4,600—5,000
			D <sub>5</sub> →D <sub>6</sub>	206—222 {128—137}	5,350—5,750
		Closed throttle position	D <sub>6</sub> →D <sub>5</sub>	82—88 {51—54}	1,750—1,850
			D <sub>5</sub> →D <sub>4</sub>	57—63 {36—39}	1,500—1,600
			D <sub>4</sub> →D <sub>3</sub>	27—33 {17—20}	1,000—1,200
			D <sub>3</sub> →D <sub>2</sub>	12—18 {8—11}	650—900
			D <sub>2</sub> →D <sub>1</sub>	4—10 {3—6}	300—700
			D <sub>6</sub> →D <sub>5</sub>	224—234 {139—145}	4,750—4,950
			D <sub>5</sub> →D <sub>4</sub>	159—169 {99—104}	4,150—4,350

		Kickdown	D <sub>4</sub> →D <sub>3</sub>	105—115 {66—71}	3,850—4,150
			D <sub>3</sub> →D <sub>2</sub>	63—71 {40—44}	3,250—3,600
			D <sub>2</sub> →D <sub>1</sub>	27—33 {17—20}	2,050—2,450

## M Range Test

1. Perform road test preparation. (See [Road Test Preparation](#).)
2. Shift the selector lever to M range.
3. Verify that 1→2, 2→3, 3→4, 4→5, and 5→6 upshifts and 6→5, 5→4, 4→3, 3→2, and 2→1 downshifts are obtained by manual shifting.
  - If there is any malfunction, inspect the TCM and AT. (See [SYMPTOM TROUBLESHOOTING ITEM TABLE \[SJ6A-ELJ\]](#).)
4. Decelerate the vehicle and verify that 6→5, 5→4, 4→3, 3→2, and 2→1 downshifts are obtained. The shift points must be as shown in the table below.
  - If there is any malfunction, inspect the TCM and AT. (See [SYMPTOM TROUBLESHOOTING ITEM TABLE \[SJ6A-ELJ\]](#).)
5. Decelerate the vehicle and verify that engine braking effect is felt in 1GR, 2GR, 3GR, 4GR, 5GR, and 6GR.
  - If there is any malfunction, inspect the TCM and AT. (See [SYMPTOM TROUBLESHOOTING ITEM TABLE \[SJ6A-ELJ\]](#).)
6. Drive the vehicle and verify that TCC operation is obtained in 5GR and 6GR. The operation points must be as shown in the table below.
  - If there is any malfunction, inspect the TCM and AT. (See [SYMPTOM TROUBLESHOOTING ITEM TABLE \[SJ6A-ELJ\]](#).)
7. Drive the vehicle in 6GR, 5GR, 4GR, and 3GR and verify that kickdown occurs for 6→5, 5→4, 4→3 and 3→2 downshifts, and that the shift points are as shown in the table below.
  - If there is any malfunction, inspect the TCM and AT. (See [SYMPTOM TROUBLESHOOTING ITEM TABLE \[SJ6A-ELJ\]](#).)

## Vehicle speed at shift point table

Range	Mode	Throttle condition	Shift	Vehicle speed km/h {mph}	Turbine speed (rpm)
M	Normal	Half throttle	TCC ON (D <sub>5</sub> )	150—177 {93—109}	3,900—4,600
			TCC ON (D <sub>6</sub> )	204—220 {127—136}	4,350—4,650
		All round	D <sub>6</sub> →D <sub>5</sub>	44—50 {28—31}	950—1,050
			D <sub>5</sub> →D <sub>4</sub>	35—41 {22—25}	950—1,050
			D <sub>4</sub> →D <sub>3</sub>	17—23 {11—14}	650—800
			D <sub>3</sub> →D <sub>2</sub>	12—18 {8—11}	650—900
			D <sub>2</sub> →D <sub>1</sub>	9—15 {6—9}	700—1,100
			D <sub>6</sub> →D <sub>5</sub>	185—195 {115—120}	3,950—4,100

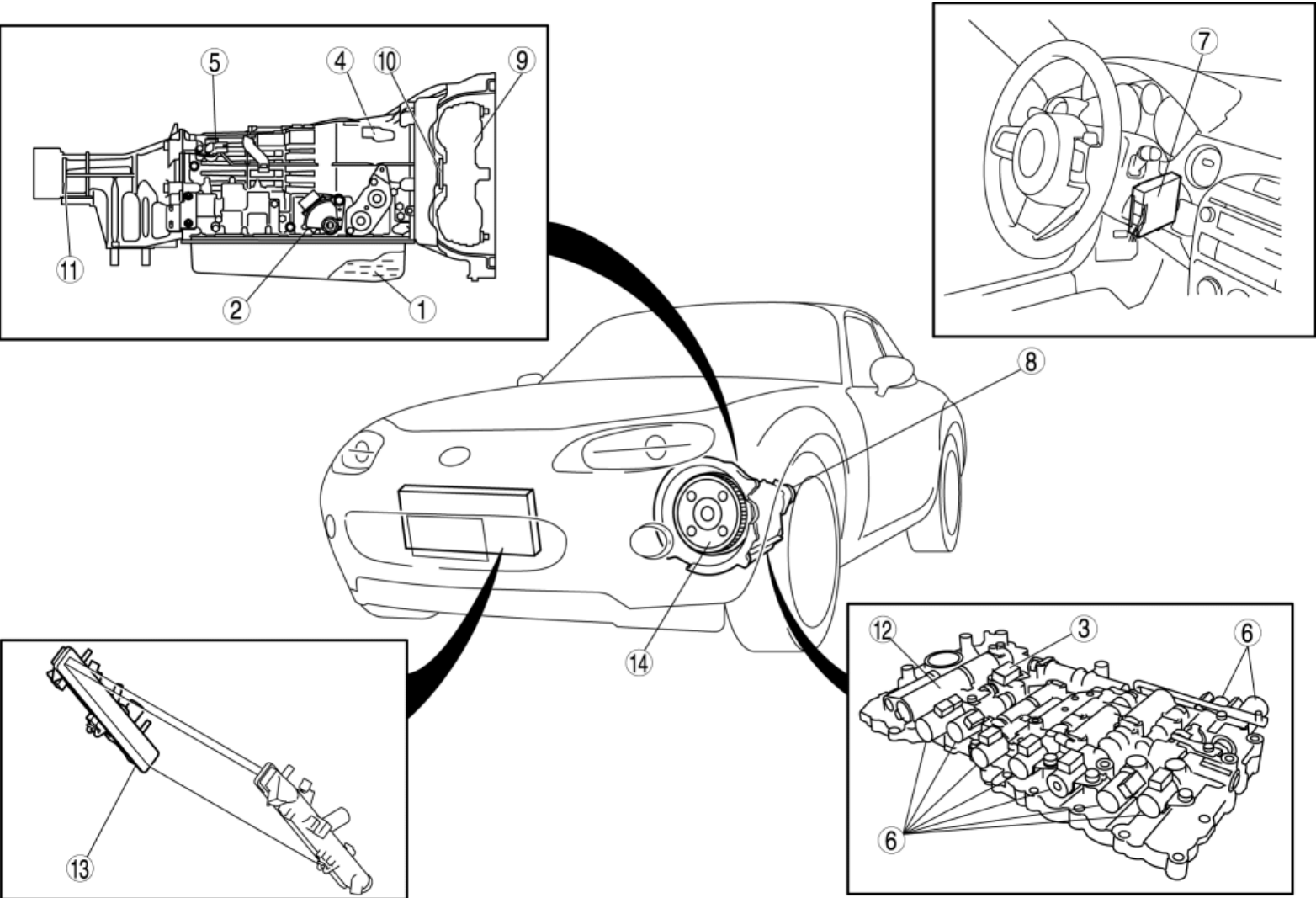
		Kickdown	D <sub>5</sub> →D <sub>4</sub>	120—130 { 75—80 }	3,150—3,350
			D <sub>4</sub> →D <sub>3</sub>	73—83 { 46—51 }	2,700—3,000
			D <sub>3</sub> →D <sub>2</sub>	46—54 { 29—33 }	2,400—2,750

**P Position Test**

1. Shift into the P position on a gentle slope. Release the brake, and verify that the vehicle does not roll.
- If there is any malfunction, inspect the AT. (See [SYMPTOM TROUBLESHOOTING ITEM TABLE \[SJ6A-EL\]](#).)

2008 - MX-5 - Transmission/Transaxle

AUTOMATIC TRANSMISSION LOCATION INDEX [SJ6A-EL]



1	Automatic transmission fluid (See <a href="#">AUTOMATIC TRANSMISSION FLUID (ATF) INSPECTION [SJ6A-EL].</a> ) (See <a href="#">AUTOMATIC TRANSMISSION FLUID (ATF) REPLACEMENT [SJ6A-EL].</a> ) (See <a href="#">AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT [SJ6A-EL].</a> )
2	Transmission range (TR) switch (See <a href="#">TRANSMISSION RANGE (TR) SWITCH INSPECTION [SJ6A-EL].</a> ) (See <a href="#">TRANSMISSION RANGE (TR) SWITCH REMOVAL/INSTALLATION [SJ6A-EL].</a> ) (See <a href="#">TRANSMISSION RANGE (TR) SWITCH ADJUSTMENT [SJ6A-EL].</a> )
3	Transmission fluid temperature (TFT) sensor (See <a href="#">TRANSMISSION FLUID TEMPERATURE (TFT) SENSOR INSPECTION [SJ6A-EL].</a> ) (See <a href="#">TRANSMISSION FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION [SJ6A-EL].</a> )

4	Turbine sensor  (See <a href="#">TURBINE SENSOR INSPECTION [SJ6A-EL].</a> )  (See <a href="#">TURBINE SENSOR REMOVAL/INSTALLATION [SJ6A-EL].</a> )
5	Vehicle speed sensor (VSS)  (See <a href="#">VEHICLE SPEED SENSOR (VSS) INSPECTION [SJ6A-EL].</a> )  (See <a href="#">VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION [SJ6A-EL].</a> )
6	Solenoid valve  (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL].</a> )
7	TCM  (See <a href="#">TCM INSPECTION [SJ6A-EL].</a> )  (See <a href="#">TCM REMOVAL/INSTALLATION [SJ6A-EL].</a> )
8	Automatic transmission  (See <a href="#">AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL].</a> )
9	Torque converter  (See <a href="#">TORQUE CONVERTER REMOVAL/INSTALLATION [SJ6A-EL].</a> )
10	Oil seal (oil pump)  (See <a href="#">OIL SEAL (OIL PUMP) REPLACEMENT [SJ6A-EL].</a> )
11	Oil seal (extension housing)  (See <a href="#">OIL SEAL (EXTENSION HOUSING) REPLACEMENT [SJ6A-EL].</a> )
12	Control valve body  (See <a href="#">CONTROL VALVE BODY REMOVAL [SJ6A-EL].</a> )  (See <a href="#">CONTROL VALVE BODY INSTALLATION [SJ6A-EL].</a> )
13	Oil cooler  (See <a href="#">OIL COOLER FLUSHING [SJ6A-EL].</a> )  (See <a href="#">OIL COOLER REMOVAL/INSTALLATION [SJ6A-EL].</a> )  (See <a href="#">OIL COOLER DISASSEMBLY/ASSEMBLY [SJ6A-EL].</a> )
14	Drive plate  (See <a href="#">DRIVE PLATE REMOVAL/INSTALLATION [SJ6A-EL].</a> )



## 2008 - MX-5 - Transmission/Transaxle

### MECHANICAL SYSTEM TEST [SJ6A-EL]

#### Mechanical System Test Preparation

1. Engage the parking brake and use wheel chocks at the front and rear of the wheels.
2. Inspect the engine coolant level. (See [ENGINE COOLANT LEVEL INSPECTION \[LF\]](#).)
3. Inspect the engine oil level. (See [ENGINE OIL LEVEL INSPECTION \[LF\]](#).)
4. Inspect the ATF level. (See [AUTOMATIC TRANSMISSION FLUID \(ATF\) LEVEL ADJUSTMENT \[SJ6A-EL\]](#).)
5. Inspect the idle speed. (See [ENGINE TUNE-UP\[LF\]](#).)
6. Inspect the ignition timing. (See [ENGINE TUNE-UP\[LF\]](#).)
7. Wait until the engine and transmission reach normal operating temperature.

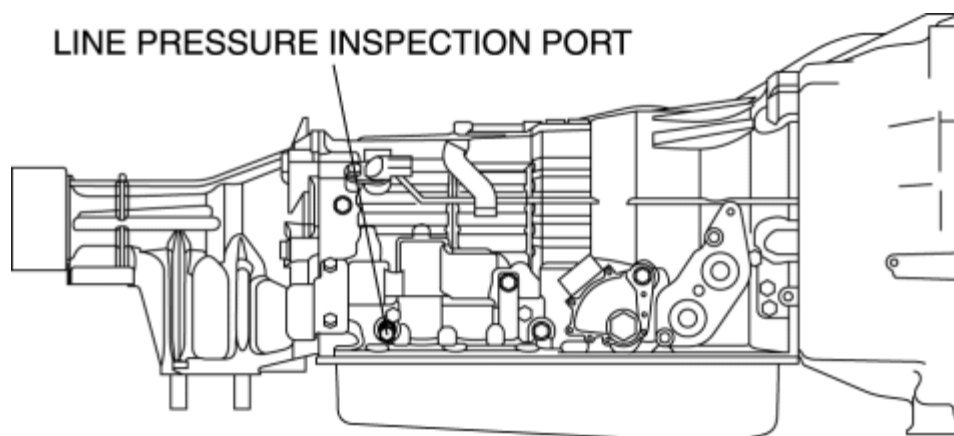
#### Line Pressure Test

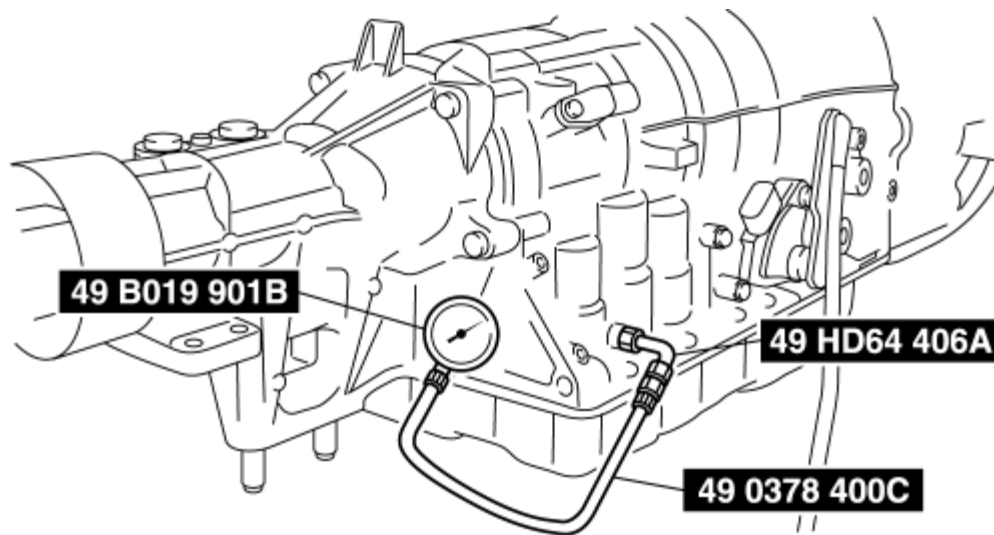
1. Perform mechanical system test preparation. (See [Mechanical System Test Preparation](#).)

#### WARNING:

- Removing the square head plug when the ATF is hot can be dangerous. Hot ATF can come out of the opening and badly burn you. Before removing the square head plug, allow the ATF to cool.

2. Connect the **SSTs** (49 HD64 406A, 49 0378 400C) to the line pressure inspection port and replace the gauge of the **SST** (49 0378 400C) with the **SST** (49 B019 901B).





3. Start the engine and warm it up until the ATF reaches **60—70 °C {140—158 °F}**.
4. Shift the selector lever to the D range.
5. Read the line pressure while the engine is idling for the D range.
6. Read the line pressure while the engine is idling for the P, R, N positions range in the same manner as in Steps 4—5.
7. Stop the engine, then replace the **SST** (49 B019 901B) with the gauge of the **SST** (49 0378 400C).
8. Start the engine.
9. Firmly depress the brake pedal with the left foot.
10. Shift the selector lever to the D range.

**CAUTION:**

- If the accelerator pedal is pressed for more than 5 s while the brake pedal is pressed, the transmission could be damaged. Therefore, perform Steps 11 and 12 within 5 s.

11. Gradually depress the accelerator pedal with the right foot.
12. When the engine speed no longer increases, quickly read the line pressure and release the accelerator pedal.
13. Shift the selector lever to the N position and idle the engine for **1 min or more** to cool the ATF.
14. Read the line pressure at the engine stall speed for the D and R position in the same manner as in Steps 9—13. **Line pressure**

Position/Range		Specification (kPa {kgf/cm <sup>2</sup> , psi})
D, M	Idle	355—425 {3.7—4.3, 52—61}
	Stall	863—959 {8.8—9.7, 126—139}

R	Idle	804—942 {8.2—9.6, 117—136}
	Stall	1,424—1,608 {14.6—16.3, 207—233}

#### **WARNING:**

- Removing the square head plug when the ATF is hot can be dangerous. Hot ATF can come out of the opening and badly burn you. Before removing the square head plug, allow the ATF to cool.

15. Remove the **SSTs**.

16. Install the test plug and O-ring in the inspection port.

#### **Tightening torque**

- 5.9—8.8 N·m {61—89 kgf·cm, 53—77 in·lbf}

#### **Evaluation of line pressure test**

Condition	Possible cause
High pressure in all ranges	<ul style="list-style-type: none"> <li>• Line pressure control solenoid malfunction</li> <li>• Primary regulator valve malfunction</li> </ul>
Low pressure in all ranges	<ul style="list-style-type: none"> <li>• Line pressure control solenoid malfunction</li> <li>• Primary regulator valve malfunction</li> <li>• Oil pump malfunction</li> </ul>
Low pressure in D range only	<ul style="list-style-type: none"> <li>• Hydraulic circuit of D malfunction</li> <li>• C1 clutch malfunction</li> </ul>
Low pressure in R position only	<ul style="list-style-type: none"> <li>• Hydraulic circuit of R malfunction</li> <li>• C3 clutch malfunction</li> <li>• B4 brake malfunction</li> </ul>

#### **Stall Speed Test**

1. Perform mechanical system test preparation. (See [Mechanical System Test Preparation](#).)
2. Start the engine.
3. Firmly depress the brake pedal with the left foot.
4. Shift the selector lever to the D range.

**CAUTION:**

- If the accelerator pedal is pressed for more than 5 s while the brake pedal is pressed, the transmission could be damaged. Therefore, perform Steps 5 and 6 within 5 s.

5. Gently depress the accelerator pedal with the right foot.
6. When the engine speed no longer increases, quickly read the engine speed and release the accelerator pedal.
7. Shift the selector lever to the N position and idle the engine for **1 min or more** to cool the ATF.
8. Perform a stall test of the D and R position in the same manner as in Steps 3—7.
9. Turn off the engine. **Engine stall speed**

Position/Range	Specification (rpm)
D, R, M	2,307—2,607

**Evaluation of stall test**

Condition	Possible cause
Low pressure in all ranges	<ul style="list-style-type: none"><li>• Engine lack of power</li><li>• Torque converter one-way clutch malfunction</li></ul>
High pressure in D range only	<ul style="list-style-type: none"><li>• Insufficient line pressure</li><li>• C1 clutch malfunction (slippage)</li><li>• F3 one-way clutch malfunction</li></ul>
High pressure in R range only	<ul style="list-style-type: none"><li>• Insufficient line pressure</li><li>• B4 brake malfunction (slippage)</li><li>• C3 clutch malfunction (slippage)</li><li>• F1 one-way clutch malfunction</li></ul>
High pressure in all ranges	<ul style="list-style-type: none"><li>• Insufficient line pressure</li><li>• Oil leakage from each range circuit</li></ul>

**Time Lag Test**

1. Perform mechanical system test preparation. (See **Mechanical System Test Preparation**.)

2. Start the engine.
3. Warm up the engine until the ATF temperature reaches **60—70°C { 140—158°F }**.
4. Shift the selector lever from the N position to D range.
5. Use a stopwatch to measure the time it takes from shifting until shock is felt. Take three measurements for each test and average from the results using the following formula.

#### Formula

- Average time lag = (Time 1 + Time 2 + Time 3) / 3

6. Perform the test for the following shifts in the same manner Step 5.

- N position → R position

#### Time lag

- N position → D range: 0.7 s or less
- N position → R position: 1.2 s or less

#### Evaluation of time lag test

Condition	Possible Cause
N → D shift	<ul style="list-style-type: none"> <li>• Insufficient line pressure</li> <li>• C1 clutch malfunction (slippage)</li> <li>• F3 one-way clutch malfunction</li> </ul>
N → R shift	<ul style="list-style-type: none"> <li>• Insufficient line pressure</li> <li>• C1 clutch malfunction (slippage)</li> <li>• C3 clutch malfunction (slippage)</li> <li>• F1 one-way clutch malfunction</li> </ul>

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AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION [SJ6A-EL]

- 1. Remove the battery cover.
- 2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
- 3. Drain the ATF. (See [AUTOMATIC TRANSMISSION FLUID \(ATF\) REPLACEMENT \[SJ6A-EL\].](#))
- 4. Loosen the starter installation bolts only enough that the starter is loose, but not removed. (See [STARTER REMOVAL/INSTALLATION \[LF\].](#))
- 5. Remove in the order indicated in the table.
- 6. Install in the reverse order of removal.
- 7. Add ATF and, with the engine idling, inspect the ATF level and inspect for leakage. (See [AUTOMATIC TRANSMISSION FLUID \(ATF\) LEVEL ADJUSTMENT \[SJ6A-EL\].](#))
- 8. Inspect selector lever operation. (See [SELECTOR LEVER INSPECTION.](#))
- 9. Inspect for leakage of ATF from all connecting points.
- 10. Perform the mechanical system test. (See [MECHANICAL SYSTEM TEST \[SJ6A-EL\].](#))

Service item	Test item		
	Line pressure test	Stall speed test	Time lag test
Automatic transmission replacement	×		
Control valve body replacement	×	×	×
Torque converter replacement	×	×	

- 11. Perform the road test. (See [ROAD TEST \[SJ6A-EL\].](#))



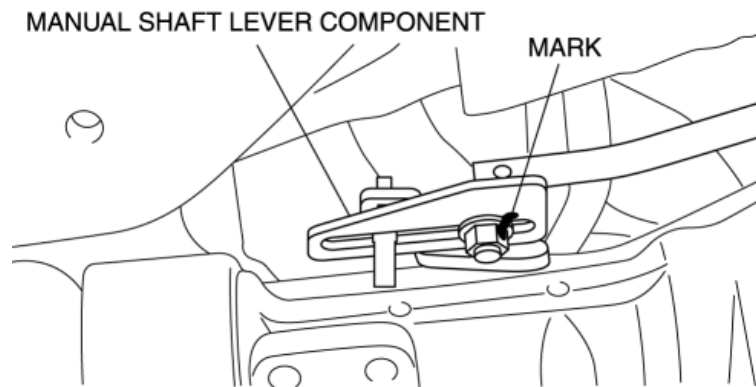
1	Tunnel member component
2	Middle pipe (See <a href="#">EXHAUST SYSTEM REMOVAL/INSTALLATION [LF].</a> )
3	Manual shaft lever component (See <a href="#">Manual Shaft Lever Component Removal Note.</a> ) (See <a href="#">Manual Shaft Lever Component Installation Note.</a> )
4	Transverse member
5	Under cover
6	Torque converter installation nuts (See <a href="#">Torque Converter Installation Nuts Removal Note.</a> ) (See <a href="#">Torque Converter Installation Nuts Installation Note.</a> )
7	Oil pipe, oil hose (See <a href="#">OIL COOLER REMOVAL/INSTALLATION [SJ6A-EL].</a> )
8	Insulator
9	TR switch connector
10	Solenoid valve connector
11	VSS connector
12	Turbine sensor connector
13	Oil pressure switch connector (for oil filter)
14	Wiring harness
15	Power plant frame (See <a href="#">Power Plant Frame Removal Note.</a> ) (See <a href="#">Power Plant Frame Installation Note.</a> )
16	Hanger bracket
17	Propeller shaft (See <a href="#">Propeller Shaft Removal Note.</a> ) (See <a href="#">PROPELLER SHAFT REMOVAL/INSTALLATION.</a> )
18	Transmission installation bolt and nut
19	Transmission (See <a href="#">Transmission Removal Note.</a> ) (See <a href="#">Transmission Installation Note.</a> )
20	Stopper



21	Bolt
22	Hose clamp
23	Breather hose
24	Breather tube
25	Stiffener
26	Side cover

### Manual Shaft Lever Component Removal Note

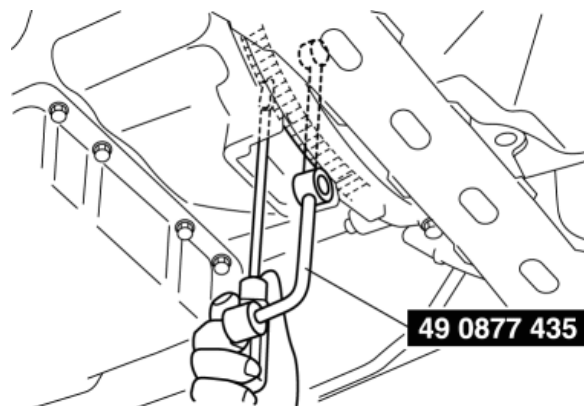
1. Mark the manual shaft lever component as shown in the figure.

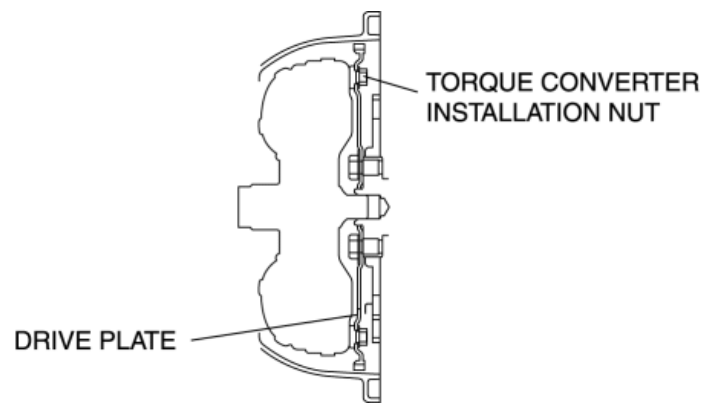


2. Remove the manual shaft lever component installation nut.

### Torque Converter Installation Nuts Removal Note

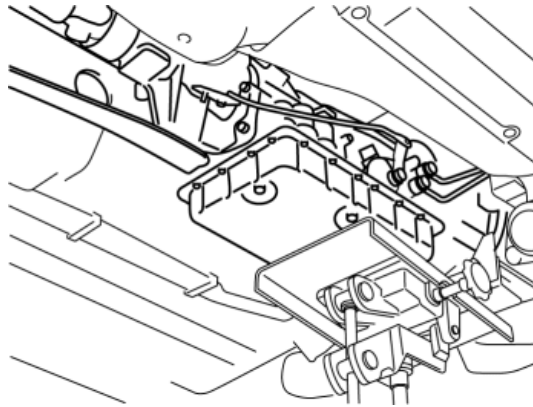
1. Lock the drive plate using a flathead screwdriver as shown in the figure.
2. Remove the torque converter installation nuts using a **SST**.





### Power Plant Frame Removal Note

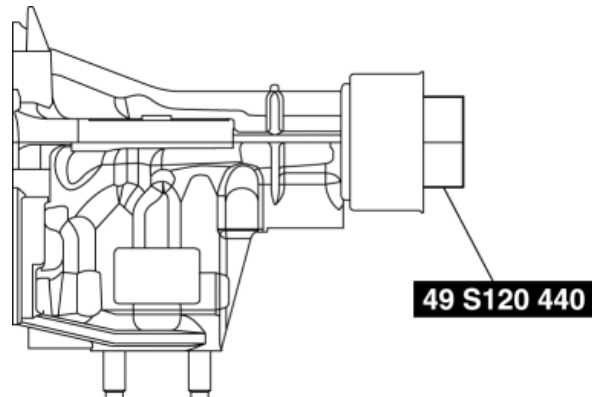
1. Support the transmission using a transmission jack.



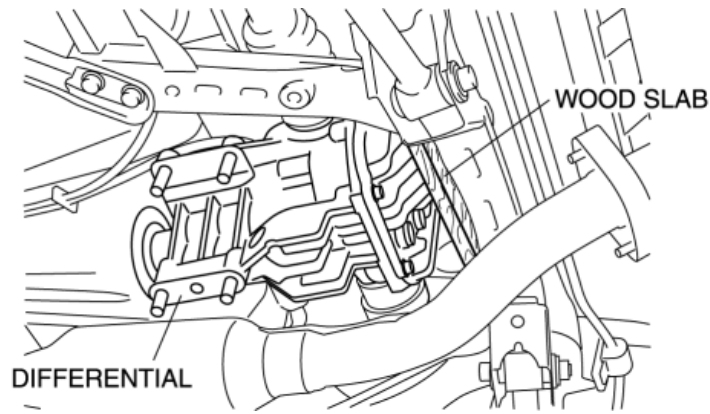
2. Remove the power plant frame.

### Propeller Shaft Removal Note

1. Install the **SST** to the output shaft.



2. Insert a slab of wood behind the differential and remove the propeller shaft.



### Transmission Removal Note

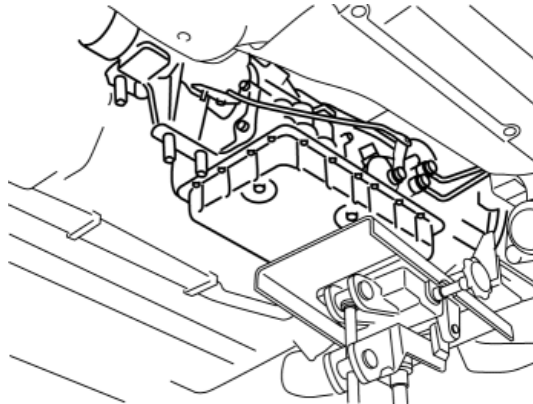
#### WARNING:

- Verify that the transmission is securely supported by the jack. If the transmission falls, serious injury or death and damage to the vehicle could result. Before removing the transmission make sure that the jack is securely supporting the transmission.

#### CAUTION:

- To prevent the torque converter and transmission from separating, remove the transmission without tilting it toward the torque converter.

1. Support the transmission securely using a transmission jack.



2. Remove the transmission installation bolt.

### Transmission Installation Note

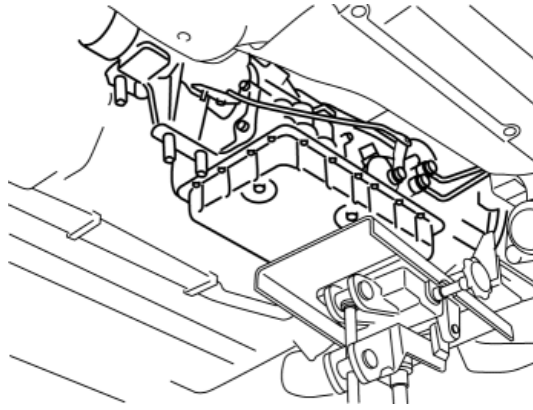
#### WARNING:

- Verify that the transmission is securely supported by the jack. If the transmission falls, serious injury or death and damage to the vehicle could result. Before removing the transmission make sure that the jack is securely supporting the transmission.

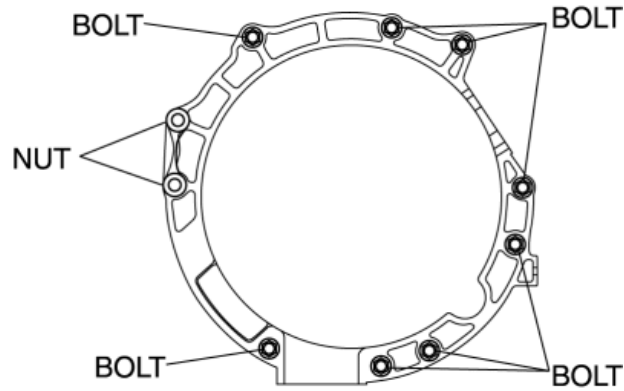
#### CAUTION:

- To prevent the torque converter and transmission from separating, remove the transmission without tilting it toward the torque converter

1. Support the transmission securely using a transmission jack.



2. Tighten the transmission installation bolts and nuts.

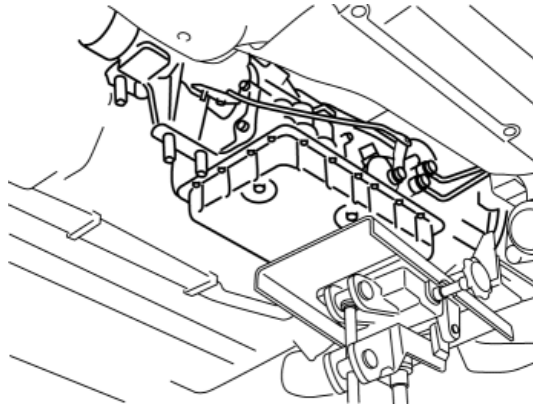


#### Tightening torque

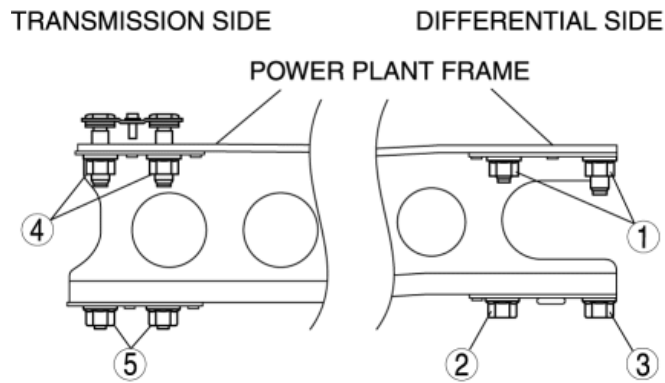
- 37—52 N·m {3.8—5.3 kgf·m, 28—38 ft·lbf}

#### Power Plant Frame Installation Note

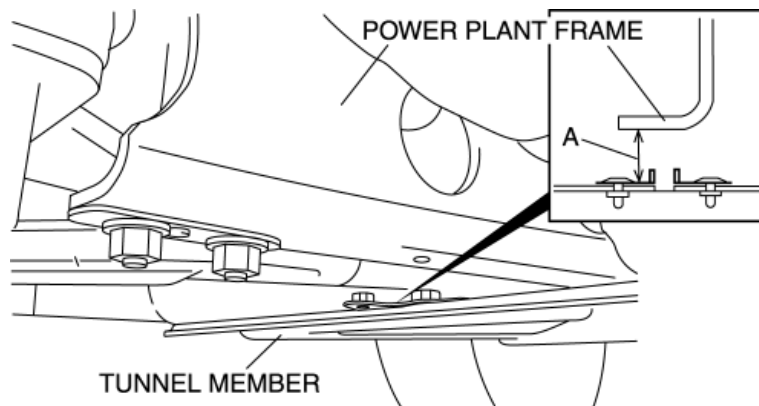
1. Support the transmission and differential so that they are level using a transmission jack.



2. Install the power plant frame.
3. Temporarily tighten the nuts 1, 2, 3 in order shown in the figure.



4. Tighten nut 2 until the power plant frame is seated in the rear differential.
5. Temporarily tighten the nuts 4, 5 in order shown in the figure.
6. Install the middle pipe and tunnel member.
7. Raise the front end of the power plant frame (transmission side) or the transmission with the transmission jack, and adjust dimension A to **26.7—34.7 mm {1.06—1.36 in}** (lower surface of power plant frame-upper surface of the tunnel member) as shown in the figure.



8. Tighten the power plant frame installation nuts.

#### **Tightening torque**

- 126—154 N·m {12.9—15.7 kgf·m, 93.0—113.5 ft·lbf}

9. Verify that dimension A is within the specification with the transmission jack and the adjustment bolt removed.

- If not within the specification, adjust dimension A again.

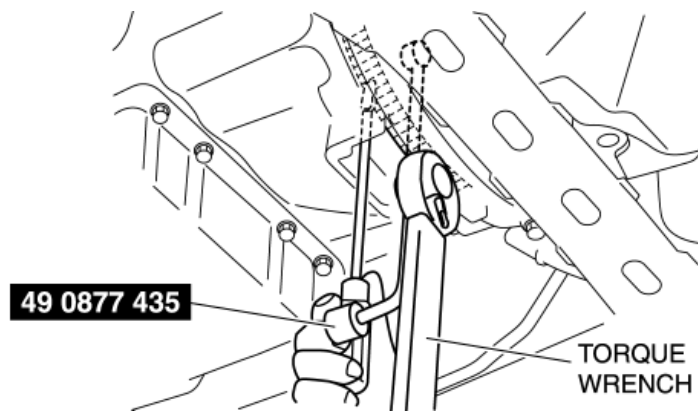
#### **Torque Converter Installation Nuts Installation Note**

1. Align the holes by turning the torque converter.
2. Lock the drive plate using a flathead screwdriver.

#### **CAUTION:**

- Loosely and equally tighten the torque converter nuts, then further tighten them to the specified tightening torque.

3. Tighten the torque converter installation nuts.

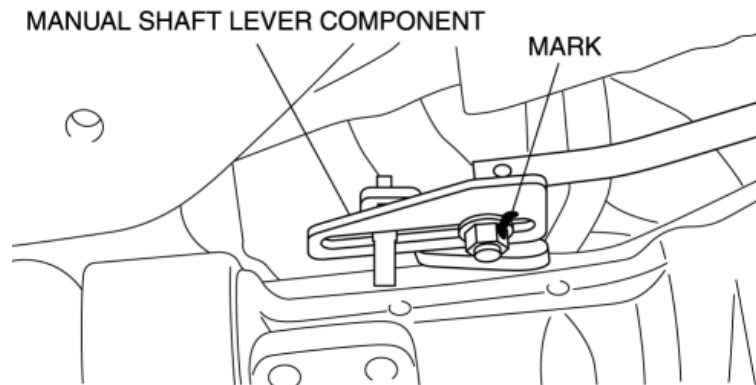


#### Tightening torque

- 34—49 N·m {3.5—4.9 kgf·m, 26—36 ft·lbf}

#### Manual Shaft Lever Component Installation Note

1. Align the mark of the manual shaft lever component as shown in the figure.



2. Install the manual shaft lever component installation nut.

#### Tightening torque

- 10.8—14.7 N·m {111—149 kgf·cm, 96.4—129.3 in·lbf}

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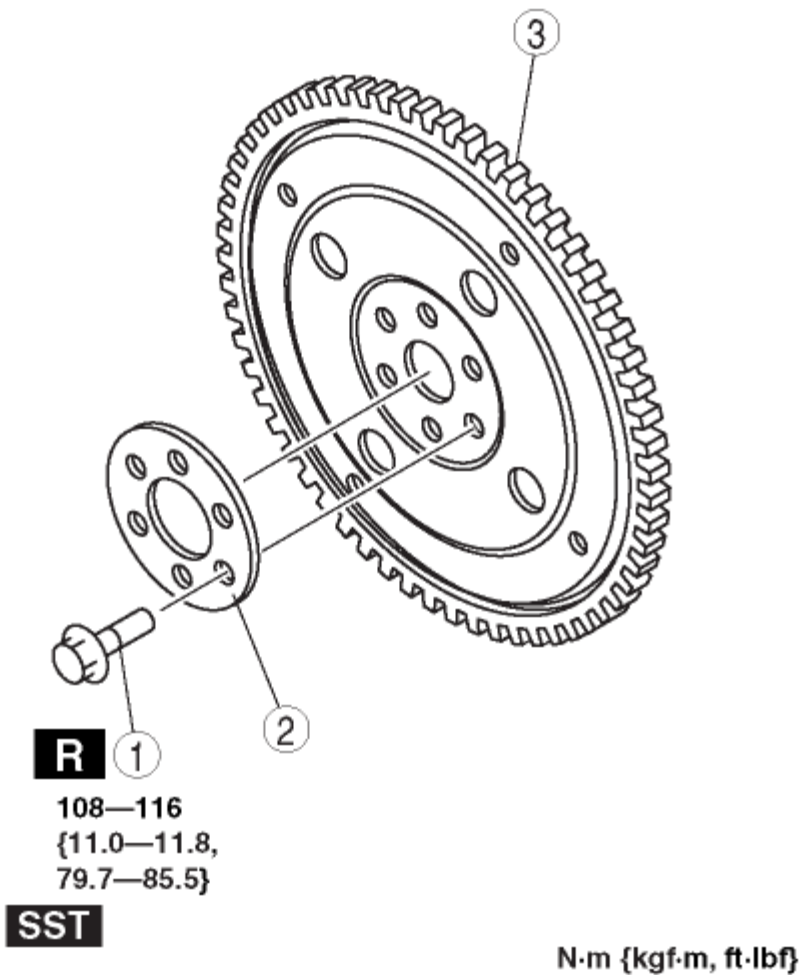
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DRIVE PLATE REMOVAL/INSTALLATION [SJ6A-EL]

- 1. Remove the transmission. (See [AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION \[SJ6A-EL\]](#).)
- 2. Remove in the order indicated in the table.
- 3. Install in the reverse order of removal.



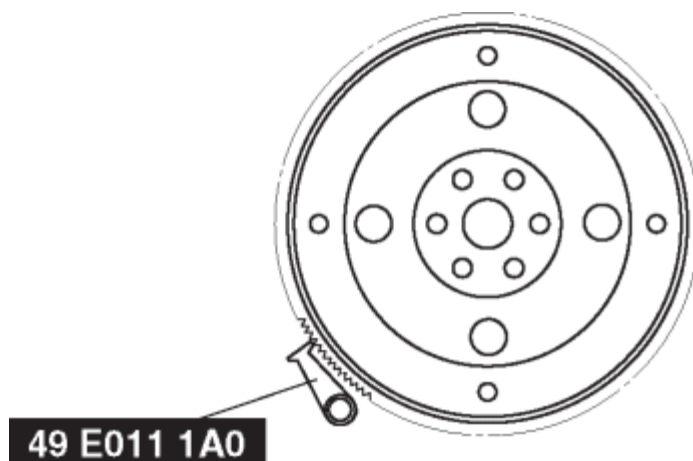
1	Bolt
2	Backing plate
3	Drive plate

(See [Drive Plate Removal Note](#).)

(See [Drive Plate Installation Note](#).)

### Drive Plate Removal Note

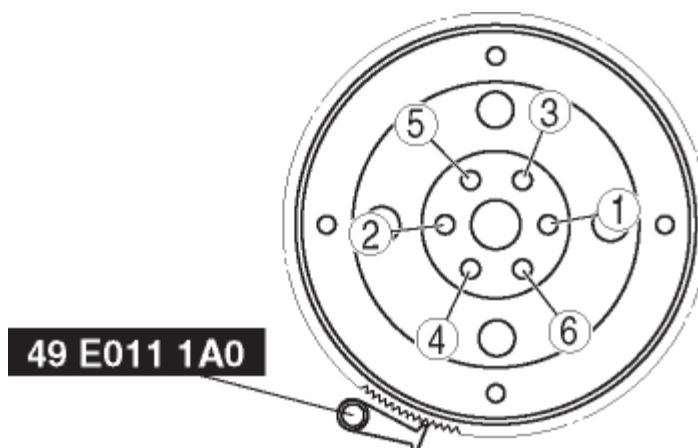
1. Set the **SST** or equivalent against the drive plate.



2. Remove the bolts and the drive plate.

### Drive Plate Installation Note

1. Remove the sealant from the bolt holes in the crankshaft.
2. Install the drive plate.
3. Install the backing plate.
4. Set the **SST** or equivalent against the drive plate.
5. Tighten the drive plate mounting bolts in two or three steps in the order as shown in the figure.



**Tightening torque**



- 108—116 N·m

{ 11.0—11.8 kgf·m, 79.7—85.5 ft·lbf }

6. Install the transmission. (See [AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION \[SJ6A-EL\]](#).)

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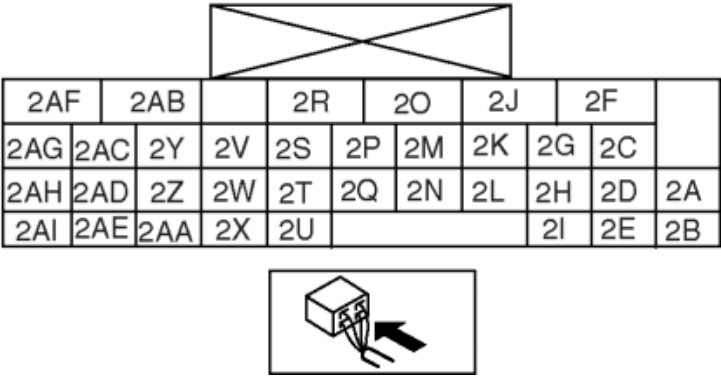
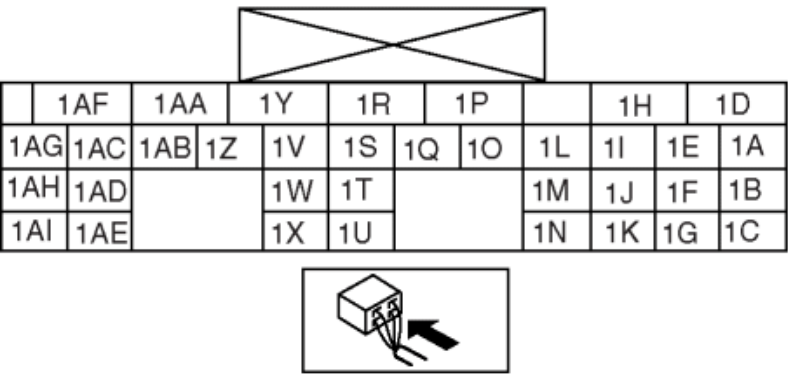
TCM INSPECTION [SJ6A-EL]

Terminal Voltage Table (Reference)

NOTE:

- Use the ground of terminal 1P and 1X of the TCM when measuring terminal voltage, as an error may occur when connecting the negative circuit tester to ground.

TCM WIRING HARNESS-SIDE CONNECTOR



Terminal	Signal	Connected to	Test Condition	Voltage (V)	Action
1A	—	—	—	—	—
1B	—	—	—	—	—
1C	CAN_L	PCM	Because this terminal is for serial communication, good/no good judgment by terminal voltage is not possible. Carry out inspection according to DTCs.	—	<ul style="list-style-type: none"><li>• Inspect the related wiring harness</li></ul>
1D	TCC control solenoid GND	TCC control solenoid	<ul style="list-style-type: none"><li>• Inspect using the wave profile. (See <a href="#">Inspection Using An Oscilloscope (Reference)</a>.)</li></ul>		<ul style="list-style-type: none"><li>• Inspect the TCC control solenoid  (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>)</li><li>• Inspect the related wiring harness</li></ul>

1E	Line pressure control solenoid GND	Line pressure control solenoid	P, N position, Idle	Below 1.0	<ul style="list-style-type: none"> <li>Inspect the line pressure control solenoid</li> </ul> <p>(See <b>SOLENOID VALVE INSPECTION [SJ6A-EL]</b>)</p> <ul style="list-style-type: none"> <li>Inspect the related wiring harness</li> </ul>
1F	—	—	—	—	—
1G	CAN_H	PCM	Because this terminal is for serial communication, good/no good judgment by terminal voltage is not possible. Carry out inspection according to DTCs.	—	<ul style="list-style-type: none"> <li>Inspect the related wiring harness</li> </ul>
1H	—	—	—	—	—
1I	—	—	—	—	—
1J	ATF temperature (+)	TFT sensor	ATF temperature 20°C {68°F}	Approx. 3.0	<ul style="list-style-type: none"> <li>Inspect the TFT sensor</li> </ul> <p>(See <b>TRANSMISSION FLUID TEMPERATURE (TFT) SENSOR INSPECTION [SJ6A-EL]</b>)</p> <ul style="list-style-type: none"> <li>Inspect the related wiring harness</li> </ul>
			ATF temperature 40°C {104°F}	Approx. 2.14	
			ATF temperature 60°C {140°F}	Approx. 1.38	
1K	—	—	—	—	—
1L	Shift solenoid G GND	Shift solenoid G	<ul style="list-style-type: none"> <li>Inspect using the wave profile.</li> </ul> <p>(See <b>Inspection Using An Oscilloscope (Reference)</b>.)</p>		<ul style="list-style-type: none"> <li>Inspect the shift solenoid G</li> </ul> <p>(See <b>SOLENOID VALVE INSPECTION [SJ6A-EL]</b>)</p> <ul style="list-style-type: none"> <li>Inspect the related wiring harness</li> </ul>
1M	TFT sensor GND	TFT sensor	Under any condition	Continuity	<ul style="list-style-type: none"> <li>Inspect the related wiring harness</li> </ul>

1N	—	—	—	—	—
1O	Shift solenoid F GND	Shift solenoid F	<ul style="list-style-type: none"><li>Inspect using the wave profile. (See <a href="#">Inspection Using An Oscilloscope (Reference)</a>.)</li></ul>		<ul style="list-style-type: none"><li>Inspect the shift solenoid F  (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>)</li><li>Inspect the related wiring harness</li></ul>
1P	System GND	GND	Under any condition	Continuity	<ul style="list-style-type: none"><li>Inspect the related wiring harness</li></ul>
1Q	TCC control solenoid control	TCC control solenoid	<ul style="list-style-type: none"><li>Inspect using the wave profile. (See <a href="#">Inspection Using An Oscilloscope (Reference)</a>.)</li></ul>		<ul style="list-style-type: none"><li>Inspect the TCC control solenoid  (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>)</li><li>Inspect the related wiring harness</li></ul>
1R	Line pressure control solenoid control	Line pressure control solenoid	<ul style="list-style-type: none"><li>Inspect using the wave profile. (See <a href="#">Inspection Using An Oscilloscope (Reference)</a>.)</li></ul>		<ul style="list-style-type: none"><li>Inspect the line pressure control solenoid  (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>)</li><li>Inspect the related wiring harness</li></ul>
1S	Shift solenoid D control	Shift solenoid D	5GR, 6GR	B+	<ul style="list-style-type: none"><li>Inspect the shift solenoid D  (See <a href="#">SOLENOID VALVE INSPECTION [SJ6A-EL]</a>)</li><li>Inspect the related wiring harness</li></ul>
			1GR, 2GR, 3GR, 4GR	Below 1.0	
1T	—	—	—	—	—

1U	—	—	—	—	—
1V	Shift solenoid E control	Shift solenoid E	1GR, 2GR, 3GR, 4GR	B+	<ul style="list-style-type: none"><li>Inspect the shift solenoid E</li></ul> <p>(See <b>SOLENOID VALVE INSPECTION [SJ6A-EL]</b>)</p> <ul style="list-style-type: none"><li>Inspect the related wiring harness</li></ul>
			5GR, 6GR	Below 1.0	
1W	—	—	—	—	—
1X	System GND	GND	Under any condition	Continuity	<ul style="list-style-type: none"><li>Inspect the related wiring harness</li></ul>
1Y	Shift solenoid G control	Shift solenoid G	<ul style="list-style-type: none"><li>Inspect using the wave profile.</li></ul> <p>(See <b>Inspection Using An Oscilloscope (Reference)</b>.)</p>		<ul style="list-style-type: none"><li>Inspect the shift solenoid G</li></ul> <p>(See <b>SOLENOID VALVE INSPECTION [SJ6A-EL]</b>)</p> <ul style="list-style-type: none"><li>Inspect the related wiring harness</li></ul>
1Z	Shift solenoid F control	Shift solenoid F	<ul style="list-style-type: none"><li>Inspect using the wave profile.</li></ul> <p>(See <b>Inspection Using An Oscilloscope (Reference)</b>.)</p>		<ul style="list-style-type: none"><li>Inspect the shift solenoid F</li></ul> <p>(See <b>SOLENOID VALVE INSPECTION [SJ6A-EL]</b>)</p> <ul style="list-style-type: none"><li>Inspect the related wiring harness</li></ul>
1AA	Shift solenoid C control	Shift solenoid C	1GR, 2GR, 3GR	B+	<ul style="list-style-type: none"><li>Inspect the shift solenoid C</li></ul> <p>(See <b>SOLENOID VALVE INSPECTION [SJ6A-EL]</b>)</p> <ul style="list-style-type: none"><li>Inspect the related wiring harness</li></ul>
			4GR, 5GR, 6GR	Below 1.0	

1AB	Shift solenoid B control	Shift solenoid B	1GR, 2GR, 6GR	B+	Inspect the shift solenoid B  (See <b>SOLENOID VALVE INSPECTION [SJ6A-EL]</b> )  • Inspect the related wiring harness
			3GR, 4GR, 5GR	Below 1.0	
1AC	—	—	—	—	—
1AD	Power supply	Battery	Constant	B+	• Inspect the related wiring harness
1AE	IG	Ignition switch	Ignition switch ON	B+	• Inspect the Ignition switch  (See <b>IGNITION SWITCH INSPECTION</b> )  • Inspect the related wiring harness
			Ignition switch OFF (See <b>SOLENOID VALVE INSPECTION [SJ6A-EL]</b> )	Below 1.0	
1AF	Shift solenoid A control	Shift solenoid A	2GR, 3GR, 4GR, 5GR, 6GR	B+	• Inspect the shift solenoid A  (See <b>SOLENOID VALVE INSPECTION [SJ6A-EL]</b> )  • Inspect the related wiring harness
			1GR	Below 1.0	
1AG	—	—	—	—	—
1AH	—	—	—	—	—
1AI	IG	Ignition switch	Ignition switch ON	B+	• Inspect the Ignition switch  (See <b>IGNITION SWITCH INSPECTION</b> )  • Inspect the related wiring harness
			Ignition switch OFF	Below 1.0	
					• Inspect the turbine sensor

2A	Turbine speed (+)	Turbine sensor	<ul style="list-style-type: none"><li>Inspect using the wave profile. (See <a href="#">Inspection Using An Oscilloscope (Reference)</a>.)</li></ul>		<p>(See <a href="#">TURBINE SENSOR INSPECTION [SJ6A-EL]</a>)</p> <ul style="list-style-type: none"><li>Inspect the related wiring harness</li></ul>
2B	Turbine speed (-)	Turbine sensor	Ignition switch ON	Approx. 2.54	<ul style="list-style-type: none"><li>Inspect the turbine sensor  (See <a href="#">TURBINE SENSOR INSPECTION [SJ6A-EL]</a>)</li><li>Inspect the related wiring harness</li></ul>
2C	Vehicle speed (-)	VSS	Ignition switch ON	Approx. 2.5	<ul style="list-style-type: none"><li>Inspect the VSS  (See <a href="#">VEHICLE SPEED SENSOR (VSS) INSPECTION [SJ6A-EL]</a>)</li><li>Inspect the related wiring harness</li></ul>
2D	Vehicle speed (+)	VSS	<ul style="list-style-type: none"><li>Inspect using the wave profile. (See <a href="#">Inspection Using An Oscilloscope (Reference)</a>.)</li></ul>		<ul style="list-style-type: none"><li>Inspect the VSS  (See <a href="#">VEHICLE SPEED SENSOR (VSS) INSPECTION [SJ6A-EL]</a>)</li><li>Inspect the related wiring harness</li></ul>
2E	Turbine sensor wiring harness shield GND	GND	Under any condition	Continuity	<ul style="list-style-type: none"><li>Inspect the related wiring harness</li></ul>
2F	Down switch (Selector lever component)	Down switch (Selector lever component)	Shift down (M range)	Below 1.0	<ul style="list-style-type: none"><li>Inspect the selector lever component  (See <a href="#">SELECTOR LEVER COMPONENT INSPECTION</a>)</li><li>Inspect the related wiring harness</li></ul>
			Other ranges, all positions	B+	

2G	M range switch	M range switch	M range	Below 1.0	<ul style="list-style-type: none"> <li>Inspect the selector lever component</li> </ul> <p>(See <b>SELECTOR LEVER COMPONENT INSPECTION</b>)</p> <ul style="list-style-type: none"> <li>Inspect the related wiring harness</li> </ul>
			Other positions, all ranges	B+	
2H	VSS wiring harness shield GND	GND	Under any condition	Continuity	<ul style="list-style-type: none"> <li>Inspect the related wiring harness</li> </ul>
2I	—	—	—	—	—
2J	Up switch (Selector lever component)	Up switch (Selector lever component)	Shift up (M range)	Below 1.0	<ul style="list-style-type: none"> <li>Inspect the selector lever component</li> </ul> <p>(See <b>SELECTOR LEVER COMPONENT INSPECTION</b>)</p> <ul style="list-style-type: none"> <li>Inspect the related wiring harness</li> </ul>
			Other ranges, all positions	B+	
2K	TR switch (D range)	TR switch	D range	B+	<ul style="list-style-type: none"> <li>Inspect the TR switch</li> </ul> <p>(See <b>TRANSMISSION RANGE (TR) SWITCH INSPECTION [SJ6A-EL]</b>)</p> <ul style="list-style-type: none"> <li>Inspect the related wiring harness</li> </ul>
			Other ranges, all positions	Below 1.0	
2L	—	—	—	—	—
2M	TR switch (R position)	TR switch	R position	B+	<ul style="list-style-type: none"> <li>Inspect the TR switch</li> </ul> <p>(See <b>TRANSMISSION RANGE (TR) SWITCH INSPECTION [SJ6A-EL]</b>)</p> <ul style="list-style-type: none"> <li>Inspect the related wiring harness</li> </ul>
			Other ranges, all positions	Below 1.0	



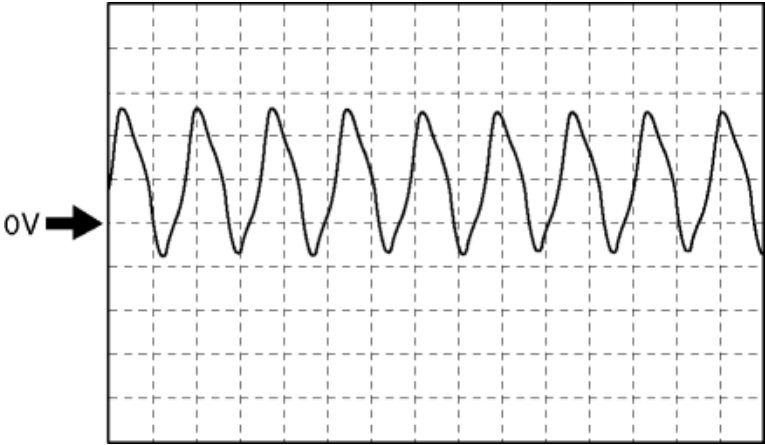
2N	TR switch (N position)	TR switch	N position	B+	Inspect the TR switch  (See <a href="#">TRANSMISSION RANGE (TR) SWITCH INSPECTION [SJ6A-EL]</a> )  • Inspect the related wiring harness
			Other positions, all ranges	Below 1.0	
2O	TR switch (P position)	TR switch	P position	B+	• Inspect the TR switch  (See <a href="#">TRANSMISSION RANGE (TR) SWITCH INSPECTION [SJ6A-EL]</a> )  • Inspect the related wiring harness
			Other positions, all ranges	Below 1.0	
2P	—	—	—	—	—
2Q	ATF temperature monitor mode control	TFT check connector	Under any condition	B+	• Inspect the related wiring harness
2R	—	—	—	—	—
2S	—	—	—	—	—
2T	—	—	—	—	—
2U	—	—	—	—	—
2V	—	—	—	—	—
2W	—	—	—	—	—
2X	—	—	—	—	—
2Y	—	—	—	—	—
2Z	—	—	—	—	—
2AA	—	—	—	—	—
2AB	Steering shift switch GND	Steering shift switch	Under any condition	Below 1.0	• Inspect the related wiring harness

2AC	—	—	—	—	—
2AD	—	—	—	—	—
2AE	—	—	—	—	—
2AF	Shift up/Shift down signal (Steering shift switch)	Steering shift switch	Up switch operated (Steering shift switch)	Approx. 2.0	<ul style="list-style-type: none"> <li>Inspect the steering shift switch</li> </ul> (See <b>STEERING SHIFT SWITCH INSPECTION</b> ) <ul style="list-style-type: none"> <li>Inspect the related wiring harness</li> </ul>
			Down switch operated (Steering shift switch)	Approx. 2.53	
			Others	Approx. 4.0	
2AG	—	—	—	—	—
2AH	—	—	—	—	—
2AI	—	—	—	—	—

Inspection Using An Oscilloscope (Reference)

Turbine sensor (+)

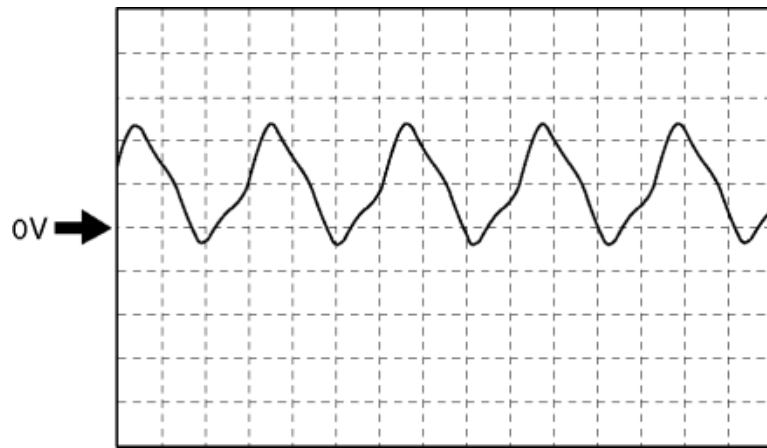
- TCM terminal: 2A



- Oscilloscope setting: 2 V/DIV (Y) 2 ms/DIV (X)
- Measuring condition: Vehicle speed at **30 km/h {19 mph}** (D range 1GR)

Vehicle speed (+)

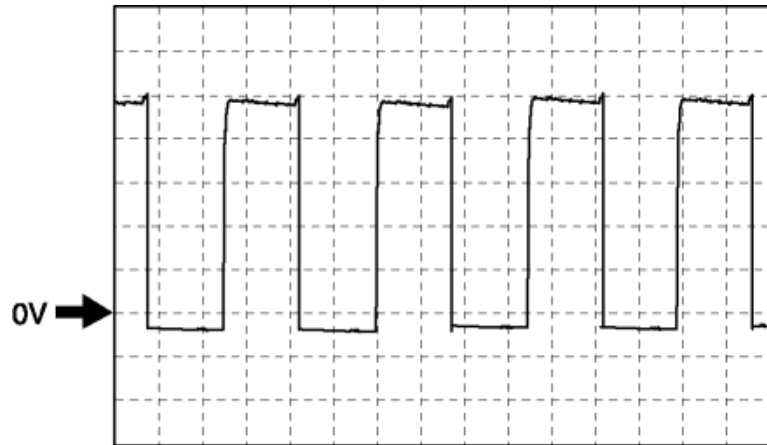
- TCM terminal: 2D



- Oscilloscope setting: 2.5 V/DIV (Y) 1 ms/DIV (X)
- Measuring condition: Vehicle speed at **30 km/h {19 mph}** (D range 1GR)

#### Shift solenoid F control (+)

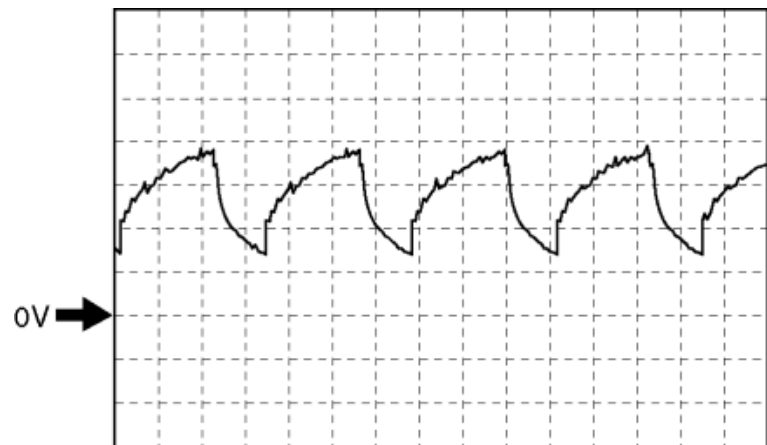
- TCM terminal: 1Z



- Oscilloscope setting: 2.5 V/DIV (Y) 1 ms/DIV (X)
- Measuring condition: M range 5GR

#### Shift solenoid F control (-)

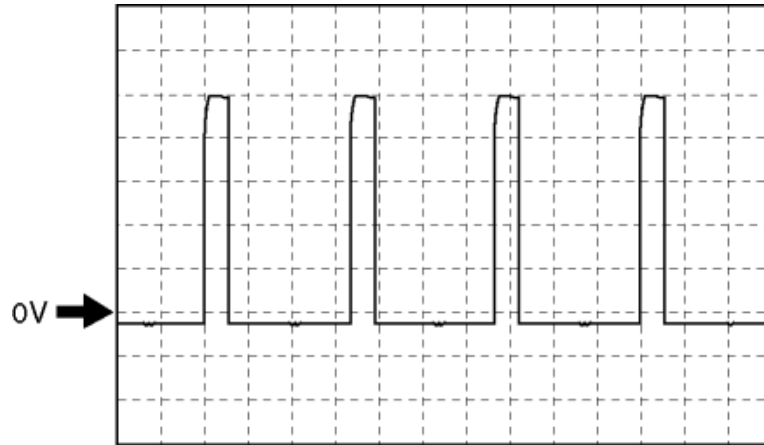
- TCM terminal: 1O



- Oscilloscope setting: 100 mV/DIV (Y) 1 ms/DIV (X)
- Measuring condition: M range 5GR

#### Shift solenoid G control (+)

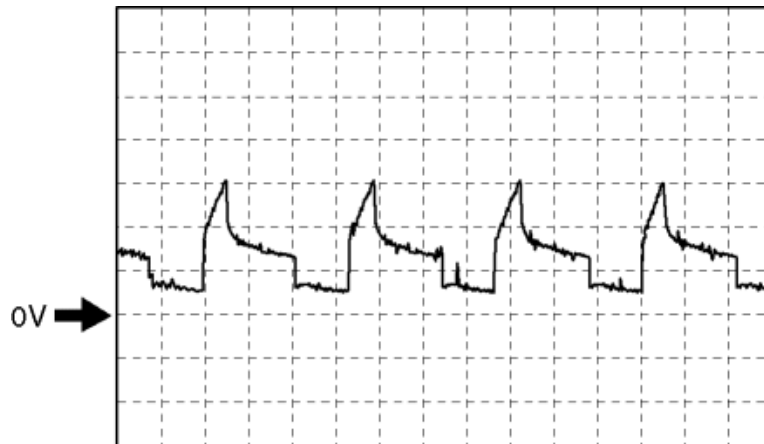
- TCM terminal: 1Y



- Oscilloscope setting: 2.5 V/DIV (Y) 1 ms/DIV (X)
- Measuring condition: M range 1GR

#### Shift solenoid G control (-)

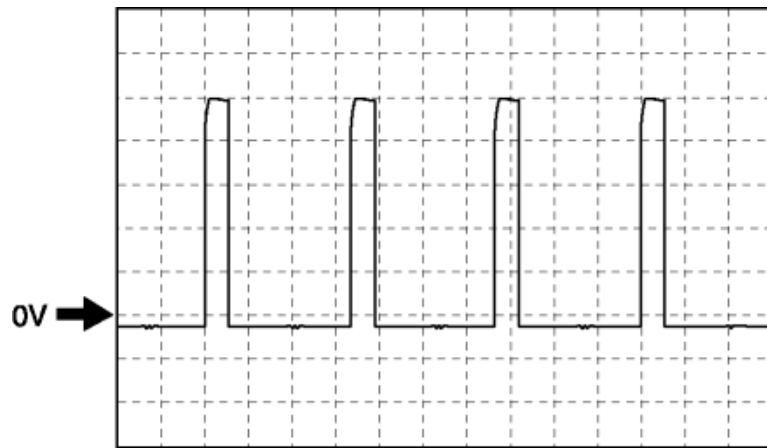
- TCM terminal: 1L



- Oscilloscope setting: 50 mV/DIV (Y) 1ms/DIV (X)
- Measuring condition: M range 1GR

#### TCC control solenoid control (+)

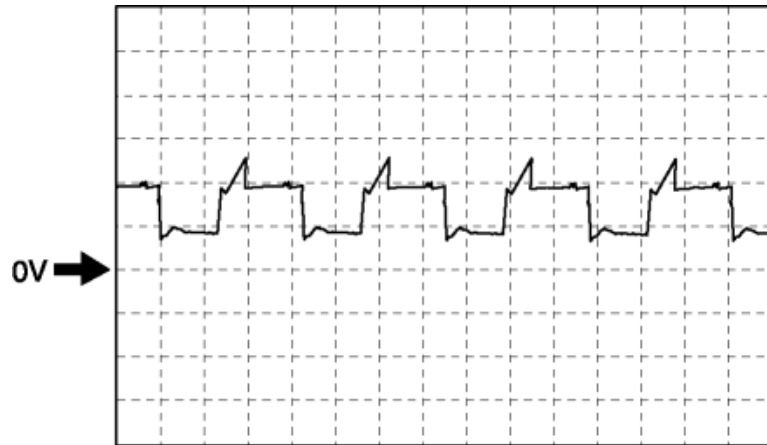
- TCM terminal: 1Q



- Oscilloscope setting: 2.5 V/DIV (Y) 1 ms/DIV (X)
- Measuring condition: P, N position, Idle

#### TCC control solenoid control (-)

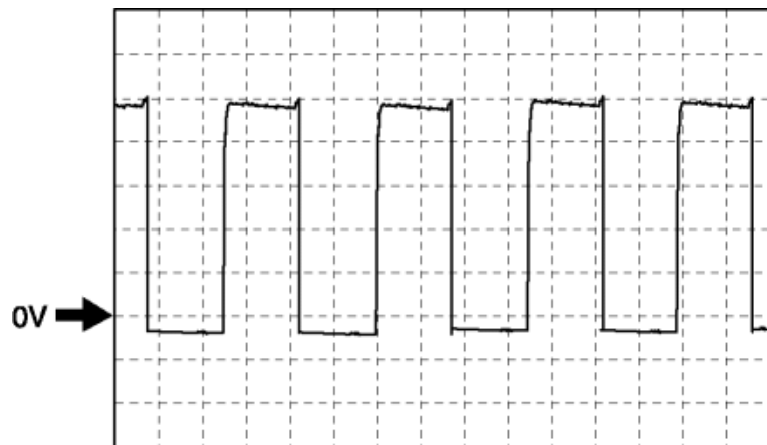
- TCM terminal: 1D



- Oscilloscope setting: 50 mV/DIV (Y) 1 ms/DIV (X)
- Measuring condition: P, N position, Idle

#### Line pressure control solenoid control (+)

- TCM terminal: 1R



- Oscilloscope setting: 2.5 V/DIV (Y) 1 ms/DIV (X)
- Measuring condition: P, N position, Idle

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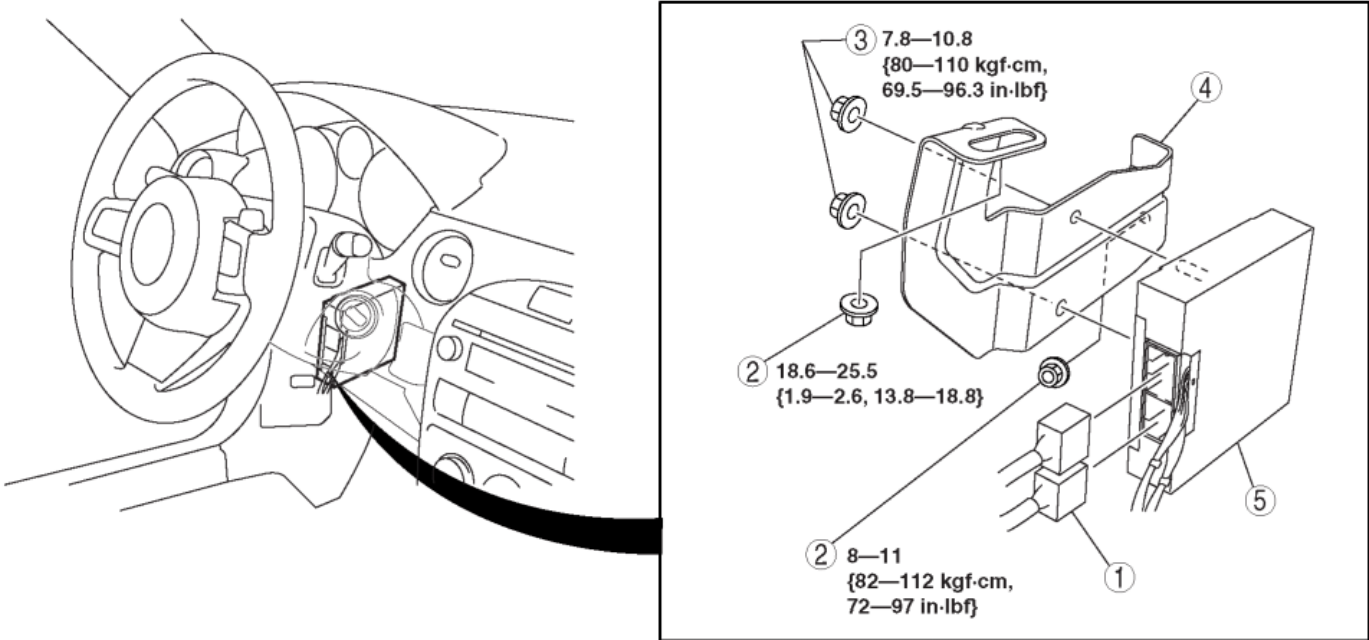
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2008 - MX-5 - Transmission/Transaxle

TCM REMOVAL/INSTALLATION [SJ6A-EL]

- 1. Remove the battery cover.
- 2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
- 3. Remove in the order indicated in the table.
- 4. Install in the reverse order of removal.



N·m {kgf·m, ft·lbf}

1	TCM connector
2	Nut
3	Nut
4	Bracket
5	TCM

2008 - MX-5 - Transmission/Transaxle

AUTOMATIC TRANSMISSION FLUID (ATF) INSPECTION [SJ6A-EL]

Automatic Transmission Fluid (ATF) Condition Inspection

1. Inspect the ATF for the following to determine whether the transmission should be disassembled.
- The ATF is muddy.
  - The ATF smells strange or unusual.

ATF Condition

Condition		Possible cause
Clear dark red	Normal	—
Light red (pink)	Contaminated with water	<ul style="list-style-type: none"><li>• Damaged oil cooler inside of the radiator</li></ul> <p>Problem could occur to parts inside the transmission by water contamination. It is necessary to overhaul the transmission and detect defected parts.</p> <p>If necessary, replace the transmission.</p>
Reddish brown	Has burnt smell and metal particles are found	<p>Defective the powertrain components inside the transmission:</p> <p>Particles cause wide range of problems by plugging up in oil pipe, control valve body and oil cooler in radiator.</p> <ul style="list-style-type: none"><li>• When large amount of metal particles are found, overhaul the transmission and inspect for defective parts.</li></ul> <p>If necessary, replace the transmission.</p> <ul style="list-style-type: none"><li>• Implement flushing operation as there is a possibility to have particles plugging up the oil pipe or oil cooler inside the radiator.</li></ul>
	Has no burnt smell	<ul style="list-style-type: none"><li>• Discoloration by oxidation</li></ul>





## 2008 - MX-5 - Transmission/Transaxle

### AUTOMATIC TRANSMISSION FLUID (ATF) REPLACEMENT [SJ6A-EL]

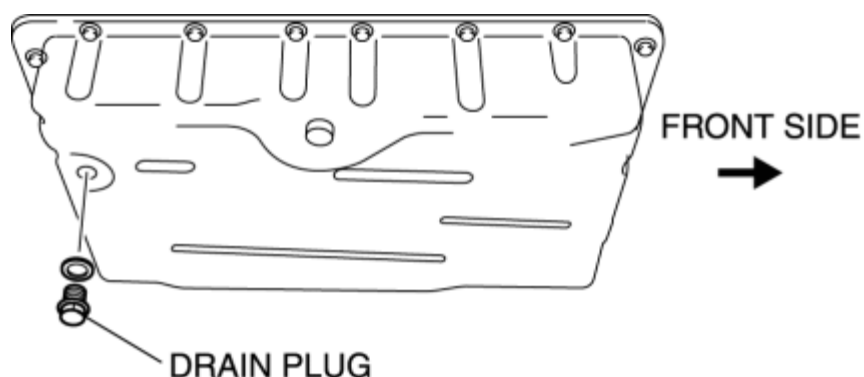
#### WARNING:

- A hot transmission and ATF can cause severe burns. Turn off the engine and wait until they are cool before replacing ATF.

#### NOTE:

- Do not mistake the overflow plug for the drain plug.

1. Remove the drain plug and the drain plug gasket from the oil pan.

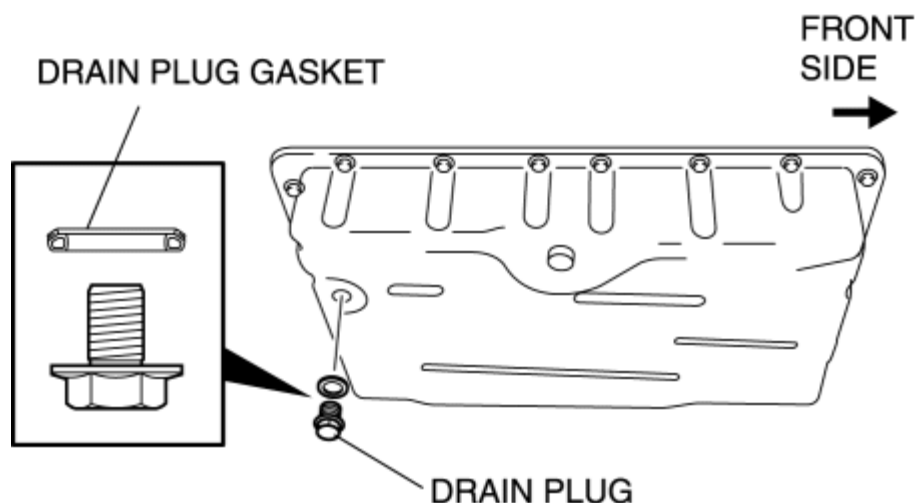


2. Drain the ATF into a container.
3. Clean the drain plug.

#### CAUTION:

- Be sure to install the drain plug gasket in the correct direction as shown in the figure.

4. Install a new drain plug gasket and the drain plug to the oil pan.



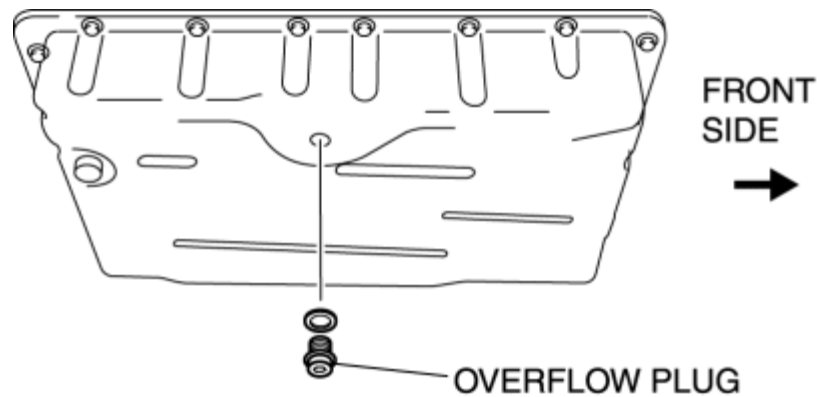
**Tightening torque**

- 17.5—22.5 N·m {1.8—2.2 kgf·m, 13.0—16.5 ft·lbf}

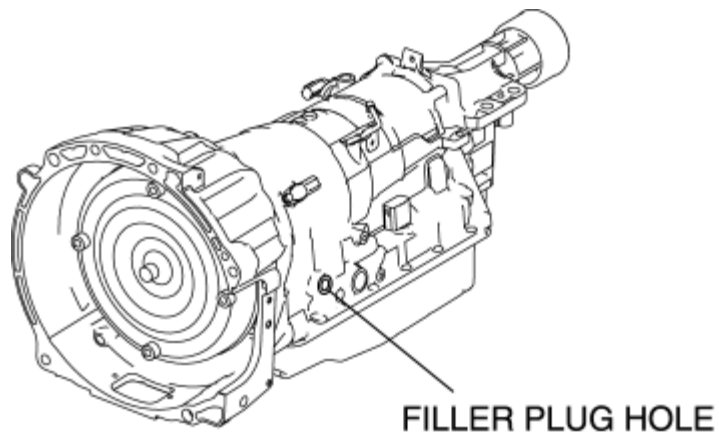
**NOTE:**

- Do not mistake the overflow plug for the drain plug.

5. Remove the overflow plug and the overflow plug gasket.



6. Remove the filler plug and the O-ring.



7. Add the specified type of ATF through the filler plug hole.

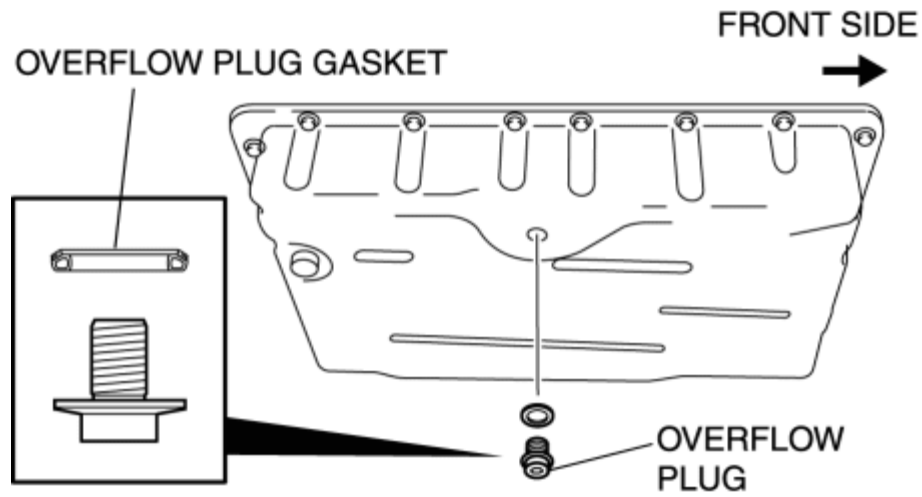
**ATF**

- Type: JWS3309
- Capacity (approx. quantity): 7.4 L {7.8 US qt, 6.5 Imp qt}

8. Verify the ATF is dripping from the overflow orifice.

**CAUTION:**

- Be sure to install the overflow plug gasket in the correct direction as shown in the figure.



9. Install a new overflow plug gasket and the overflow plug.

**Tightening torque**

- 17.5—22.5 N·m {1.8—2.2 kgf·m, 13.0—16.5 ft·lbf}

**NOTE:**

- Replace the O-ring if it has malfunction.

10. Coat a new O-ring with ATF, and install it to the filler plug.

**Tightening torque**

- 23.5—54.9 N·m {2.4—5.5 kgf·m, 17.4—40.4 ft·lbf}

**CAUTION:**

- Always adjust the ATF level when replacing the ATF so that the appropriate level is maintained.

11. Adjust the ATF level. (See [AUTOMATIC TRANSMISSION FLUID \(ATF\) LEVEL ADJUSTMENT \[SJ6A-EL\]](#).)

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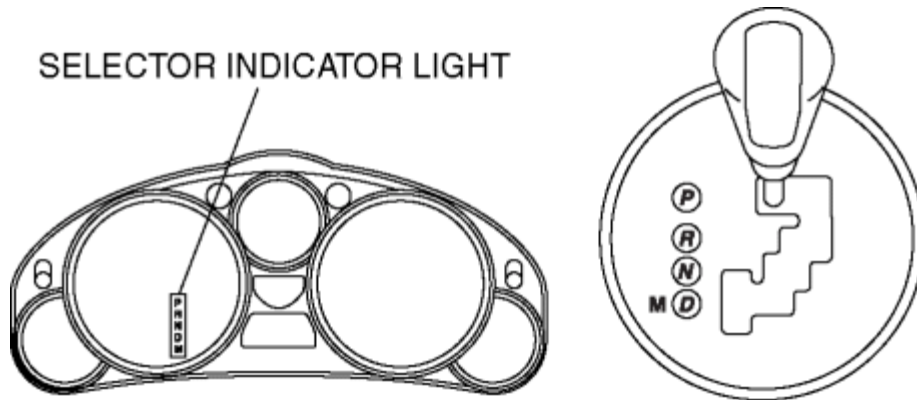
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## 2008 - MX-5 - Transmission/Transaxle

### TRANSMISSION RANGE (TR) SWITCH INSPECTION [SJ6A-EL]

#### Operating inspection

1. Verify that the starter operates only when the ignition switch is turned to the START position with the selector lever in the P or N position.
  - If there is any malfunction, adjust the TR switch. (See [TRANSMISSION RANGE \(TR\) SWITCH ADJUSTMENT \[SJ6A-EL\]](#).)
2. Verify that the back-up lights illuminate when shifted to the R position with the ignition switch at the ON position.
  - If there is any malfunction, adjust the TR switch. (See [TRANSMISSION RANGE \(TR\) SWITCH ADJUSTMENT \[SJ6A-EL\]](#).)
3. Verify that the positions of the selector lever and the indicator are aligned.



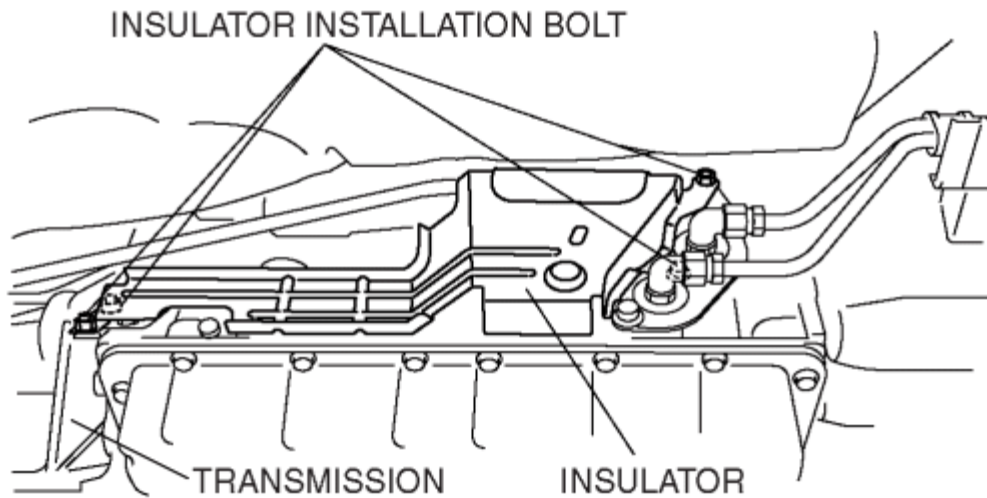
- If there is any malfunction, adjust the TR switch. (See [TRANSMISSION RANGE \(TR\) SWITCH ADJUSTMENT \[SJ6A-EL\]](#).)

#### Continuity Inspection

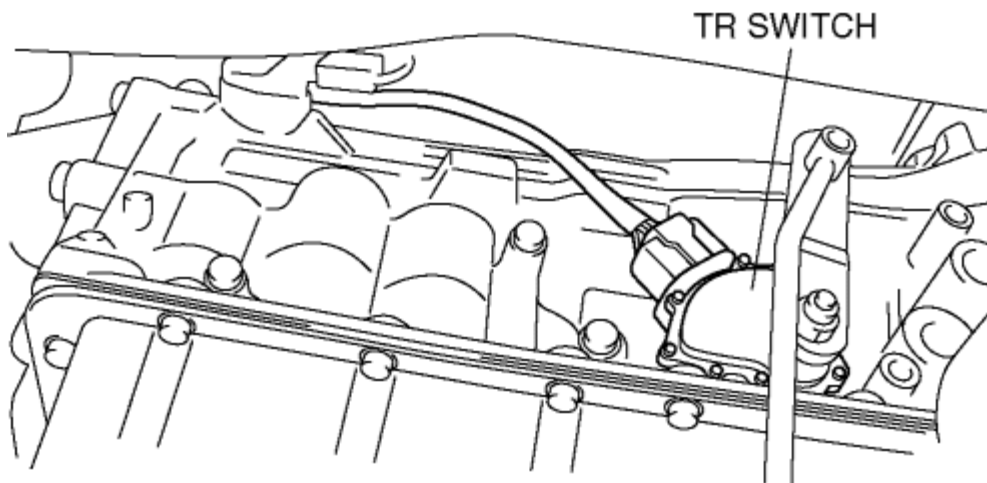
##### CAUTION:

- Water or foreign material entering the connector can cause poor connections or corrosion. Be sure that water or foreign material do not enter the connector when disconnecting it.
1. Remove the battery cover.
  2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
  3. Remove the tunnel member component.
  4. Remove the middle pipe. (See [EXHAUST SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)

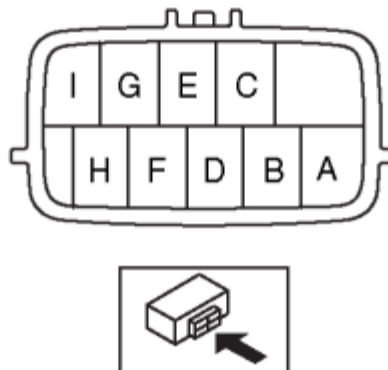
5. Remove the insulator.



6. Disconnect the TR switch connector.



7. Verify that the continuity is as indicated in the table.



- If there is any malfunction, adjust the TR switch. (See **TRANSMISSION RANGE (TR) SWITCH ADJUSTMENT [SJ6A-EL]**.)

○—○ : Continuity

Selector position \ Terminal	Starter circuit		Position-circuit				
	A	I	E	B	C	H	D
P	○—○		○—○				
R			○—○		○		
N	○—○		○—○			○	
D			○—○				○

8. Reinspect for continuity at TR switch.

- If there is any malfunction, replace the TR switch. (See [TRANSMISSION RANGE \(TR\) SWITCH REMOVAL/INSTALLATION \[SJ6A-EL\]](#).)

9. Connect the TR switch connector.

10. Install the insulator.

#### Tightening torque

- 8—11 N·m {82—112 kgf·cm, 72—97 in·lbf}

11. Install the middle pipe. (See [EXHAUST SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)

12. Install the tunnel member component.

13. Connect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)

14. Install the battery cover.

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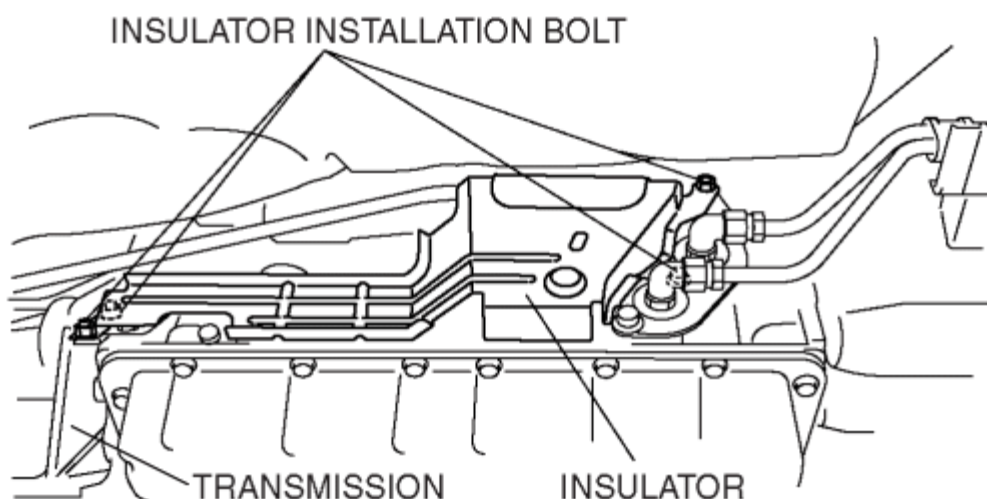
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### TRANSMISSION RANGE (TR) SWITCH ADJUSTMENT [SJ6A-EL]

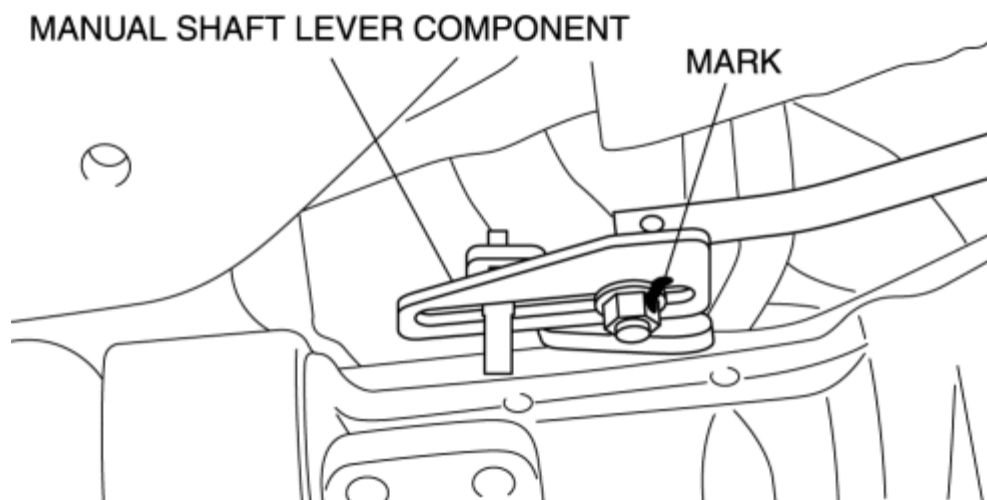
#### CAUTION:

- Water or foreign material entering the connector can cause poor connections or corrosion. Be sure that water or foreign material do not enter the connector when disconnecting it.

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the tunnel member component.
4. Remove the middle pipe. (See [EXHAUST SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
5. Remove the insulator.

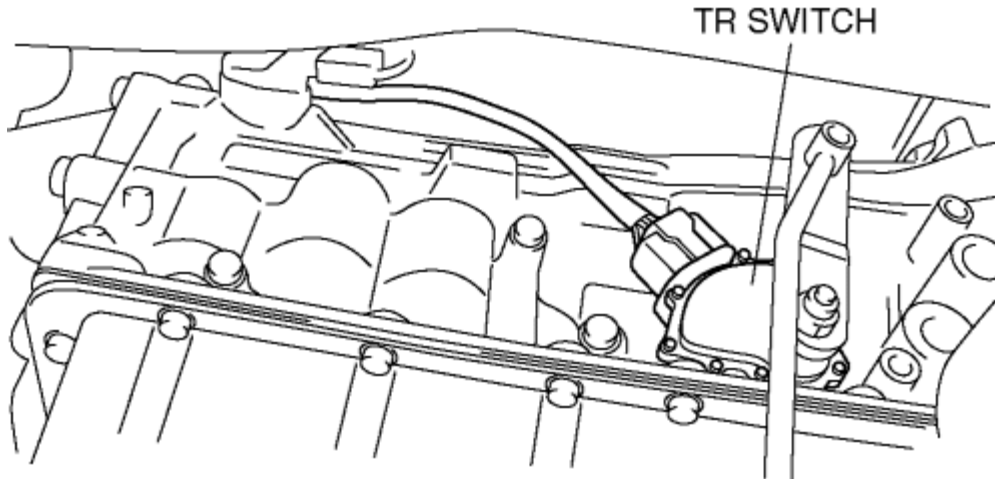


6. Mark the manual shaft lever component as shown in the figure.





7. Separate the manual shaft lever component from selector lever.
8. Disconnect the TR switch connector.

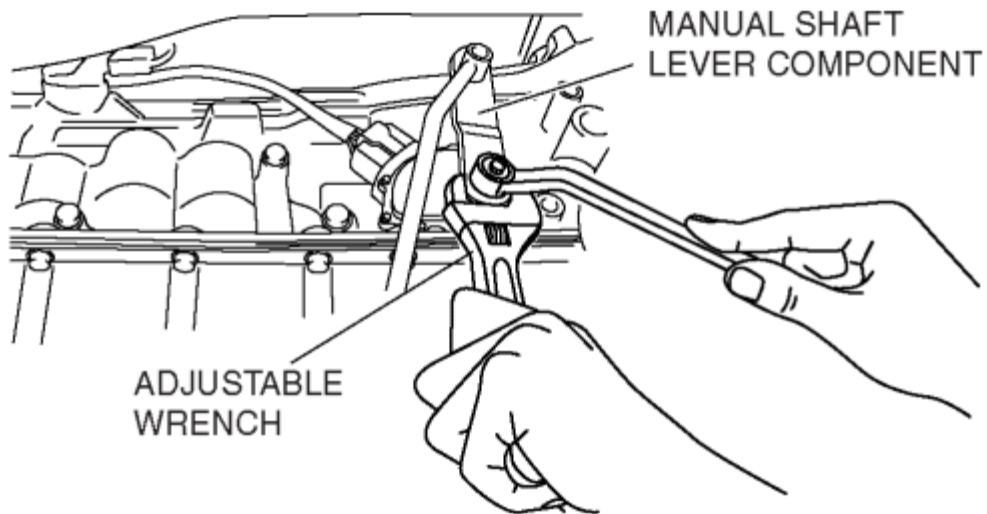


9. Rotate the manual shaft to the N position.

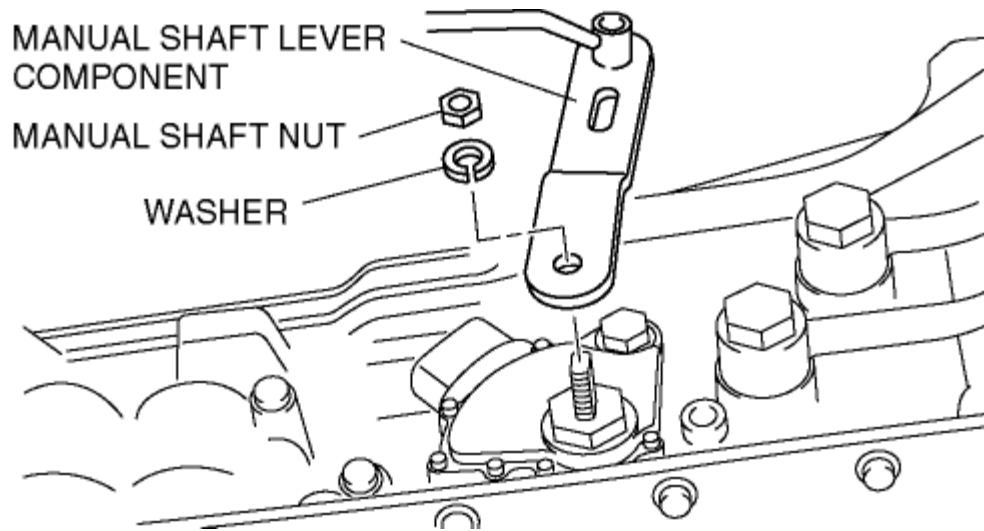
**CAUTION:**

- Do not use an impact wrench. Hold the manual shaft lever when removing the manual shaft nut, otherwise the transmission may be damaged.

10. Set the adjustable wrench as shown in the figure to hold the manual shaft lever.



11. Remove the manual shaft nut.
12. Remove the washer and manual shaft lever component.



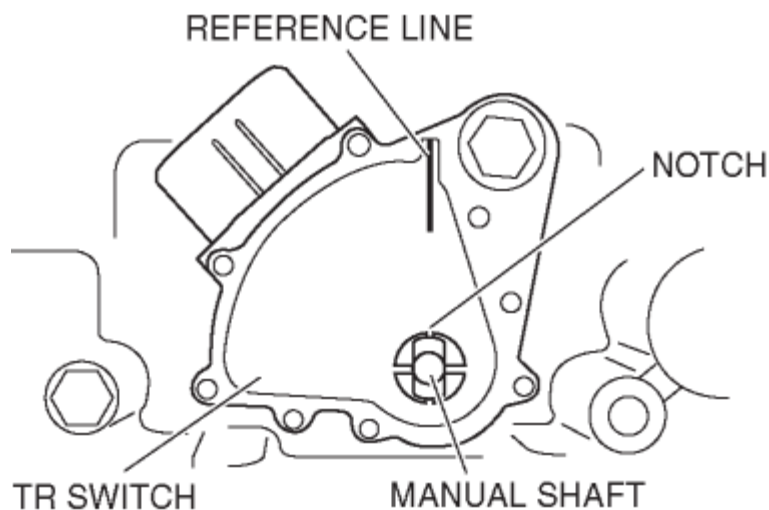
13. Loosen the TR switch mounting bolts.

14. Temporarily install the TR switch mounting bolt.

**CAUTION:**

- Improper adjustment of the TR switch will cause abnormal operation of the automatic transmission. Be sure to adjust the TR switch correctly.

15. Verify the TR switch reference line and the notch of the manual shaft are aligned.

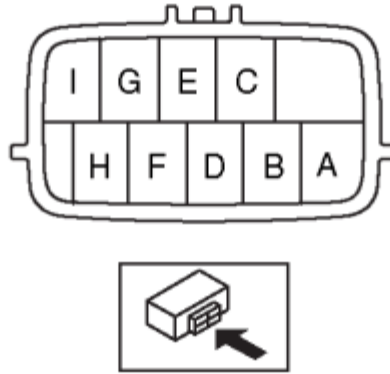


16. Tighten the TR switch mounting bolts.

**Tightening torque**

- 9.8—15.7 N·m {100—160 kgf·cm, 87—138 in·lbf}

17. Inspect for continuity between TR switch terminals E and H.

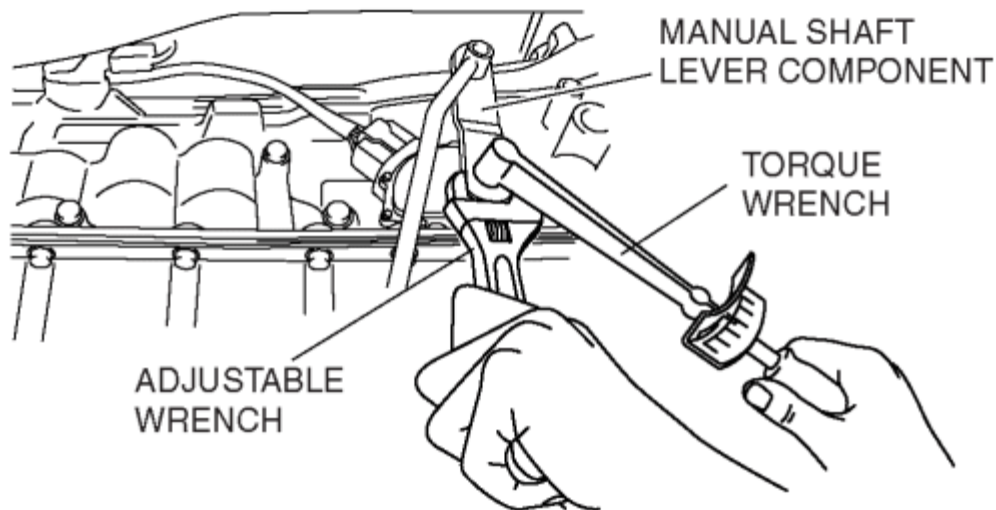


18. Install the manual shift lever component and washer.

**CAUTION:**

- Do not use an impact wrench. Hold the manual shift lever when tightening the manual shaft nut, otherwise the transmission may be damaged.

19. Set the adjustable wrench as shown in the figure to hold the manual shaft lever.



20. Tighten the manual shaft nut using a torque wrench.

**Tightening torque**

- 14—18 N·m { 1.5—1.8 kgf·m, 11—13 ft·lbf }

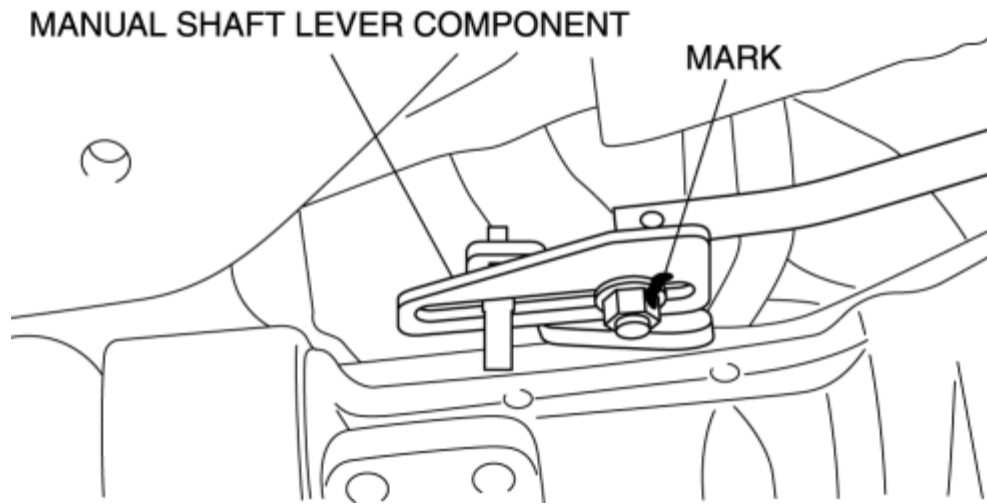
21. Shift the selector lever to P position.

22. Turn the manual shaft lever to P position.

23. Inspect TR switch continuity. (See [TRANSMISSION RANGE \(TR\) SWITCH INSPECTION\[SJ6A-EL\]](#).)

24. Connect the TR switch connector.

25. Align the mark of the manual shaft lever component as shown in the figure.



26. Install the manual shaft lever component installation nut.

**Tightening torque**

- 10.8—14.7 N·m {111—149 kgf·cm, 96.4—129.3 in·lbf}

27. Install the insulator.

**Tightening torque**

- 8—11 N·m {82—112 kgf·cm, 72—97 in·lbf}

28. Install the middle pipe. (See [EXHAUST SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)

29. Install the tunnel member component.

30. Connect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)

31. Install the battery cover.

32. Inspect TR switch operation. (See [TRANSMISSION RANGE \(TR\) SWITCH INSPECTION\[SJ6A-EL\]](#).)

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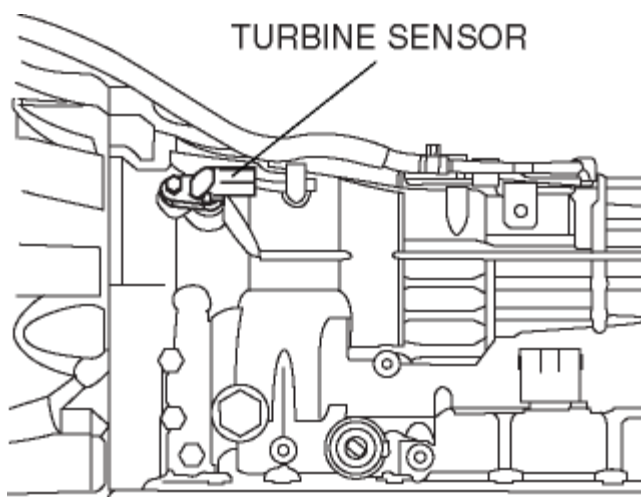
## 2008 - MX-5 - Transmission/Transaxle

### TURBINE SENSOR INSPECTION [SJ6A-EL]

#### CAUTION:

- Water or foreign material entering the connector can cause poor connections or corrosion. Be sure that water or foreign material do not enter the connector when disconnecting it.

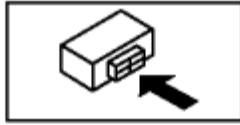
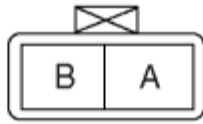
1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Disconnect the turbine sensor connector.



#### CAUTION:

- Do not apply a shock in the turbine sensor.
  - Do not damage the terminals.
4. Measure the resistance between the turbine sensor terminals.

## TURBINE SENSOR



- If there is any malfunction, replace the turbine sensor. (See [TURBINE SENSOR REMOVAL/INSTALLATION \[SJ6A-EL\]](#).)

### **Turbine sensor resistance**

- 560—680 ohm

5. Connect the turbine sensor connector.
6. Connect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
7. Install the battery cover.

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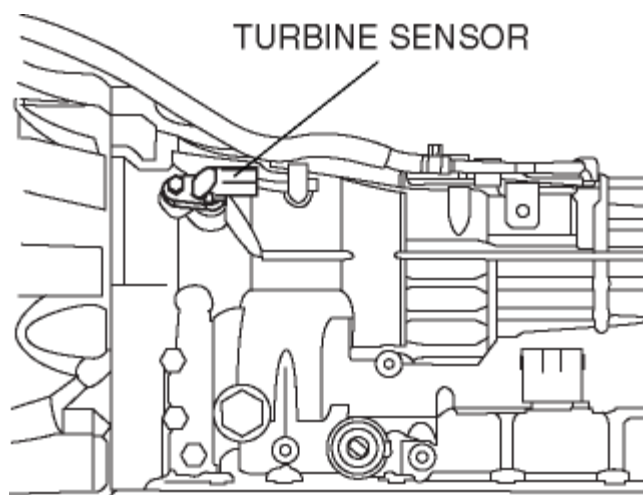
## 2008 - MX-5 - Transmission/Transaxle

### TURBINE SENSOR REMOVAL/INSTALLATION [SJ6A-EL]

#### CAUTION:

- Water or foreign material entering the connector can cause poor connections or corrosion. Be sure that water or foreign material do not enter the connector when disconnecting it.
- Do not damage the turbine sensor.

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Disconnect the turbine sensor connector.
4. Remove the turbine sensor.



5. Install the turbine sensor.

#### Tightening torque

- 3.9—6.9 N·m {40—70 kgf·cm, 35—60 in·lbf}

6. Connect the turbine sensor connector.
7. Connect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
8. Install the battery cover.

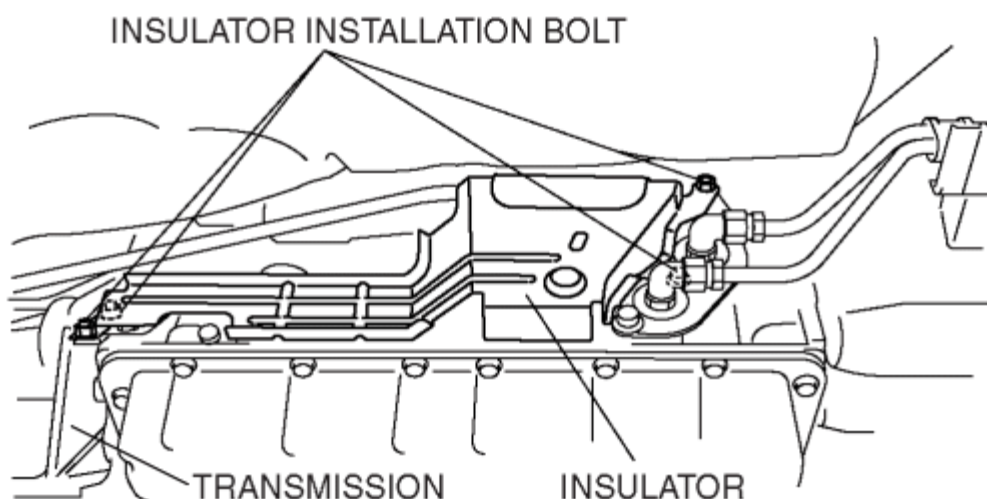
## 2008 - MX-5 - Transmission/Transaxle

### VEHICLE SPEED SENSOR (VSS) INSPECTION [SJ6A-EL]

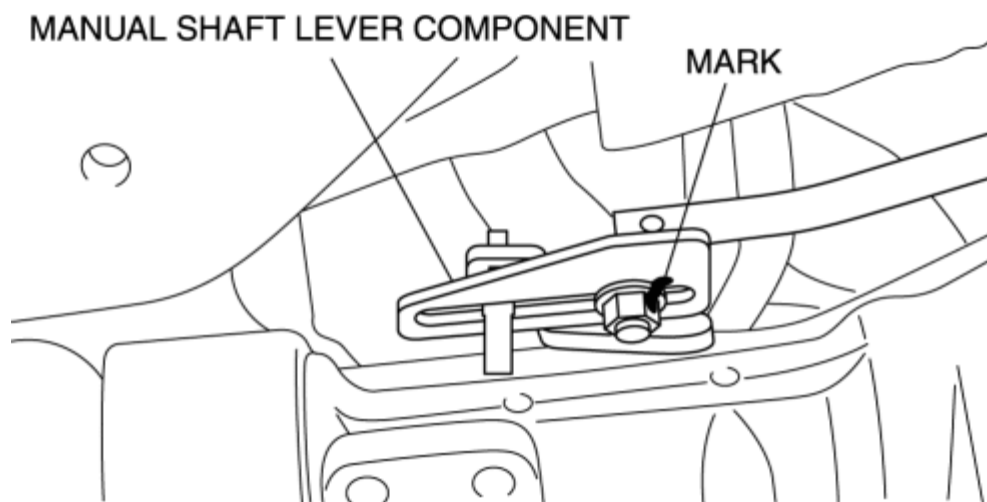
#### CAUTION:

- Water or foreign material entering the connector can cause poor connections or corrosion. Be sure that water or foreign material do not enter the connector when disconnecting it.

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the tunnel member component.
4. Remove the middle pipe. (See [EXHAUST SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
5. Remove the insulator.

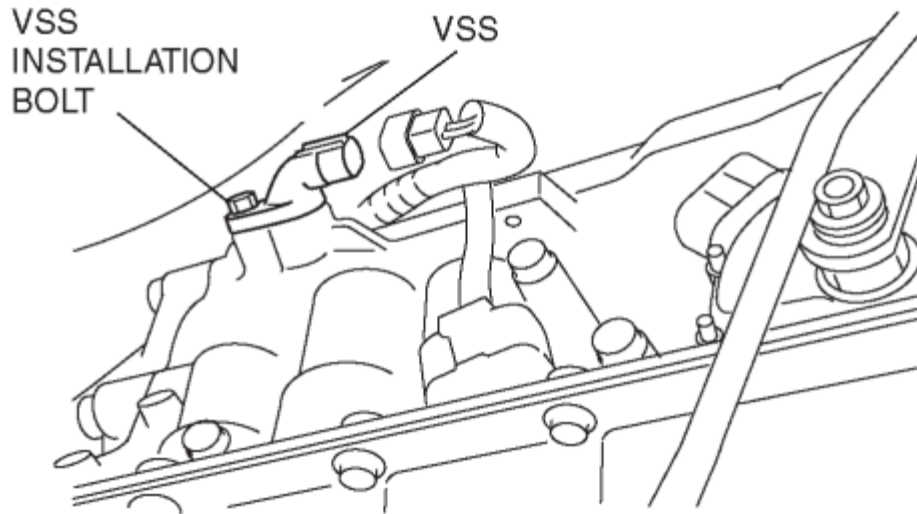


6. Mark the manual shaft lever component as shown in the figure.





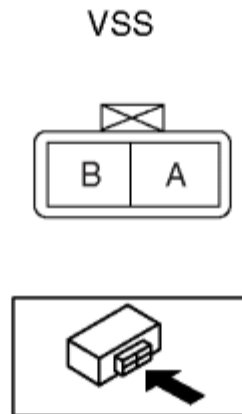
7. Separate the manual shaft lever component from selector lever.
8. Disconnect the VSS connector.



**CAUTION:**

- Do not apply a shock in the VSS.
- Do not damage the terminals.

9. Measure the resistance between the VSS terminals.

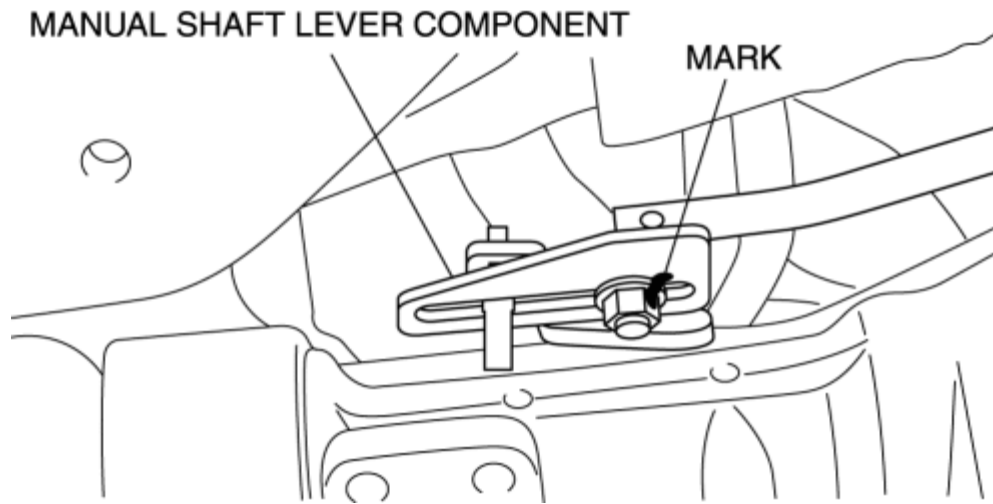


- If there is any malfunction, replace the VSS. (See [VEHICLE SPEED SENSOR \(VSS\) REMOVAL/INSTALLATION \[SJ6A-EL\]](#).)

**VSS resistance**

- 560—680 ohm

10. Connect the VSS connector.
11. Align the mark of the manual shaft lever component as shown in the figure.



12. Install the manual shaft lever component installation nut.

**Tightening torque**

- 10.8—14.7 N·m {111—149 kgf·cm, 96.4—129.3 in·lbf}

13. Install the insulator.

**Tightening torque**

- 8—11 N·m {82—112 kgf·cm, 72—97 in·lbf}

14. Install the middle pipe. (See [EXHAUST SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)

15. Install the tunnel member component.

16. Connect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)

17. Install the battery cover.

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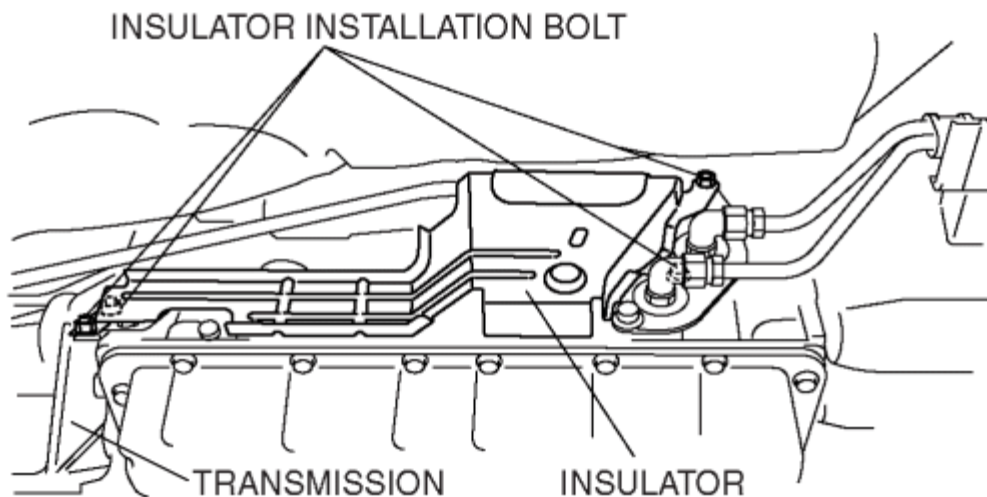
## 2008 - MX-5 - Transmission/Transaxle

### VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION [SJ6A-EL]

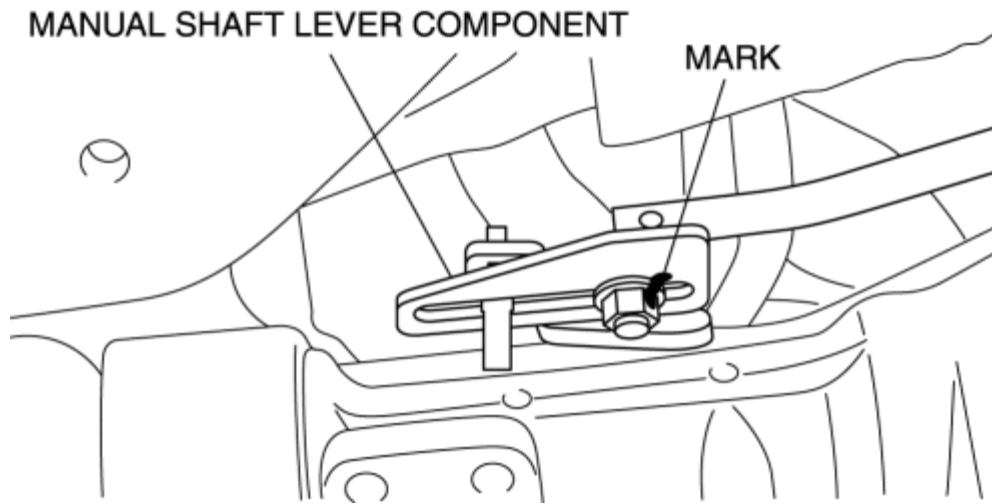
#### CAUTION:

- Water or foreign material entering the connector can cause poor connections or corrosion. Be sure that water or foreign material do not enter the connector when disconnecting it.
- Do not damage the VSS.

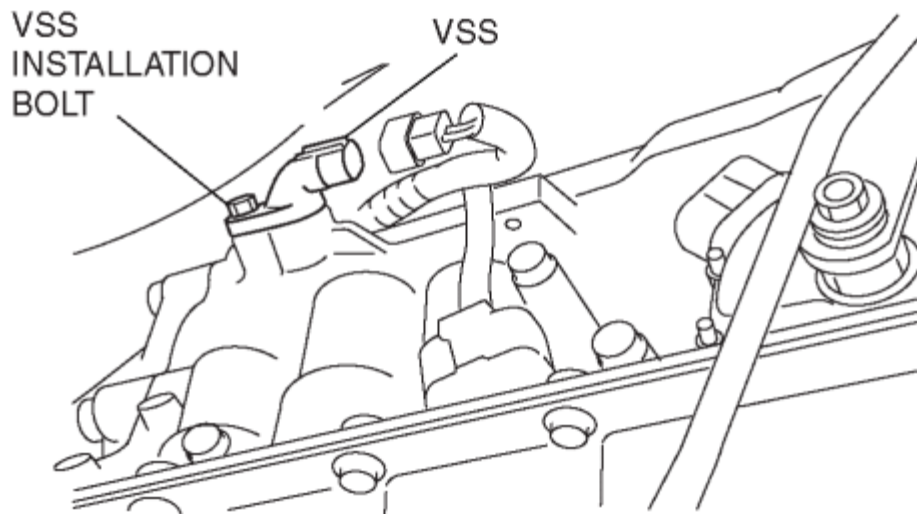
1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the tunnel member component.
4. Remove the middle pipe. (See [EXHAUST SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
5. Remove the insulator.



6. Mark the manual shaft lever component as shown in the figure.



7. Separate the manual shaft lever component from the selector lever.
8. Disconnect the VSS connector.
9. Remove the VSS.

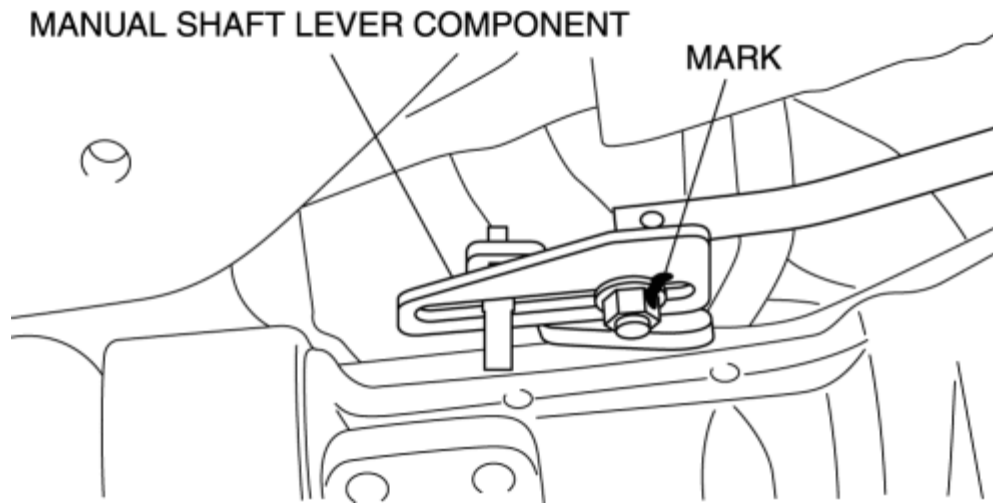


10. Install the VSS.

**Tightening torque**

- 3.9—6.9 N·m { 40—70 kgf·cm, 35—60 in·lbf }

11. Connect the VSS connector.
12. Align the mark of the manual shaft lever component as shown in the figure.



13. Install the manual shaft lever component installation nut.

14. Install the insulator.

**Tightening torque**

- 8—11 N·m {82—112 kgf·cm, 72—97 in·lbf}

15. Install the middle pipe. (See [EXHAUST SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)

16. Install the tunnel member component.

17. Connect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)

18. Install the battery cover.

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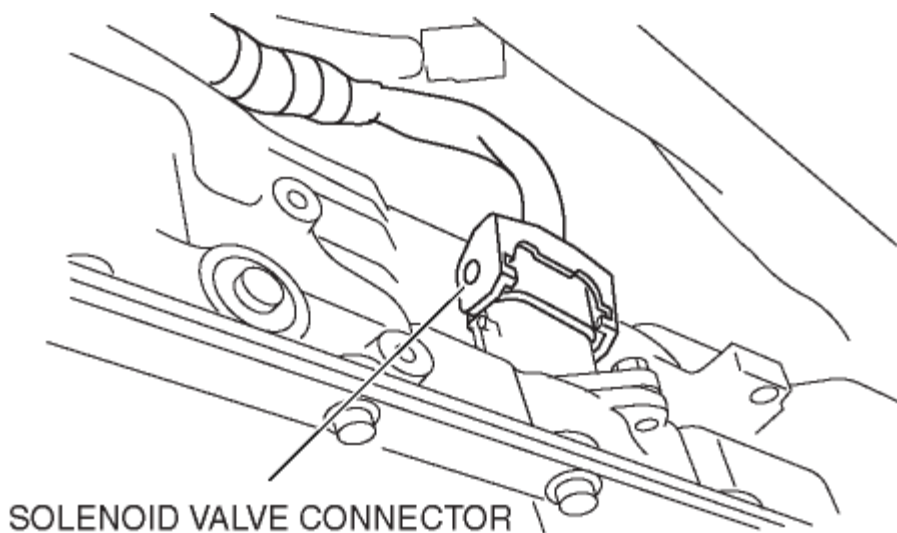
### SOLENOID VALVE INSPECTION [SJ6A-EL]

#### CAUTION:

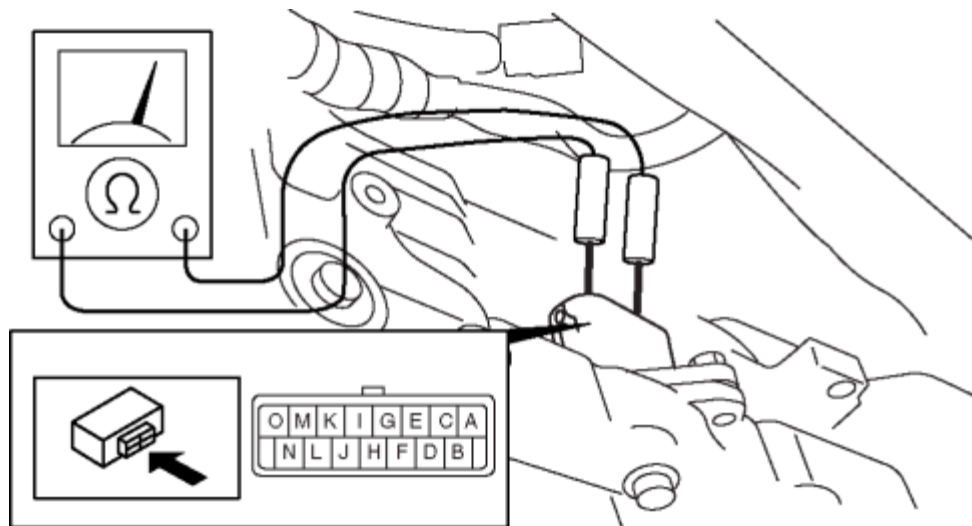
- Water or foreign material entering the connector can cause poor connections or corrosion. Be sure that water or foreign material do not enter the connector when disconnecting it.
- Do not damage the terminals.

#### Resistance inspection (On-vehicle)

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Disconnect the solenoid valve connector.



4. Measure the resistance between the following terminals.



- If there is any malfunction, inspect the coupler component.
- If the coupler component is normal, replace the control valve body. (See [CONTROL VALVE BODY REMOVAL \[SJ6A-EL\].](#)) (See [CONTROL VALVE BODY INSTALLATION \[SJ6A-EL\].](#))

#### Solenoid valve resistance (ATF temperature: 20 °C {68 °F})

Terminals	Solenoid valve	Resistance (ohm)
O—GND	Shift solenoid A	5.0—5.6
N—GND	Shift solenoid B	5.0—5.6
M—GND	Shift solenoid C	5.0—5.6
L—GND	Shift solenoid D	5.0—5.6
K—GND	Shift solenoid E	5.0—5.6
E—F	Shift solenoid F	5.0—5.6
C—D	Shift solenoid G	5.0—5.6
I—J	Line pressure control solenoid	5.0—5.6
G—H	TCC control solenoid	5.0—5.6

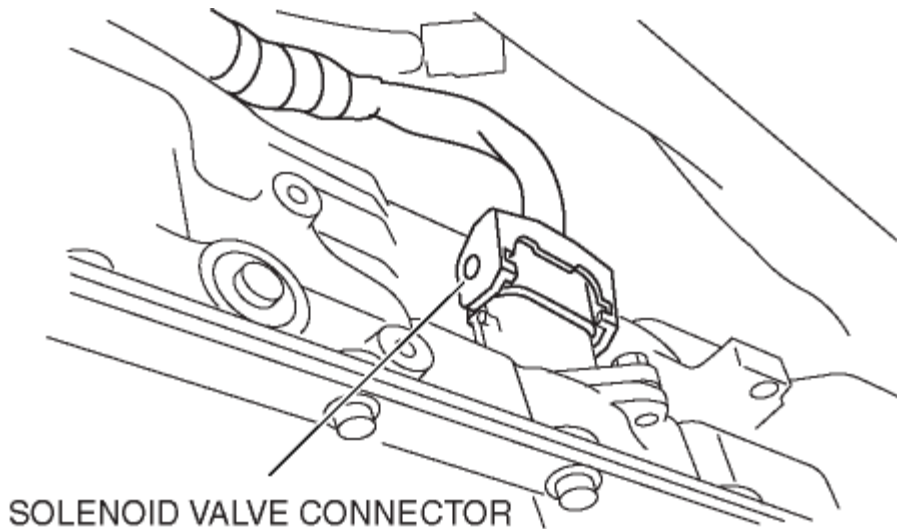
5. Connect the solenoid valve connector.
6. Connect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
7. Install the battery cover.

## Continuity Inspection (On-Vehicle Inspection)

### CAUTION:

- Water or foreign material entering the connector can cause a poor connection or corrosion. Be sure not to allow water or foreign material on the connector when disconnecting.
- Do not damage the terminals.

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Disconnect the solenoid valve connector.



4. Verify that there is no continuity between coupler component terminals C, D, E, F, G, H, I, J and GND.
  - If there is any malfunction, inspect the coupler component.
  - If the coupler component is normal, replace the control valve body. (See [CONTROL VALVE BODY REMOVAL \[SJ6A-EL\].](#)) (See [CONTROL VALVE BODY INSTALLATION \[SJ6A-EL\].](#))
5. Connect the solenoid valve connector.
6. Connect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
7. Install the battery cover.

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## 2008 - MX-5 - Transmission/Transaxle

### AUTOMATIC TRANSMISSION FLUID (ATF) LEVEL ADJUSTMENT [SJ6A-EL]

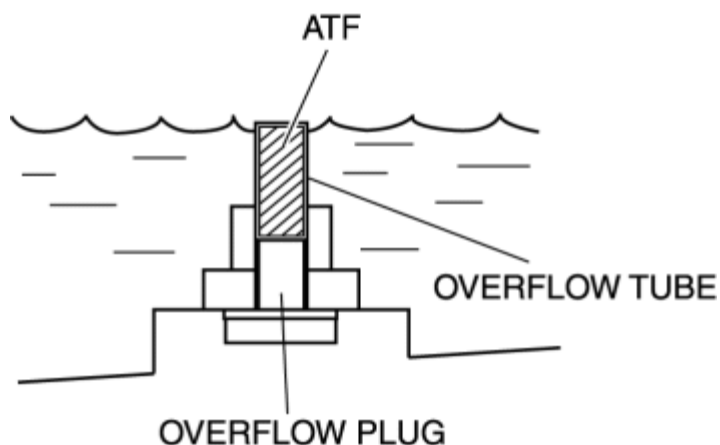
#### Automatic Transmission Fluid (ATF) Level Inspection

##### CAUTION:

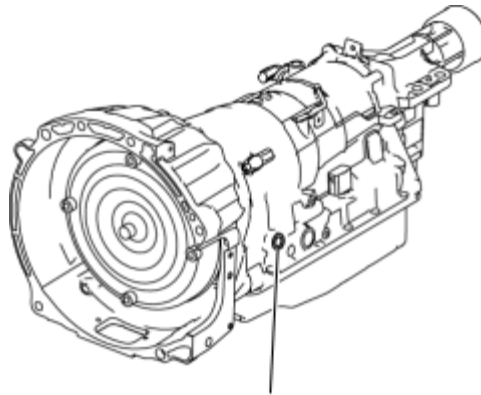
- The ATF level cannot be adjusted correctly if the ATF temperature is not within a normal range (50—60 °C {122—140 °F}). Always perform the servicing according to the adjustment procedure.
- Remaining ATF may drip from the overflow tube even when the ATF level is less than the specified value, therefore careful determination is required.

##### NOTE:

- An overflow-type SJ6A-EL automatic transmission has been adopted with an overflow tube installed to the oil pan for inspection of the ATF level. Therefore, no dipstick has been equipped.



1. Lift up the vehicle.
2. Remove the filler plug and O-ring.



**FILLER PLUG HOLE**

**NOTE:**

- Do not mistake the overflow plug for the drain plug.
3. Remove the overflow plug and the overflow plug gasket.
  4. Fill with ATF from the filler plug hole until it starts flowing from the overflow orifice.

**ATF type**

- ATF JWS3309

**Supplemental ATF amount (approx. quantity)**

Service	Supplemental ATF amount
Procedure including ATF draining <ul style="list-style-type: none"> <li>• Transmission replacement</li> <li>• Torque converter replacement</li> <li>• Oil cooler replacement</li> <li>• Control valve body replacement</li> <li>• TFT sensor replacement</li> </ul>	Fill ATF to the specified amount (approx. quantity: 7.4 L { 7.8 US qt, 6.5 Imp qt})
Procedure without ATF draining <ul style="list-style-type: none"> <li>• Oil seal (extension housing) replacement</li> <li>• Fixing oil leakage or stains</li> </ul>	Add small amount of ATF

**NOTE:**

Replace the O-ring if it has malfunction.

5. Coat a new O-ring with ATF, and install it to the filler plug.

#### **Tightening torque**

- 23.5—54.9 N·m {2.4—5.5 kgf·m, 17.4—40.4 ft·lbf}

6. Temporarily tighten the overflow plug.

7. Start the engine and warm it up by idling to increase the ATF temperature.

#### **NOTE:**

- Perform the following procedure quickly, otherwise, the ATF temperature will exceed the proper range.

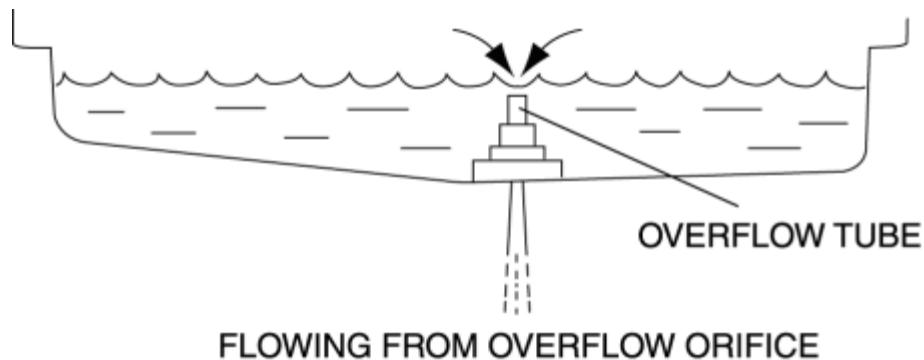
8. Shift to all ranges, from the P position to the D range, taking **2 s or more** for each position or range, then after repeating the procedure two times, shift to the P position again.

#### **CAUTION:**

- Do not shift from the N position when the AT warning light is illuminated.

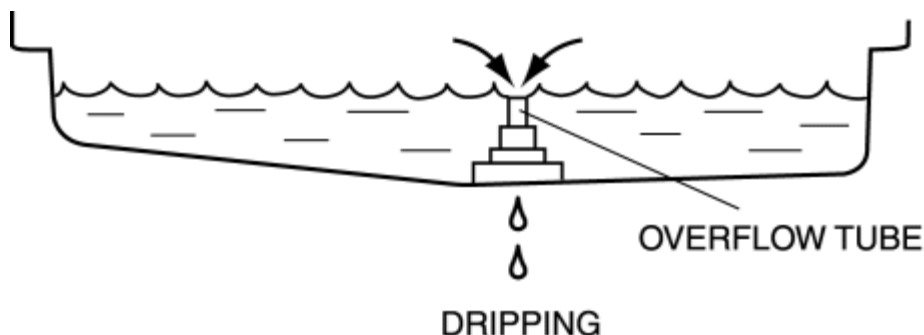
9. Verify that the ATF temperature is in the proper range (**50—60 °C {122—140 °F}**). (See [Using the M-MDS.](#))(See [Using the AT warning light.](#))

10. Remove the overflow plug and inspect whether the ATF is flowing from the overflow orifice with the transmission in park and engine idling.



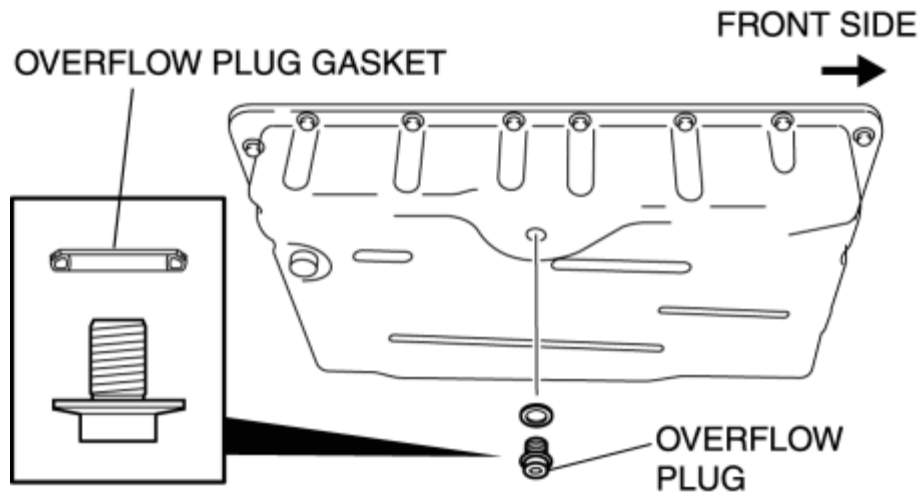
- If there is no ATF flowing, install the overflow plug after the engine is stopped, refill with ATF from the filler plug hole, and repeat the procedure from Step 7.

11. Wait until the ATF starts dripping from the overflow plug.



#### **CAUTION:**

- Be sure to install the overflow plug gasket in the correct direction as shown in the figure.



12. If ATF dripping is verified, install a new overflow plug gasket and overflow plug.

#### **Tightening torque**

- 17.5—22.5 N·m {1.8—2.2 kgf·m, 13.0—16.5 ft·lbf}

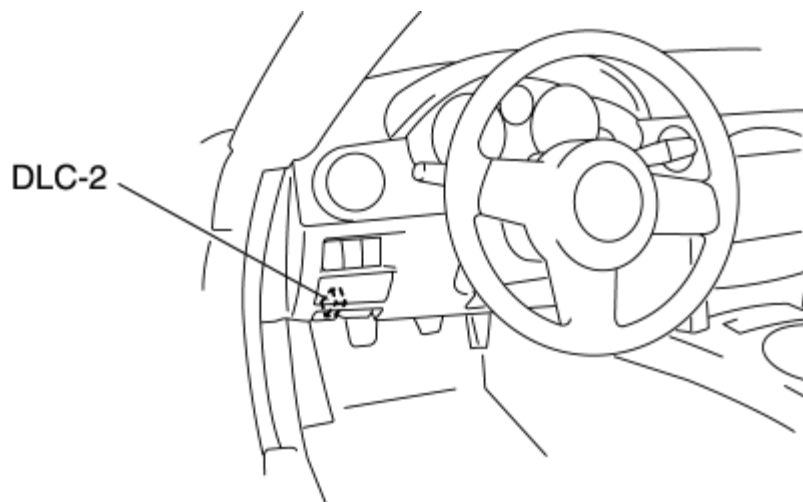
13. Wipe off any ATF drips after tightening the overflow plug.

14. Lower the vehicle.

### **ATF Temperature Verification**

#### **Using the M-MDS**

1. Connect the M-MDS to the vehicle DLC-2.

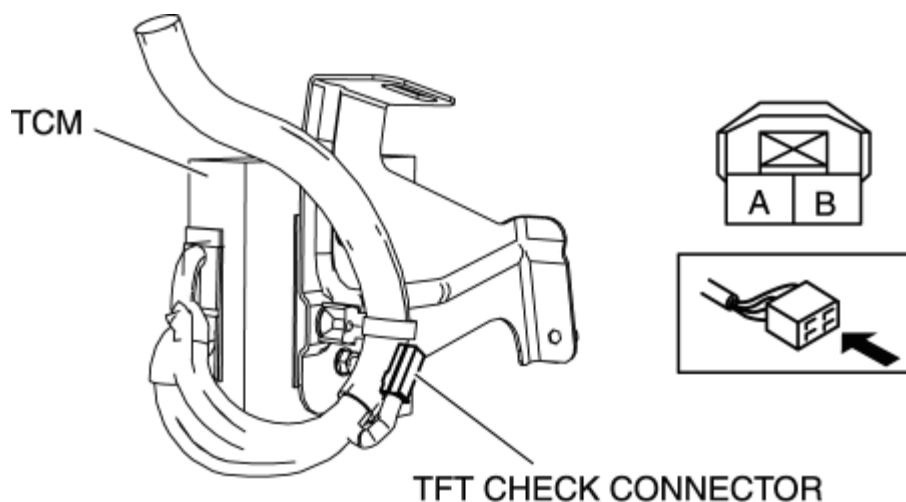


2. Verify the ATF temperature using the PID/data monitor "TFT".

3. Warm up the automatic transmission until the ATF temperature is **50—60 °C {122—140 °F}**.

#### **Using the AT warning light**

1. Short the TFT check connector terminal A and B of the TCM.



2. Perform the following operations to activate the control for the oil level adjustment.

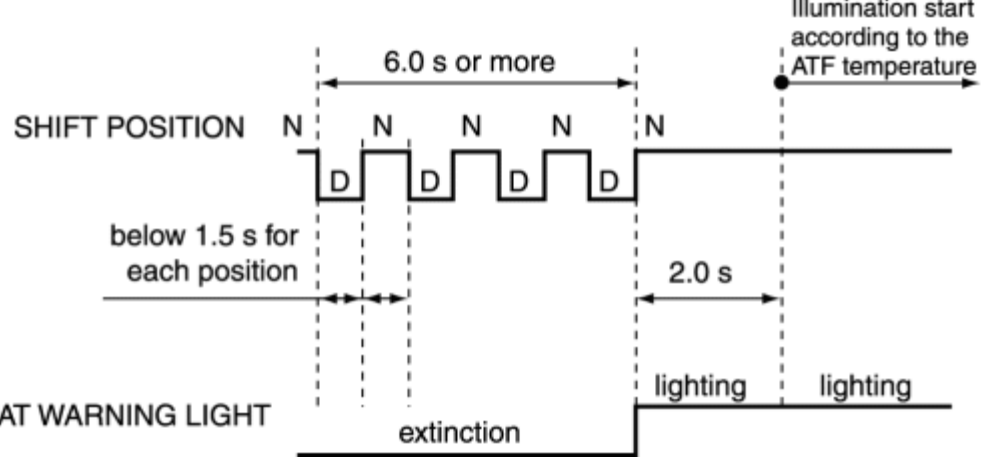
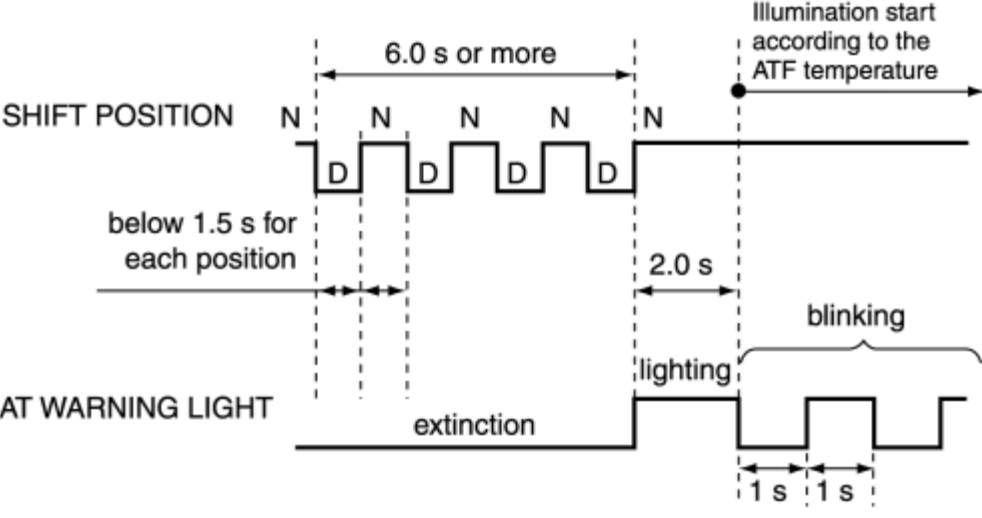
- Continue the shifting operation from N to D, D to N **within 1.5 s** until the AT warning light illuminates.

**NOTE:**

- When adjusting the ATF level, refer to the following chart and verify the specified ATF temperature (**50—60 °C {122—140 °F}**).

**AT warning light illumination chart for ATF level adjustment**

ATF condition	Time chart
<p>ATF Temperature <b>below 50 °C {122 °F}</b></p> <ul style="list-style-type: none"> <li>ATF temperature is lower than a ATF level adjustable temperature.</li> </ul>	<p>SHIFT POSITION</p> <p>AT WARNING LIGHT</p> <p>6.0 s or more</p> <p>below 1.5 s for each position</p> <p>2.0 s</p> <p>lighting</p> <p>extinction</p> <p>extinction</p> <p>Illumination start according to the ATF temperature</p>
<p>ATF Temperature 50—60 °C {122—140 °F}</p> <ul style="list-style-type: none"> <li>ATF temperature is same a ATF level</li> </ul>	

<p>adjustable temperature.</p>	 <p>SHIFT POSITION N D N D N D N D N</p> <p>6.0 s or more</p> <p>below 1.5 s for each position</p> <p>AT WARNING LIGHT extinction lighting 2.0 s</p> <p>Illumination start according to the ATF temperature</p>
<p>ATF Temperature <b>above 60 °C {140 °F}</b></p> <ul style="list-style-type: none"> <li>ATF temperature is higher than a ATF level adjustable temperature.</li> </ul>	 <p>SHIFT POSITION N D N D N D N D N</p> <p>6.0 s or more</p> <p>below 1.5 s for each position</p> <p>AT WARNING LIGHT extinction lighting 2.0 s</p> <p>blinking 1 s 1 s</p> <p>Illumination start according to the ATF temperature</p>

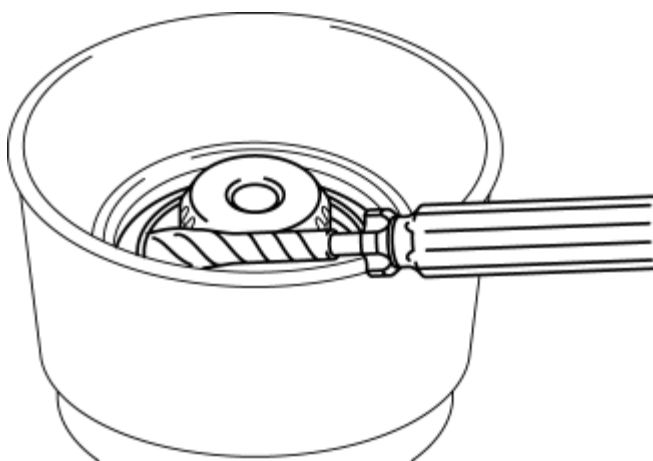
## 2008 - MX-5 - Transmission/Transaxle

### OIL SEAL (EXTENSION HOUSING) REPLACEMENT [SJ6A-EL]

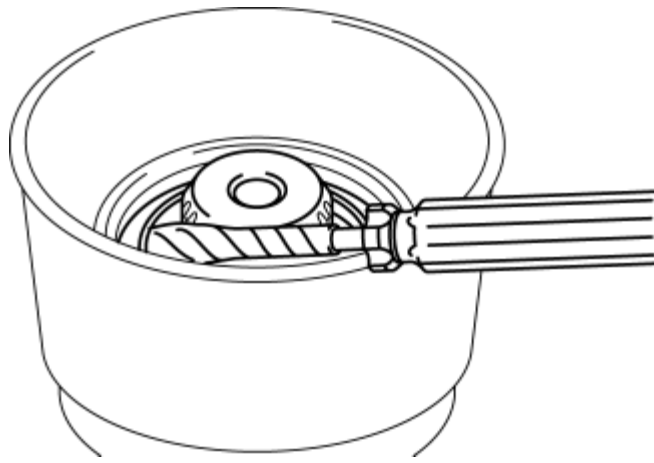
1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Clean the transmission exterior thoroughly using a steam cleaner or cleaning solvent.
4. Drain the ATF. (See [AUTOMATIC TRANSMISSION FLUID \(ATF\) REPLACEMENT \[SJ6A-EL\].](#))
5. Remove the following parts.
  - a. Tunnel member component
  - b. Middle pipe (See [EXHAUST SYSTEM REMOVAL/INSTALLATION \[LF\].](#))
  - c. Propeller shaft (See [PROPELLER SHAFT REMOVAL/INSTALLATION.](#))

#### CAUTION:

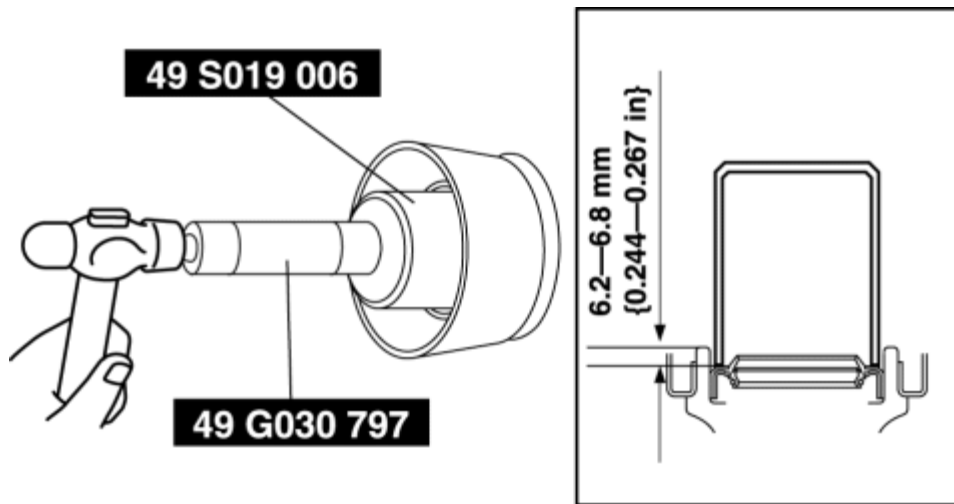
- Do not to damage the extension dust deflector.
  - Do not to damage the extension housing.
6. Remove the extension housing shroud using a tape-wrapped flathead screwdriver.



7. Remove the oil seal (extension housing) using a tape-wrapped flathead screwdriver.

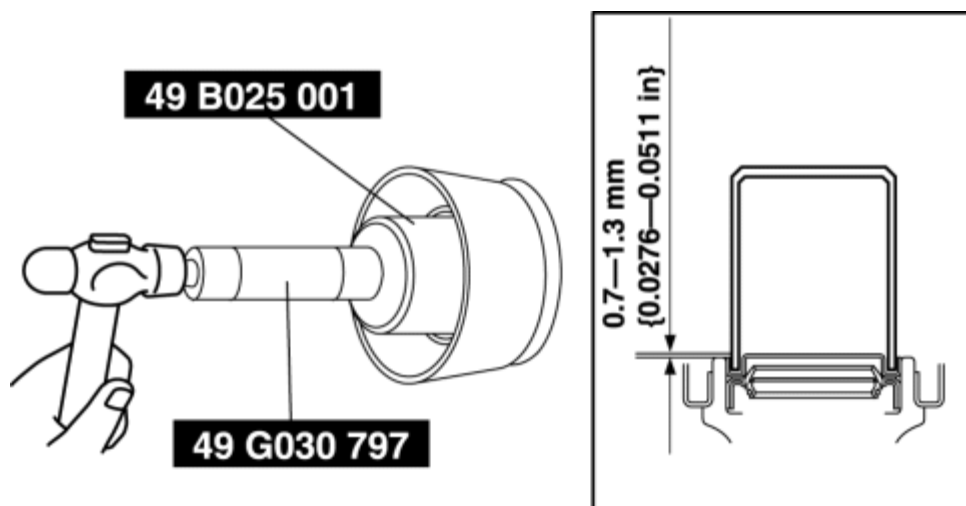


8. Using the **SST** and a hammer, install the new oil seal to the extension housing.



9. Coat the oil seal lip with grease.

10. Using the **SST** and a hammer, install the new extension housing shroud to the extension housing.



11. Install the following parts.

- a. Propeller shaft (See [PROPELLER SHAFT REMOVAL/INSTALLATION.](#))
- b. Middle pipe (See [EXHAUST SYSTEM REMOVAL/INSTALLATION \[LF\].](#))



c. Tunnel member component

12. Add ATF and, with the engine idling, inspect the ATF level and for leakage. (See [AUTOMATIC TRANSMISSION FLUID \(ATF\) LEVEL ADJUSTMENT \[SJ6A-EL\]](#).)
13. Connect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
14. Install the battery cover.

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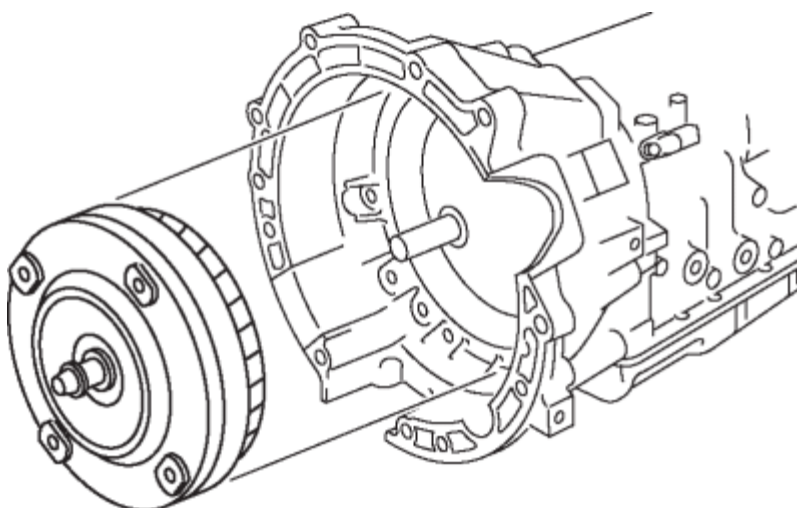
### TORQUE CONVERTER REMOVAL/INSTALLATION [SJ6A-EL]

1. Remove the transmission. (See [AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION \[SJ6A-EL\]](#).)

#### CAUTION:

- The oil seal is easily damaged by the sharp edges of the torque converter splines. Do not let the splines contact the oil seal.
- Do not drop the torque converter.
- Do not pinch fingers.

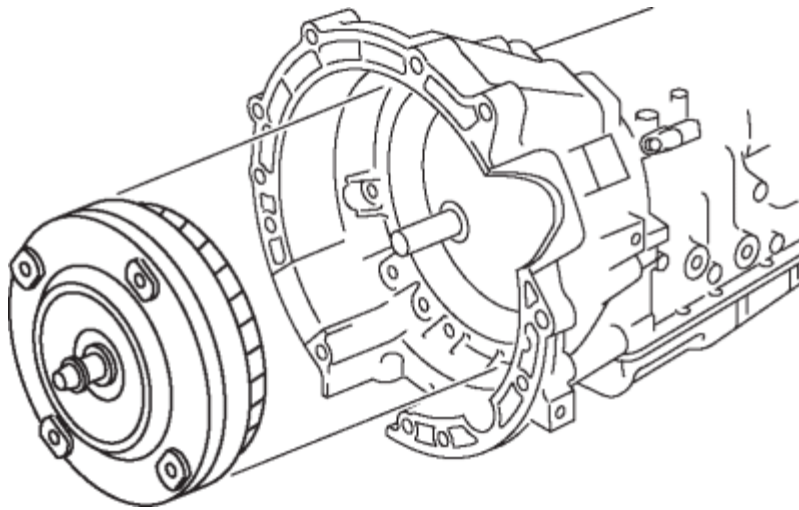
2. Remove the torque converter, and immediately turn it so that the hole faces upward. This will help to keep any remaining ATF from spilling.



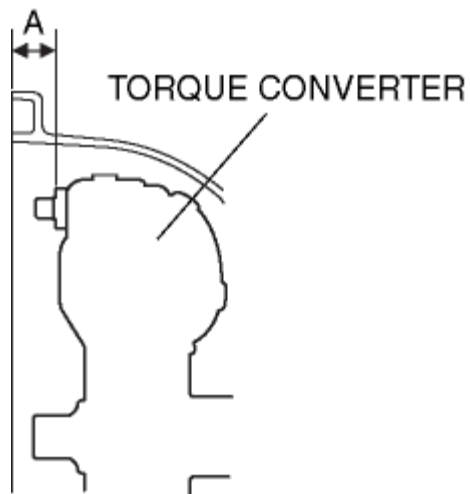
3. Drain any ATF remaining in the torque converter.

4. Using a flathead screwdriver, position the drive gear on the oil pump component in the center.

5. Install the torque converter to the transmission.



6. To ensure that the torque converter is installed accurately, measure distance A between the end of the torque converter and the end of the converter housing.



**Distance A between end of torque converter and face of converter housing**

- 26.2 mm {1.03 in}

7. Install the automatic transmission. (See [AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION \[SJ6A-EL\]](#).)

8. Perform the mechanical system test. (See [MECHANICAL SYSTEM TEST \[SJ6A-EL\]](#).)

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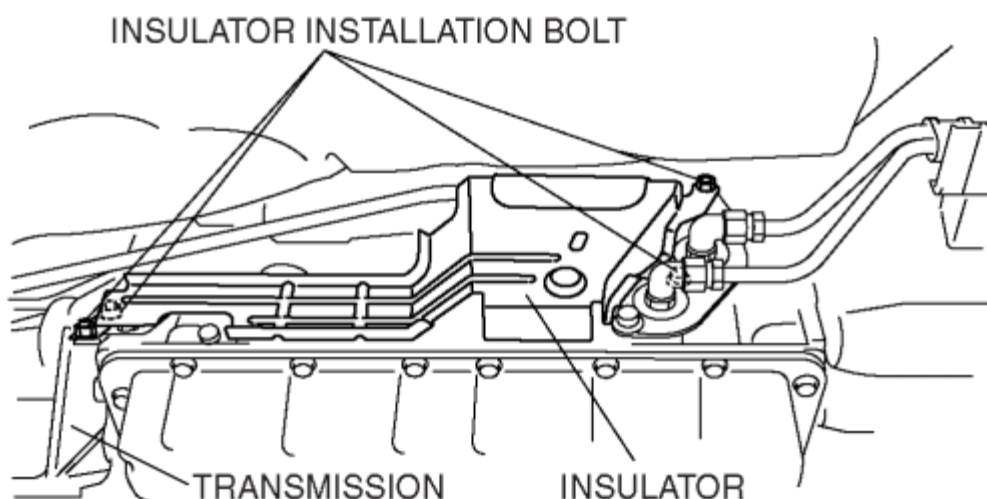
## 2008 - MX-5 - Transmission/Transaxle

### TRANSMISSION RANGE (TR) SWITCH REMOVAL/INSTALLATION [SJ6A-EL]

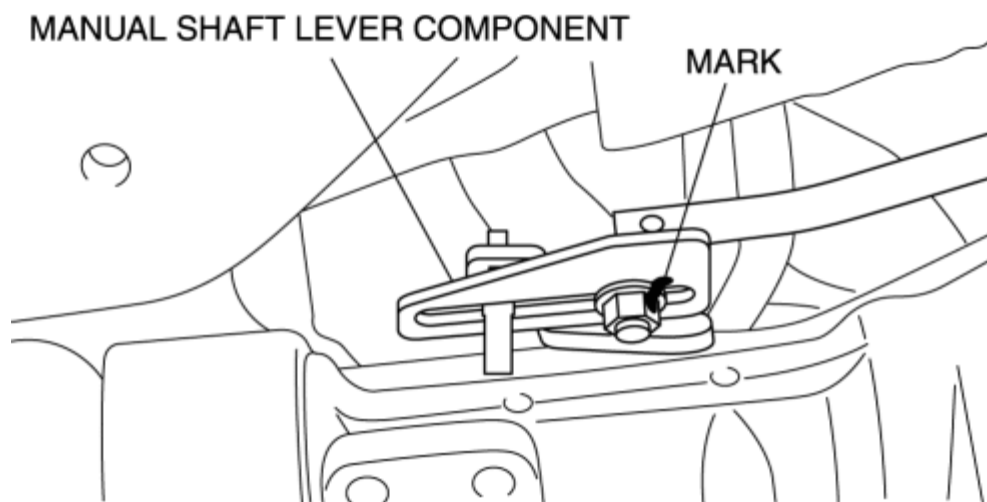
#### CAUTION:

- Water or foreign material entering the connector can cause poor connections or corrosion. Be sure that water or foreign material do not enter the connector when disconnecting it.

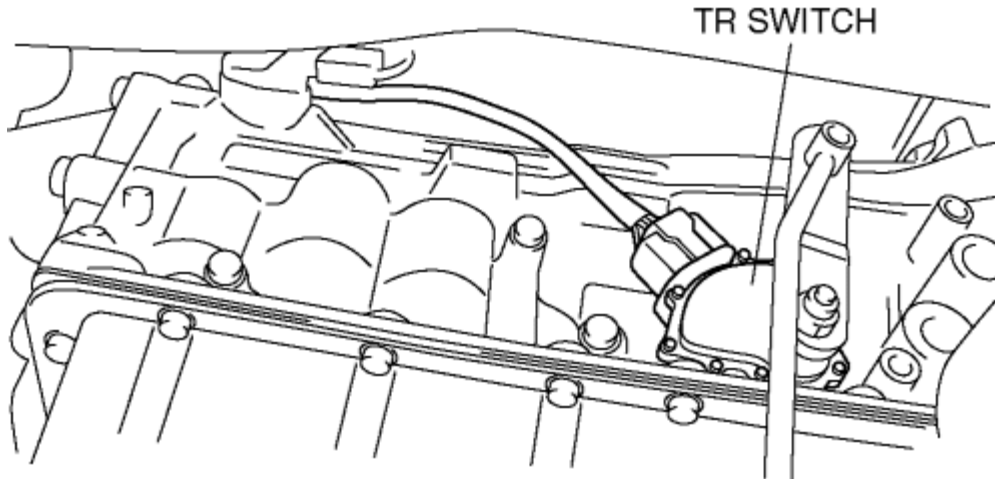
1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the tunnel member component.
4. Remove the middle pipe. (See [EXHAUST SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
5. Remove the insulator.



6. Mark the manual shaft lever component as shown in the figure.



7. Separate the manual shaft lever component from selector lever.
8. Disconnect the TR switch connector.

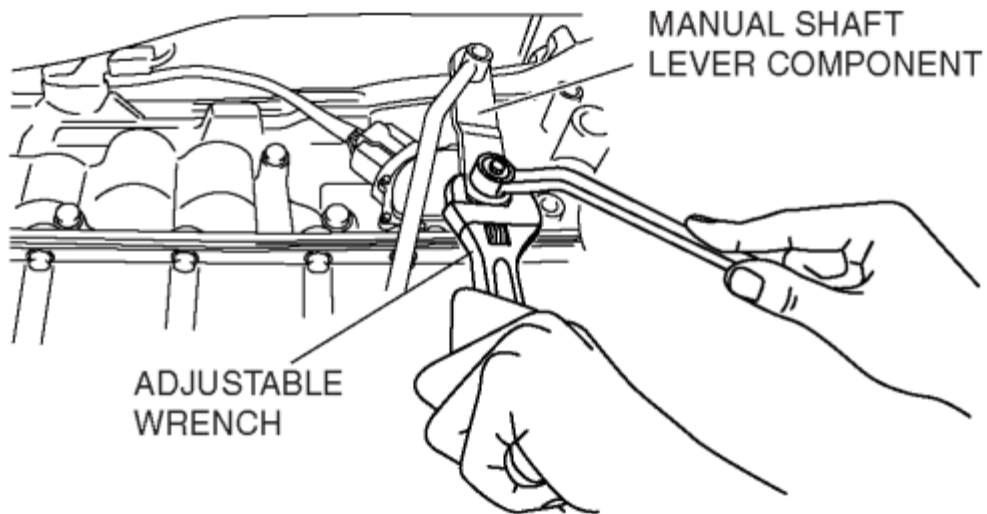


9. Rotate the manual shaft to the N position.

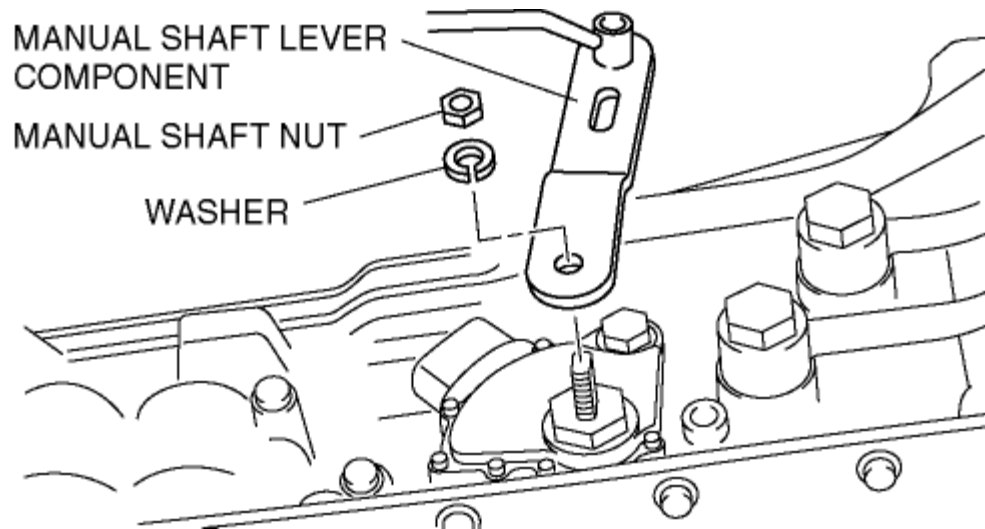
**CAUTION:**

- Do not use an impact wrench. Hold the manual shaft lever when removing the manual shaft nut, otherwise the transmission may be damaged.

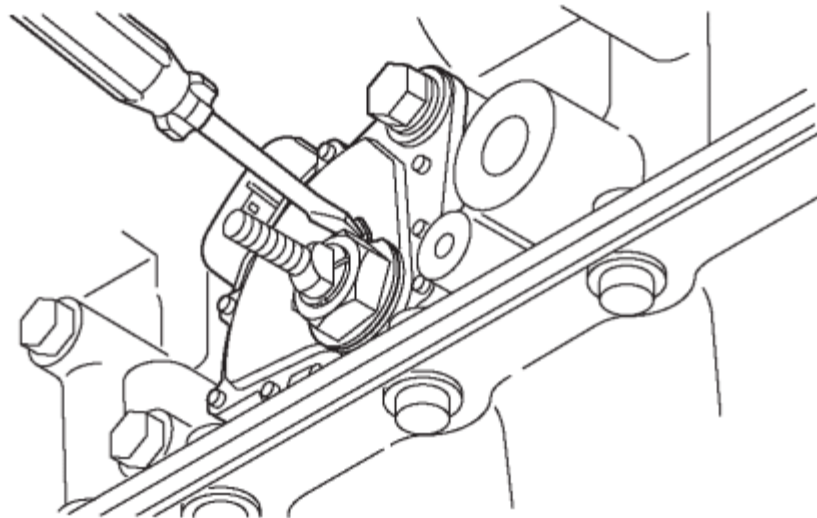
10. Set the adjustable wrench as shown in the figure to hold the manual shaft lever.



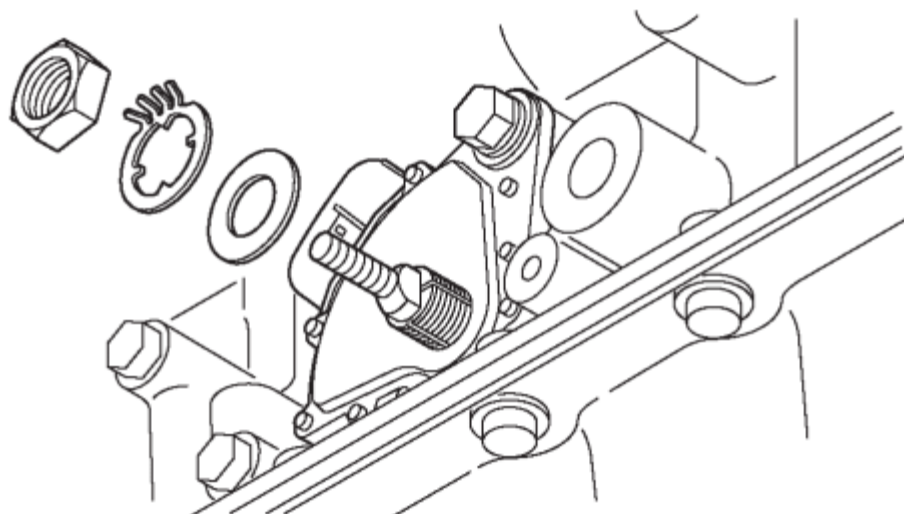
11. Remove the manual shaft nut.
12. Remove the washer and manual shaft lever component.



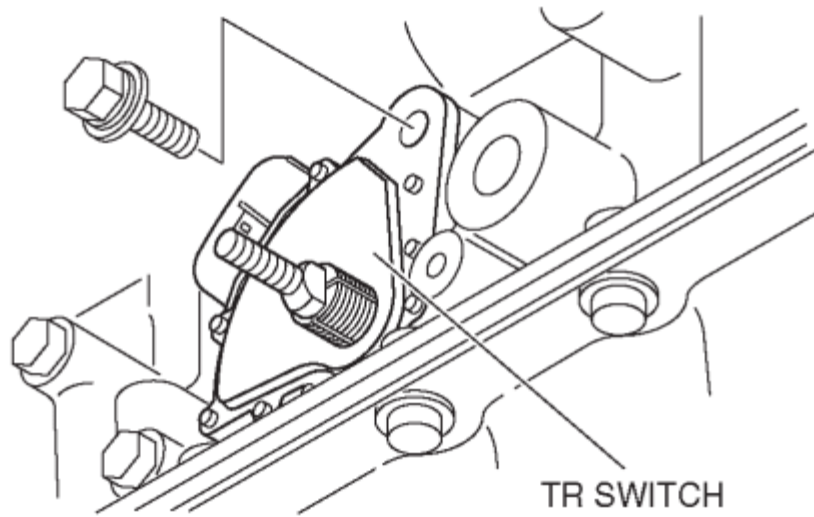
13. Pry off the lock washer using a flathead screwdriver.



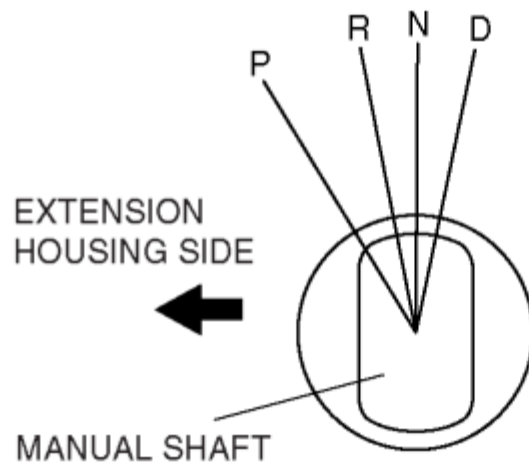
14. Remove the nut, lock washer and the washer.



15. Remove the TR switch.



16. Rotate the manual shaft to the extension housing side fully and return two notches to set the N position.

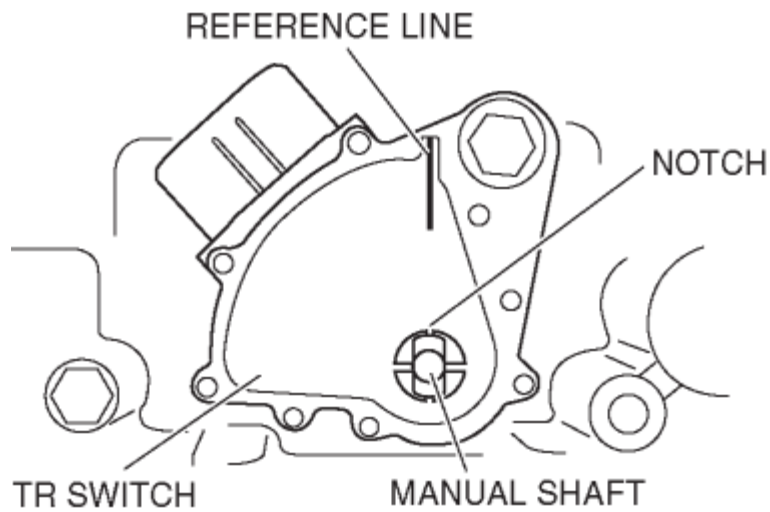


17. Install the TR switch and hand-tighten the new mounting bolts.

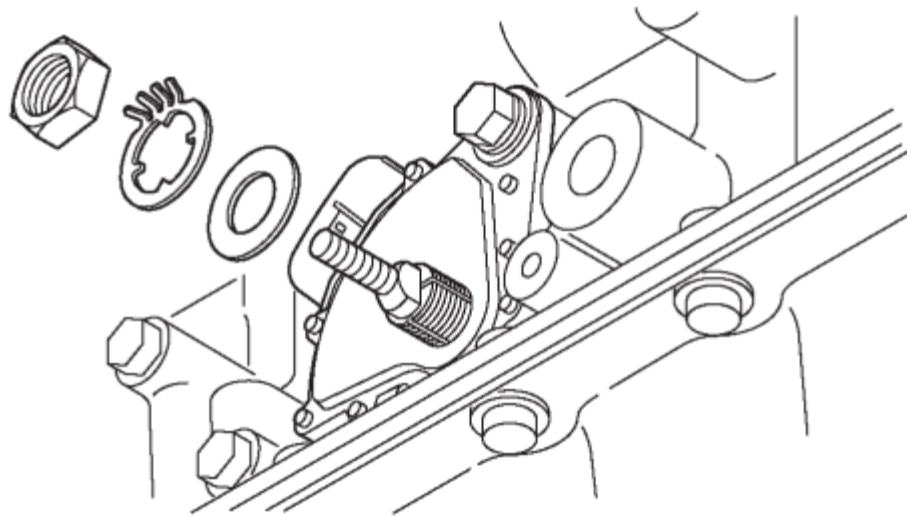
**CAUTION:**

- Improper adjustment of the TR switch will cause abnormal operation of the automatic transmission. Be sure to adjust the TR switch correctly.

18. Verify the TR switch reference line and the notch of the manual shaft are aligned.



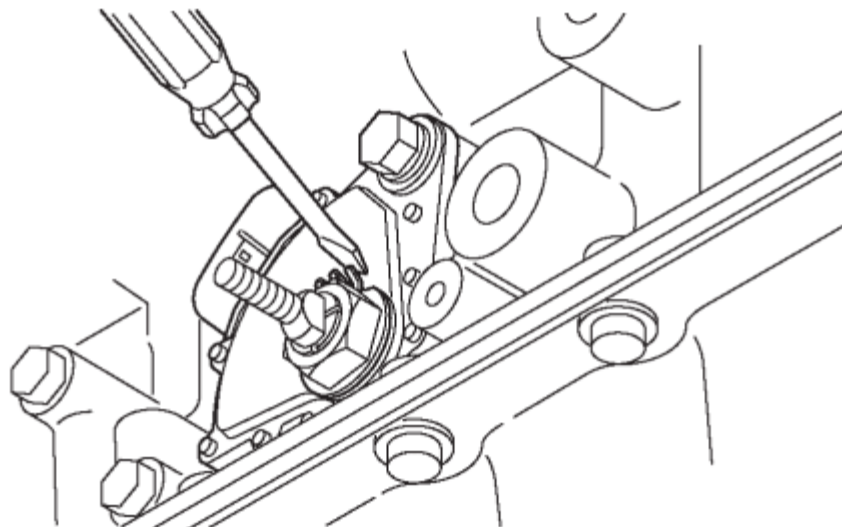
19. Install the washer and the lock washer with the nut.



#### **Tightening torque**

- 5.9—7.8 N·m {61—79 kgf·cm, 53—68 in·lbf}

20. Stake the lock washer using a flathead screwdriver.



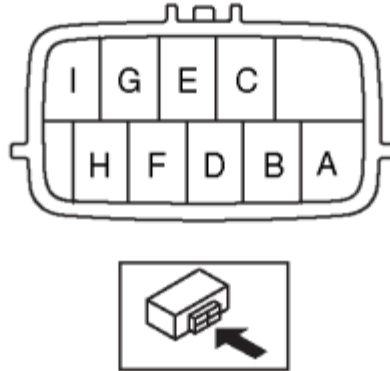
21. Tighten the TR switch mounting bolts.



### Tightening torque

- 9.8—15.7 N·m {100—160 kgf·cm, 87—138 in·lbf}

22. Inspect for continuity between TR switch terminals E and H.

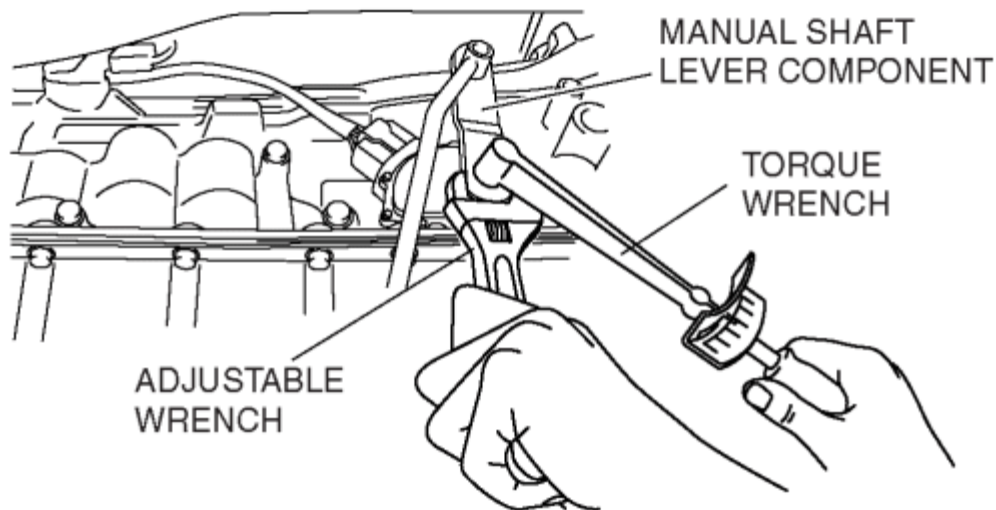


23. Install the manual shaft lever component and washer.

### CAUTION:

- Do not use an impact wrench. Hold the manual shaft lever when tightening the manual shaft nut, otherwise the transmission may be damaged.

24. Set the adjustable wrench as shown in the figure to hold the manual shaft lever.



25. Tighten the manual shaft nut using a torque wrench.

### Tightening torque

- 14—18 N·m {1.5—1.8 kgf·m, 11—13 ft·lbf}

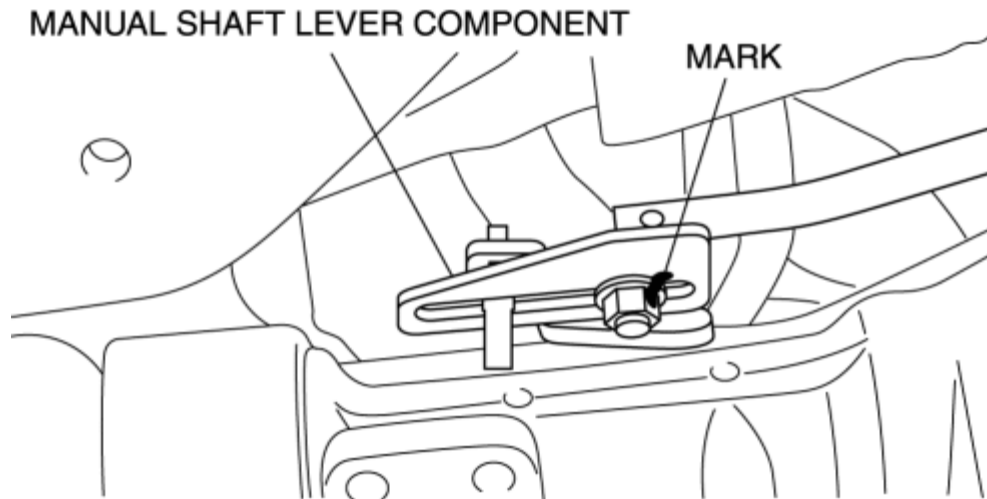
26. Shift the selector lever to the P position.

27. Turn the manual shaft lever to the P position.

28. Inspect TR switch continuity. (See [TRANSMISSION RANGE \(TR\) SWITCH INSPECTION\[SJ6A-EL\]](#).)

29. Connect the TR switch connector.

30. Align the mark of the manual shaft lever component as shown in the figure.



31. Install the manual shaft lever component installation nut.

**Tightening torque**

- 10.8—14.7 N·m {111—149 kgf·cm, 96.4—129.3 in·lbf}

32. Install the insulator.

**Tightening torque**

- 8—11 N·m {82—112 kgf·cm, 72—97 in·lbf}

33. Install the middle pipe. (See [EXHAUST SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)

34. Install the tunnel member component.

35. Connect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)

36. Install the battery cover.

37. Inspect TR switch operation. (See [TRANSMISSION RANGE \(TR\) SWITCH INSPECTION\[SJ6A-EL\]](#).)

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## 2008 - MX-5 - Transmission/Transaxle

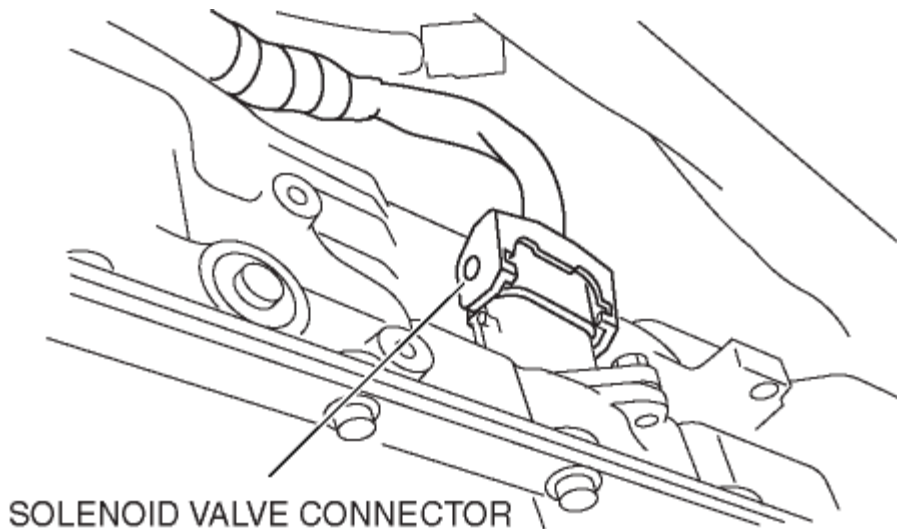
### TRANSMISSION FLUID TEMPERATURE (TFT) SENSOR INSPECTION [SJ6A-EL]

#### CAUTION:

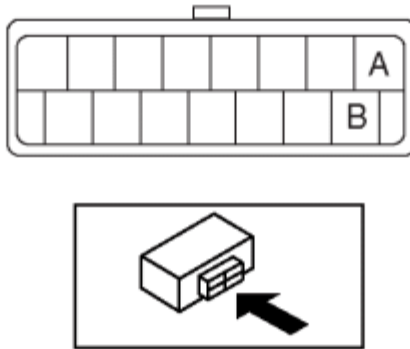
- Water or foreign material entering the connector can cause poor connections or corrosion. Be sure that water or foreign material do not enter the connector when disconnecting it.

#### On-Vehicle Inspection

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Disconnect the solenoid valve connector.



4. Measure resistance between the terminals A and B.



- If there is any malfunction, perform the off-vehicle inspection for TFT sensor.  
(See [Off-Vehicle Inspection](#).)

### Transmission fluid temperature (TFT) sensor

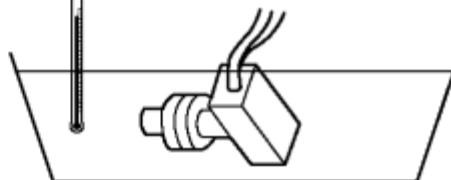
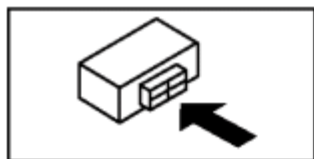
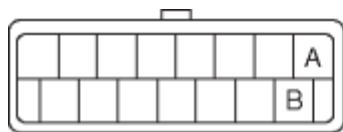
ATF temperature (°C {°F})	Resistance (kilohm)
10 {50}	6.445
25 {77}	3.5
110 {230}	0.247

5. Connect the solenoid valve connector.
6. Connect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
7. Install the battery cover.

### Off-Vehicle Inspection

#### WARNING:

- A hot the transmission and ATF can cause severe burns. Turn off the engine and wait until they are cool before replacing ATF.
1. Remove the TFT sensor. (See [TRANSMISSION FLUID TEMPERATURE \(TFT\) SENSOR REMOVAL/INSTALLATION \[SJ6A-EL\]](#).)
  2. Place the TFT sensor and a thermometer in ATF as shown in the figure, and heat the ATF gradually.
  3. Measure the resistance between the TFT sensor terminals.



- If there is any malfunction, replace the TFT sensor. (See [TRANSMISSION FLUID TEMPERATURE \(TFT\) SENSOR REMOVAL/INSTALLATION \[SJ6A-EL\].](#))

#### Transmission fluid temperature (TFT) sensor

ATF temperature (°C {°F})	Resistance (kilohm)
10 {50}	6.445
25 {77}	3.5
110 {230}	0.247

4. Install the TFT sensor. (See [TRANSMISSION FLUID TEMPERATURE \(TFT\) SENSOR REMOVAL/INSTALLATION \[SJ6A-EL\].](#))

## 2008 - MX-5 - Transmission/Transaxle

### TRANSMISSION FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION [SJ6A-EL]

#### WARNING:

- A hot transmission and ATF can cause severe burns. Turn off the engine and wait until they are cool before replacing ATF.

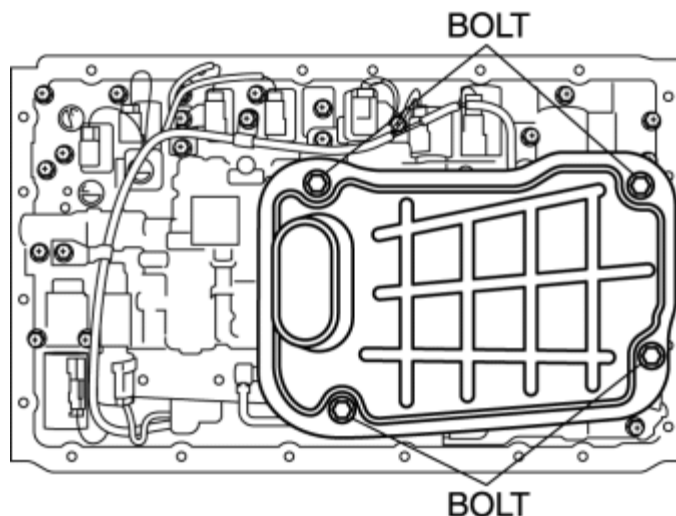
#### CAUTION:

- Water or foreign material entering the connector can cause poor connections or corrosion. Be sure that water or foreign material do not enter the connector when disconnecting it.

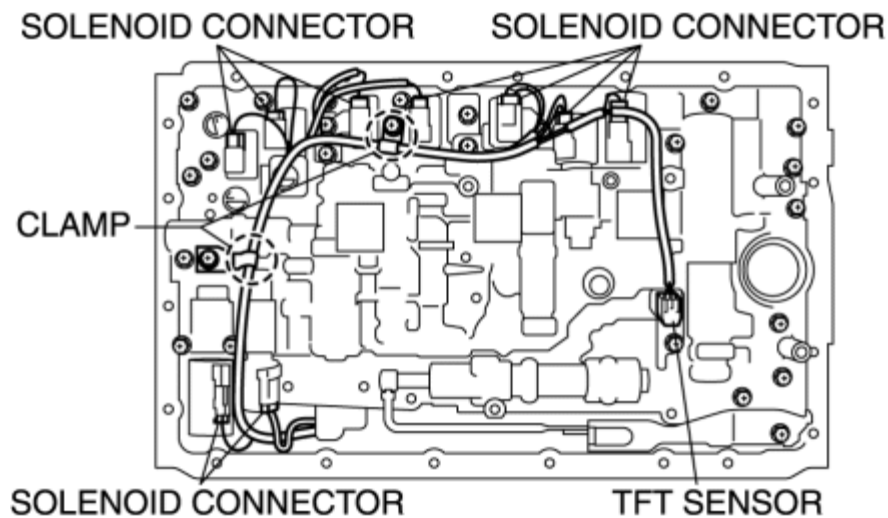
1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Drain the ATF. (See [AUTOMATIC TRANSMISSION FLUID \(ATF\) REPLACEMENT \[SJ6A-EL\]](#).)

#### CAUTION:

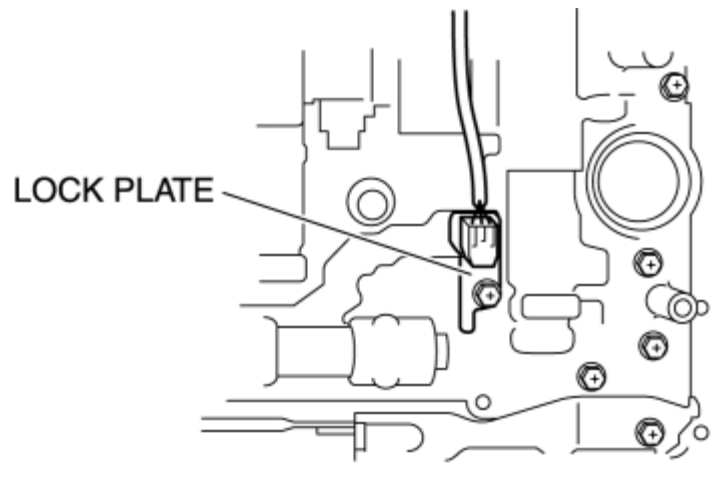
- Do not damage the fitting surface of the transmission case and the oil pan.
  - Do not deform the oil pan.
4. Remove the oil pan and gasket.
  5. Remove the oil strainer from the control valve body component.



6. Remove the O-ring from the oil strainer.
7. Disconnect the solenoid connectors from the solenoids.



8. Disconnect the coupler component from the clamps.
9. Remove the lock plate from the control valve body component.

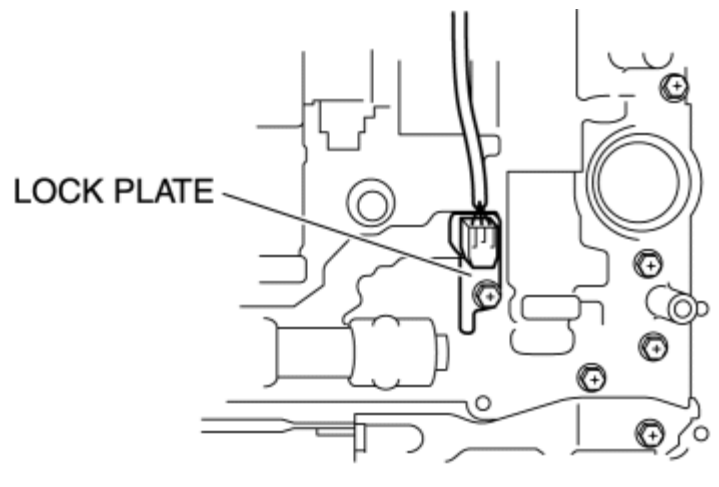


10. Pull the TFT sensor from the control valve body component.
11. Remove the coupler component mounting bolt from the transmission case.
12. Remove the coupler component from the transmission case.
13. Remove the O-ring from the coupler component.
14. Install a new O-ring to the coupler component.
15. Tighten the coupler component mounting bolt to the transmission case.

#### **Tightening torque**

- 3.9—6.9 N·m { 40—49 kgf·cm, 35—42 in·lbf }

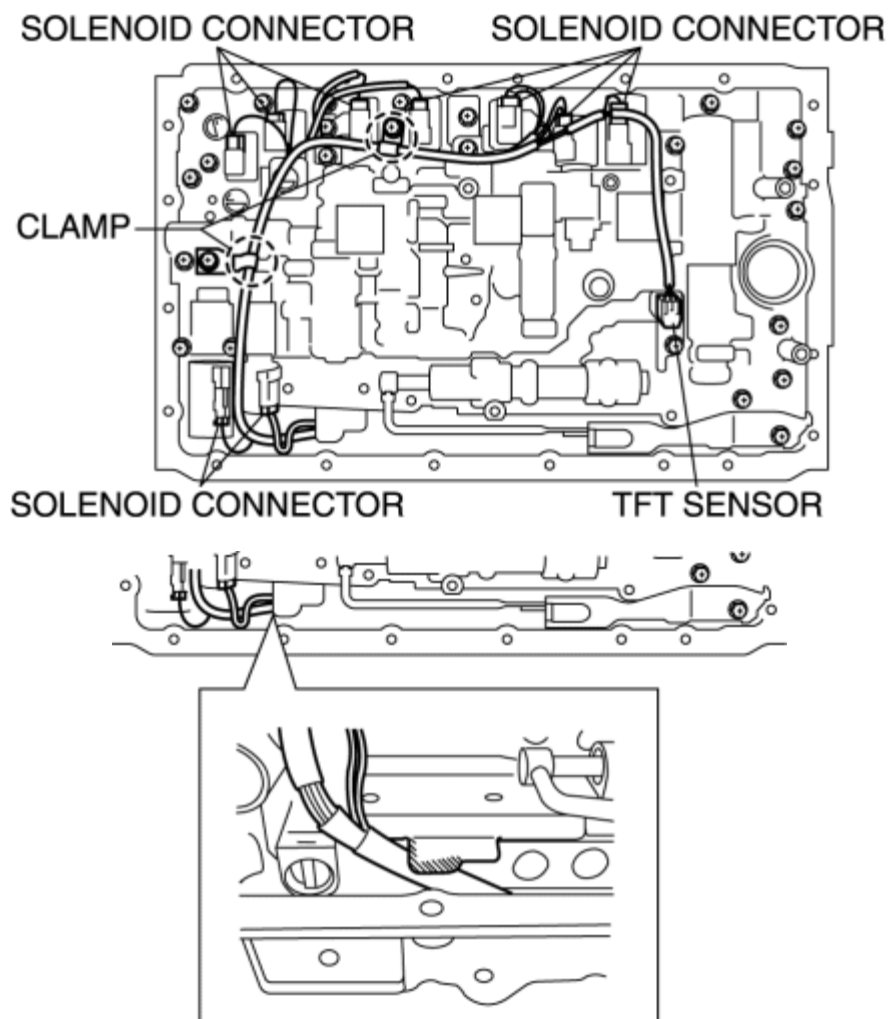
16. Install the TFT sensor and the lock plate with the bolt to the control valve body component.



### Tightening torque

- 8.0—12.0 N·m {82—122 kgf·cm, 26—42 in·lbf}

17. Connect the coupler component to the clamps.



18. Connect the solenoid connectors to the solenoids.

19. Coat a new O-ring with ATF and install it to the oil strainer.

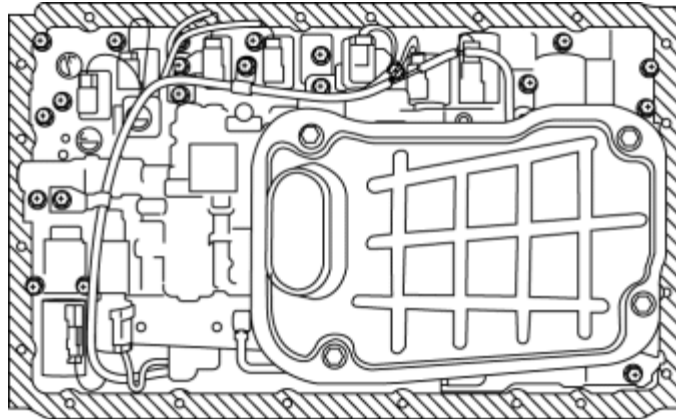
20. Install the oil strainer with the bolts to the control valve body component.

### CAUTION:



- Pay attention to the fabric so that foreign materials from it cannot come out in the transmission.

21. Clean the contact surface of oil pan and transmission case.



**CAUTION:**

- Do not damage the fitting surface of the transmission case and the oil pan.
- Do not deform the oil pan.

22. Install a new oil pan gasket and the oil pan to the transmission case.

**CAUTION:**

- Be reminded that bolts might be damaged if tightened too much since the gasket is cork-made and there is little tightening sense.

23. Tighten the oil pan installation bolt.

**Tightening torque**

- 3.9—4.9 N·m {40—49 kgf·cm, 35—42 in·lbf}

24. Connect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)

25. Install the battery cover.

26. Add ATF and, with the engine idling, inspect the ATF level and inspect for leakage. (See [AUTOMATIC TRANSMISSION FLUID \(ATF\) LEVEL ADJUSTMENT \[SJ6A-EL\]](#).)

## 2008 - MX-5 - Transmission/Transaxle

### OIL SEAL (OIL PUMP) REPLACEMENT [SJ6A-EL]

1. Remove the automatic transmission. (See [AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION \[SJ6A-EL\]](#).)

#### CAUTION:

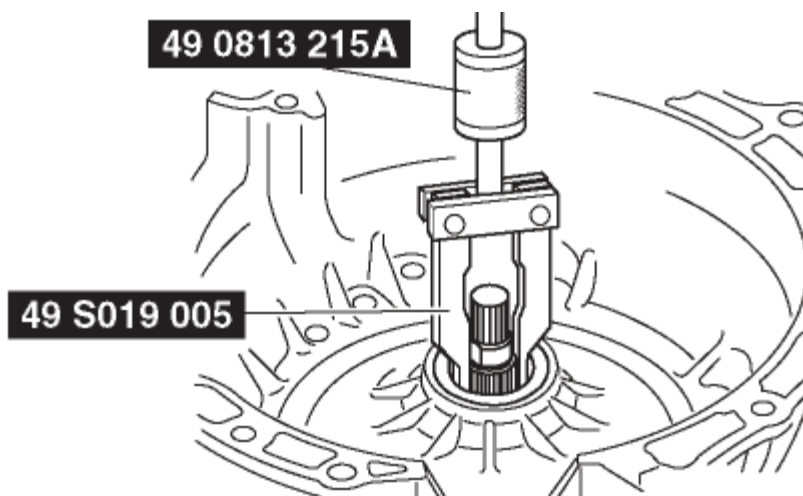
- The oil seal is easily damaged by the sharp edges of the torque converter splines. Do not let the splines contact the oil seal.
- Do not drop the torque converter.
- Do not pinch fingers.

2. Remove the torque converter. (See [TORQUE CONVERTER REMOVAL/INSTALLATION \[SJ6A-EL\]](#).)

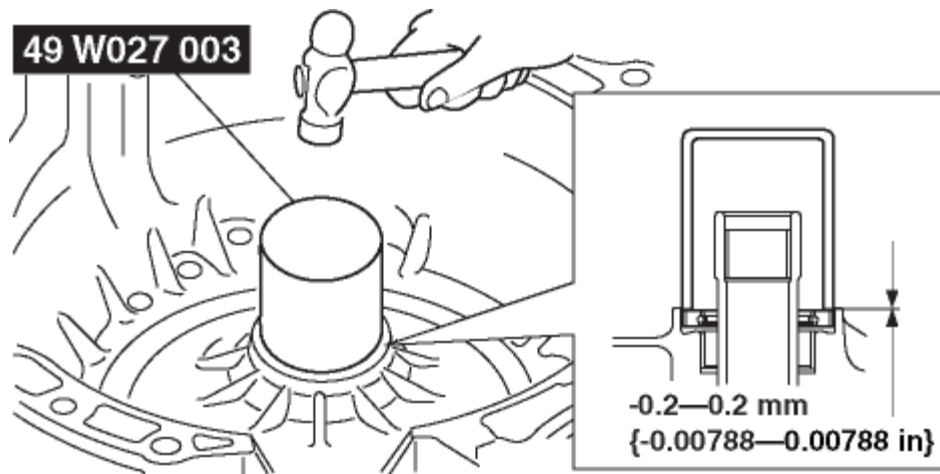
#### CAUTION:

- Do not to damage the bushing on the oil pump body.

3. Remove the oil seal from the oil pump body using the **SST**.



4. Using the **SST** and a hammer, install the new oil seal to the oil pump body.



5. Coat the lip of the oil seal with grease.
6. Install the torque converter. (See [TORQUE CONVERTER REMOVAL/INSTALLATION \[SJ6A-EL\]](#).)
7. Install the automatic transmission. (See [AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION \[SJ6A-EL\]](#).)
8. Perform the mechanical system test. (See [MECHANICAL SYSTEM TEST \[SJ6A-EL\]](#).)

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## 2008 - MX-5 - Transmission/Transaxle

### CONTROL VALVE BODY REMOVAL [SJ6A-EL]

#### On-Vehicle Removal

##### WARNING:

- A hot transmission and ATF can cause severe burns. Turn off the engine and wait until they are cool before replacing ATF.
- Using compressed air can cause dirt and other particles to fly out, causing injury to the eyes. Wear protective eye wear whenever using compressed air.

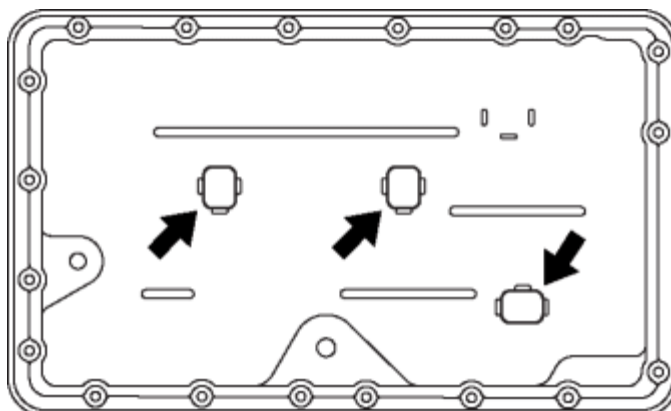
##### CAUTION:

- Clean the transmission exterior thoroughly with a stream cleaner or cleaning solvents before removal.
- If any old sealant gets into the transmission during installation of the oil pan, trouble may occur in the transmission case and oil pan. Clean with cleaning fluids.

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Drain the ATF. (See [AUTOMATIC TRANSMISSION FLUID \(ATF\) REPLACEMENT \[SJ6A-EL\]](#).)

##### CAUTION:

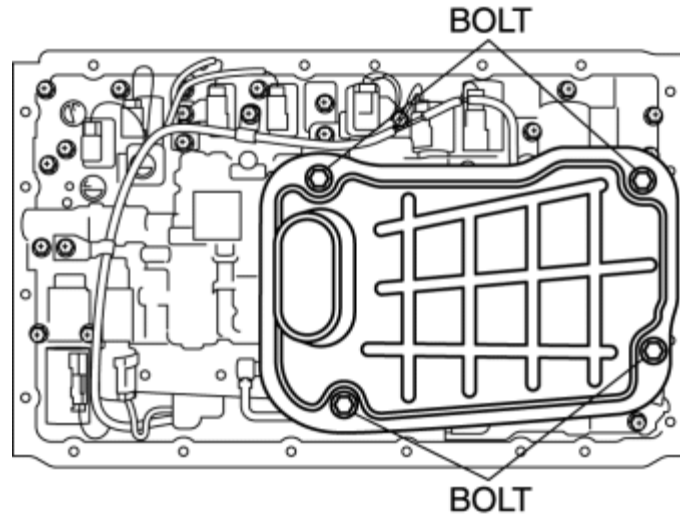
- Do not damage the fitting surface of the transmission case and the oil pan.
  - Do not to deform the oil pan.
4. Remove the oil pan and the oil pan gasket.
  5. Remove the magnets from the oil pan.



##### NOTE:

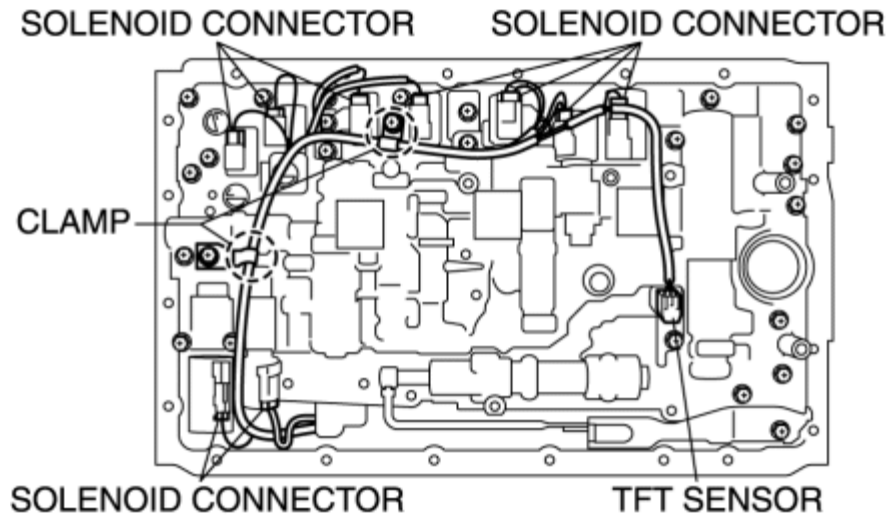
- Examine the chips and particles in the oil pan to determine what type of wear has occurred in the transmission. Steel (magnetic)= bearing, gear and plate wear. Brass (non-magnetic)= bushing wear.

6. Remove the oil strainer from the control valve body component.



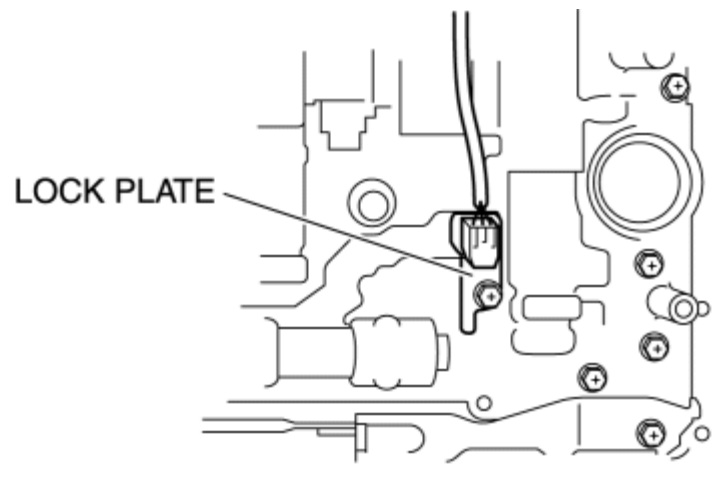
7. Remove the O-ring from the oil strainer.

8. Disconnect the solenoid connectors from the solenoids.



9. Disconnect the coupler component from the clamps.

10. Remove the lock plate from the control valve body component.

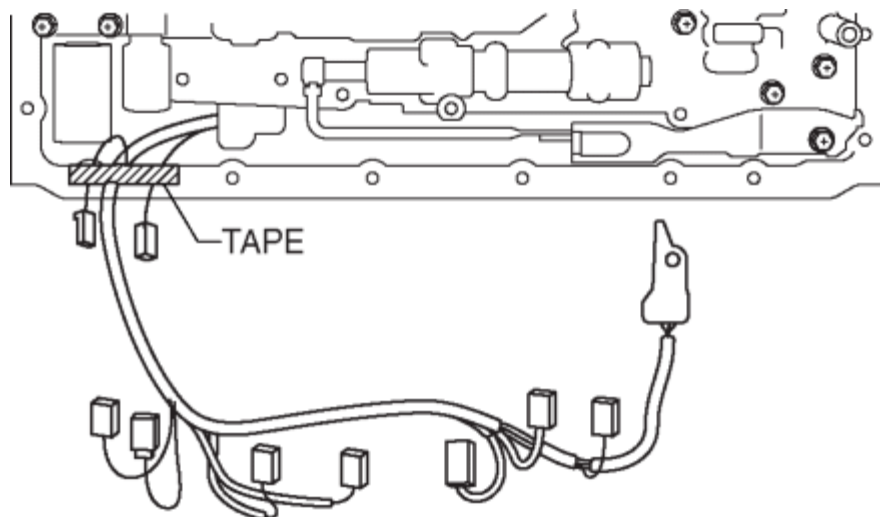


11. Pull the TFT sensor from the control valve body component.

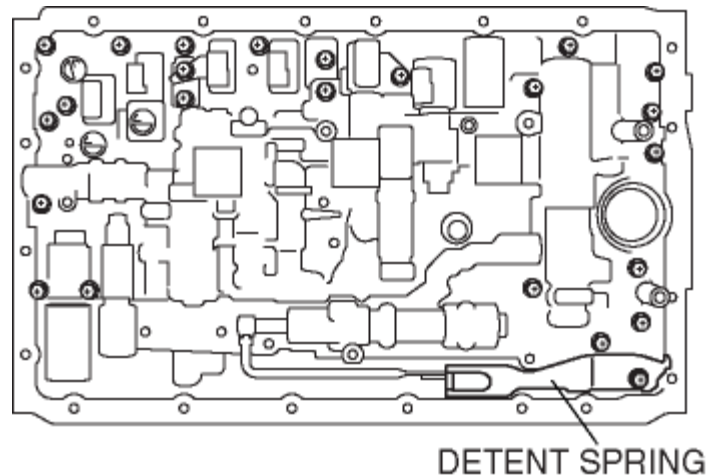
**NOTE:**

- Be sure that the coupler component does not interface with the control valve body component when installing.

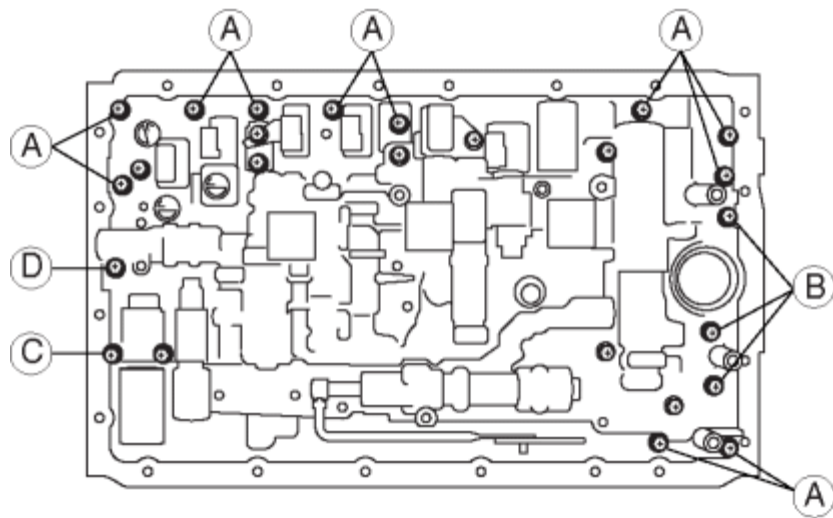
12. Fix the coupler component with tape to the transmission case as shown in the figure.



13. Remove the detent spring cover and detent spring from the control valve body component.



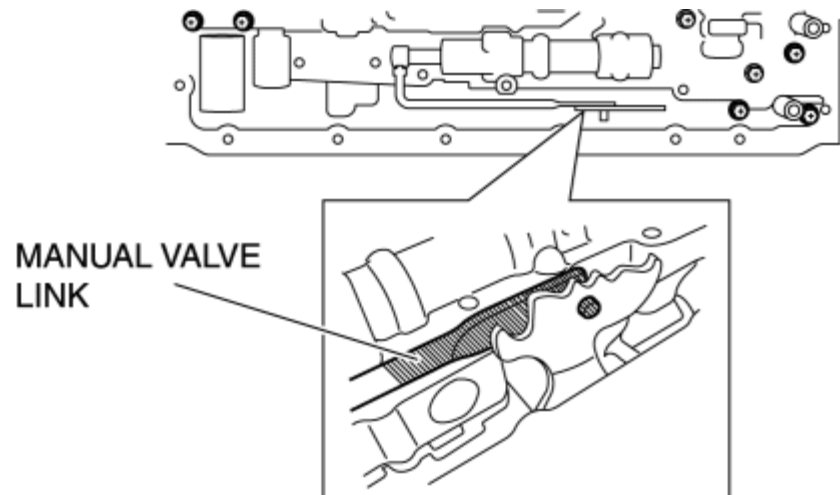
14. Remove the bolts from the transmission case as shown in the figure.



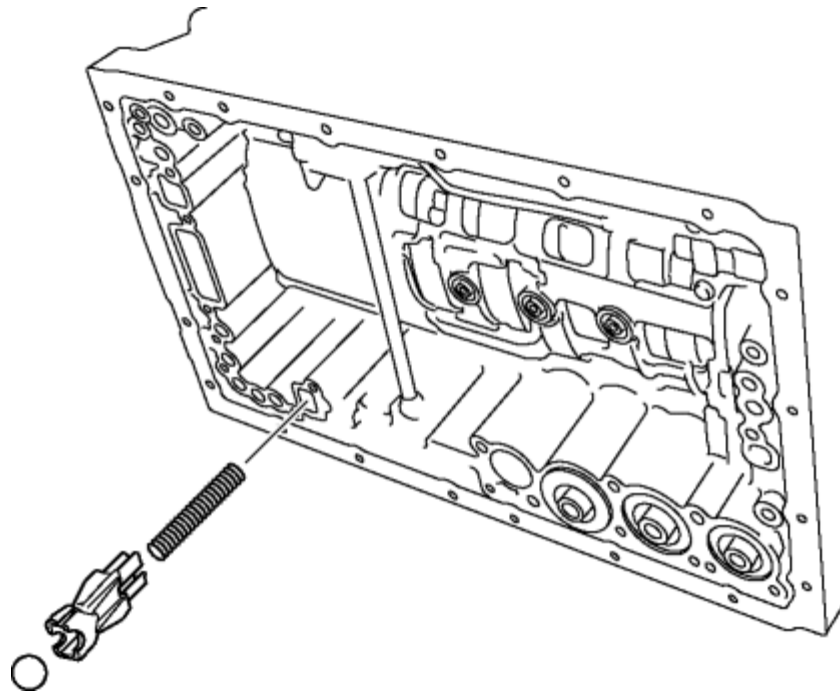
**CAUTION:**

- Do not to drop the control valve body component.

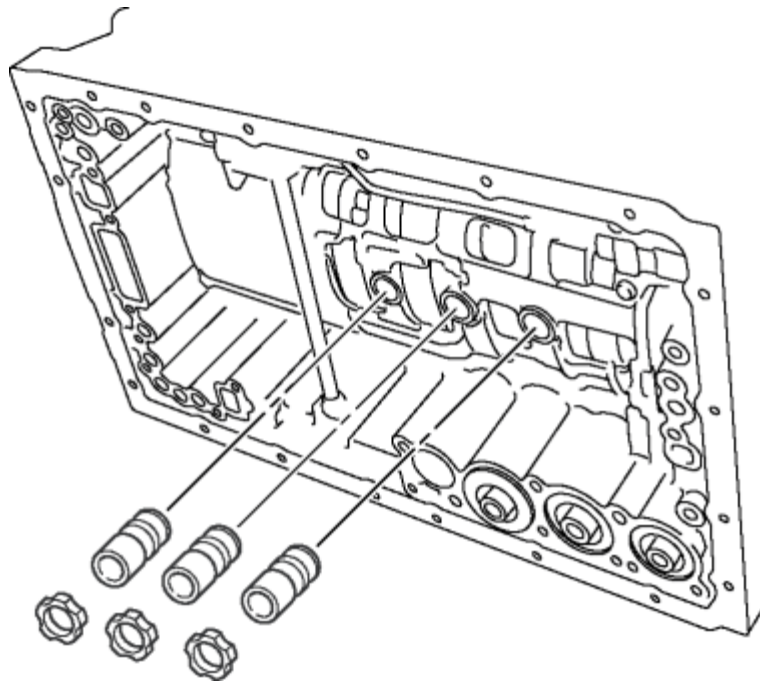
15. Disconnect the manual valve link and remove the control valve body component.



16. Remove the check valve sub-component and the compression spring from the transmission case.



17. Remove the transmission case gaskets and the brake drum gaskets from the transmission case.

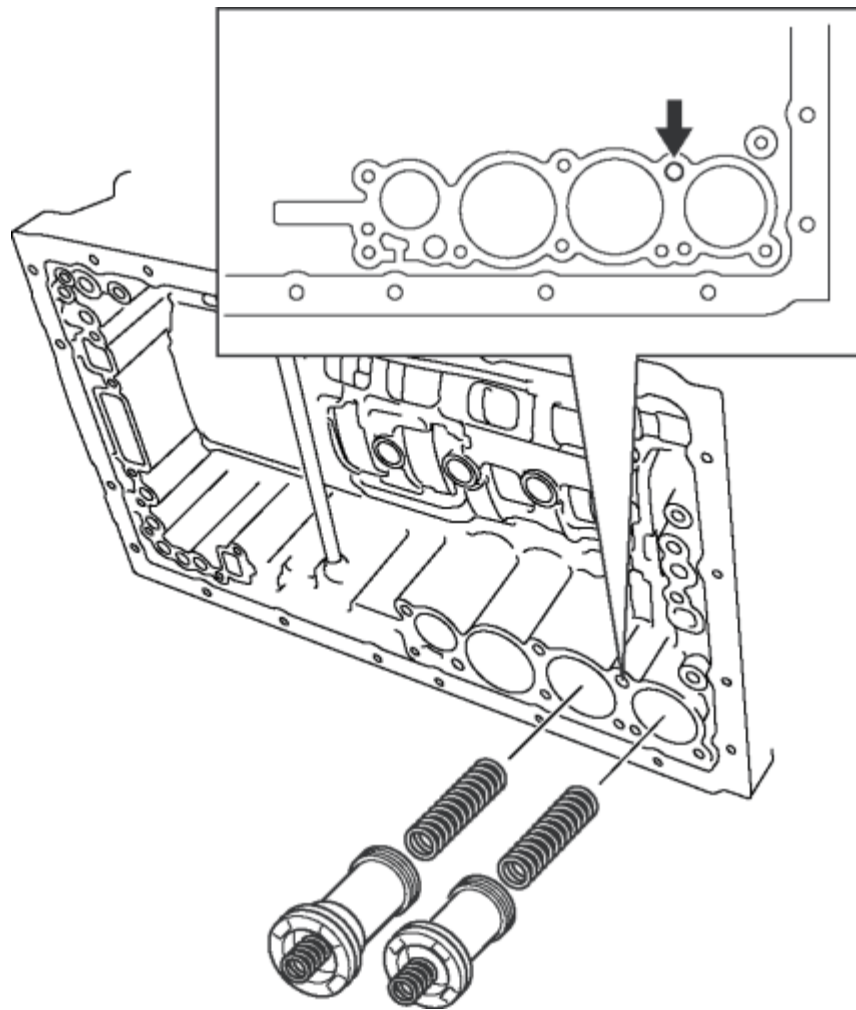


**CAUTION:**

- Take care as the C-2 and B-3 accumulator piston may eject.

18. Apply compressed air into the oil passage as shown in the figure and remove the accumulator pistons (C-2, B-3) and the compression springs from the transmission case.





**CAUTION:**

- Do not to damage the accumulator pistons.

19. Remove the snap rings from the accumulator pistons (C-2, B-3) using a flathead screwdriver.

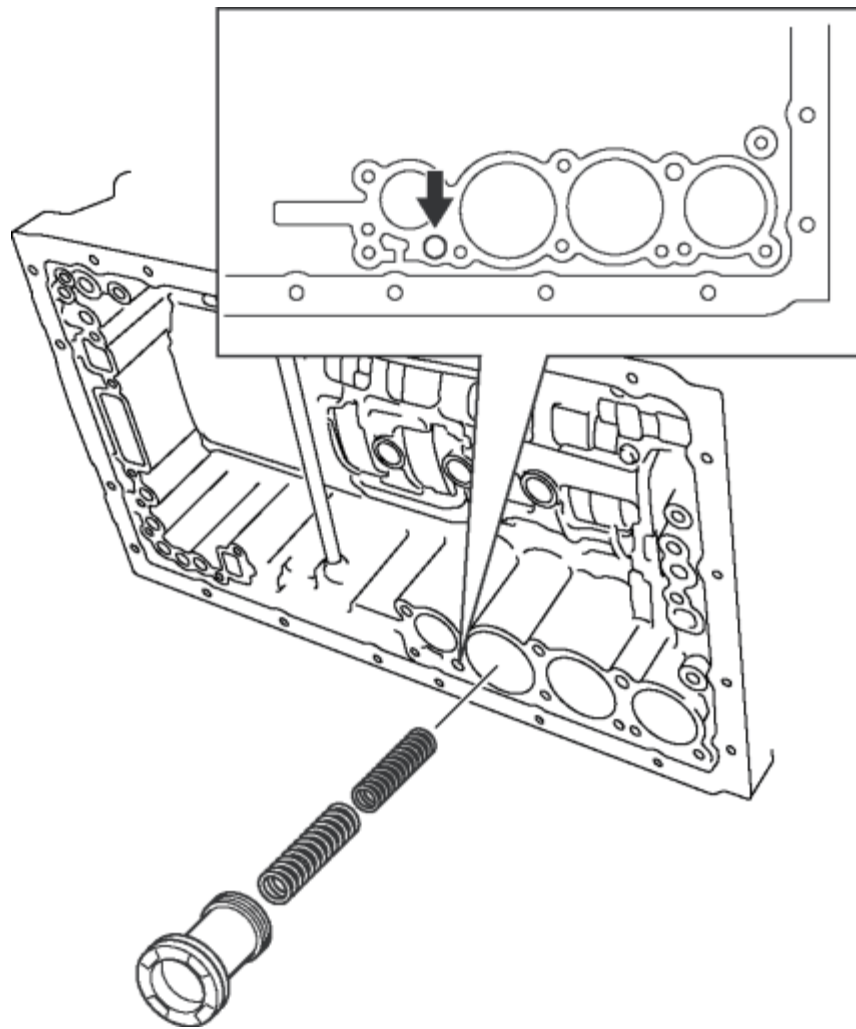
20. Remove the compression springs from the accumulator pistons (C-2, B-3).

21. Remove the O-rings from the accumulator pistons (C-2, B-3) using a flathead screwdriver.

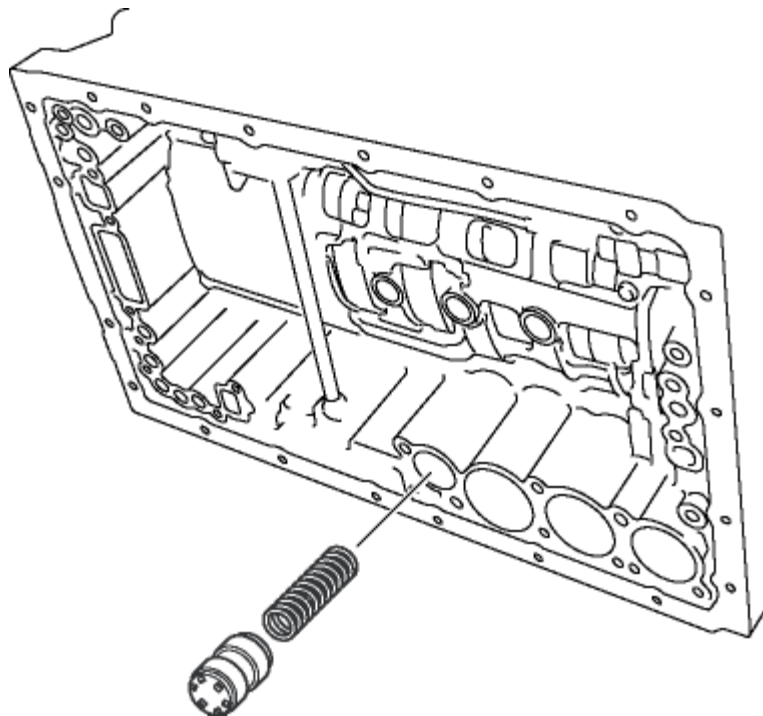
**CAUTION:**

- Take care as the C-3 accumulator piston may eject.

22. Apply compressed air into the oil passage as shown in the figure and remove the accumulator piston (C-3) and compression springs from the transmission case.



23. Remove the O-rings from the accumulator piston (C-3) using a flathead screwdriver.
24. Remove the accumulator valve and compression springs from the transmission case.





## 2008 - MX-5 - Transmission/Transaxle

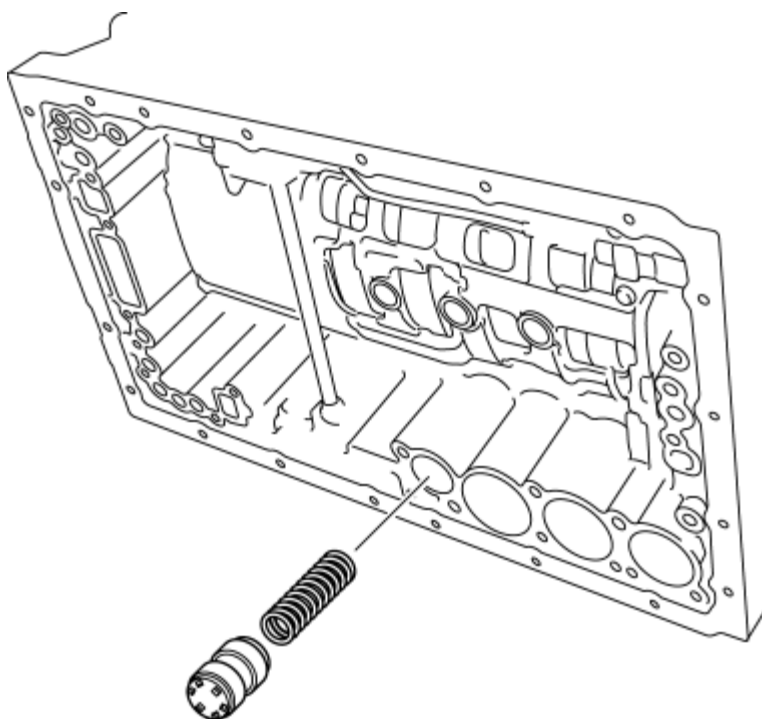
### CONTROL VALVE BODY INSTALLATION [SJ6A-EL]

#### On-Vehicle Installation

#### CAUTION:

- When installing the control valve body component, do not put the coupler component in the open space of the separate plate in the control valve body component.
- Do not pinch the coupler component between the separate plate and the control valve body component.

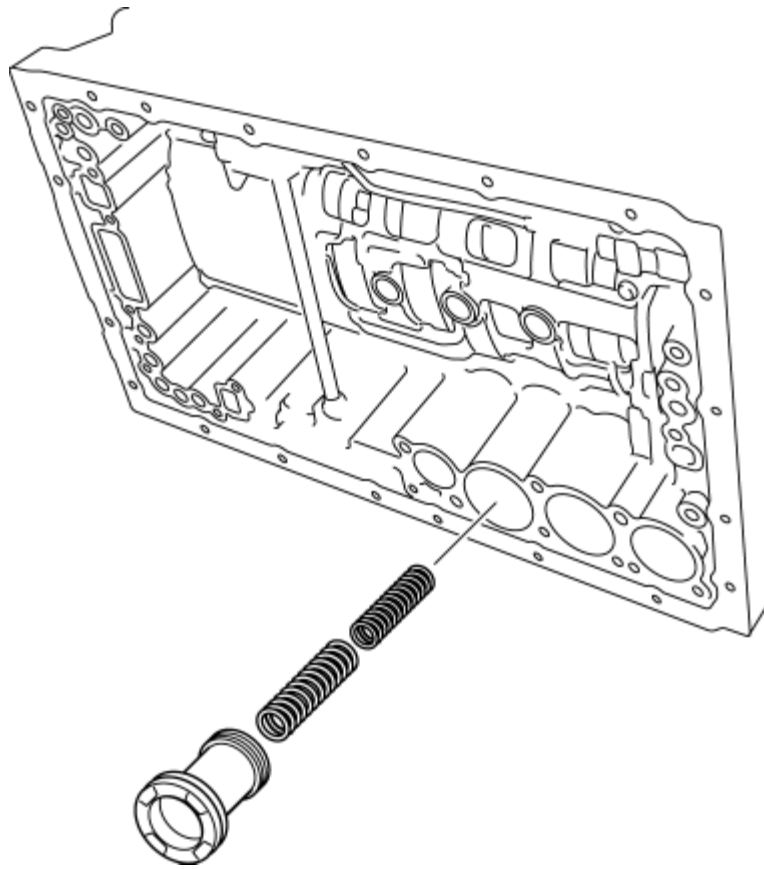
1. Install the accumulator valve and compression springs to the transmission case.



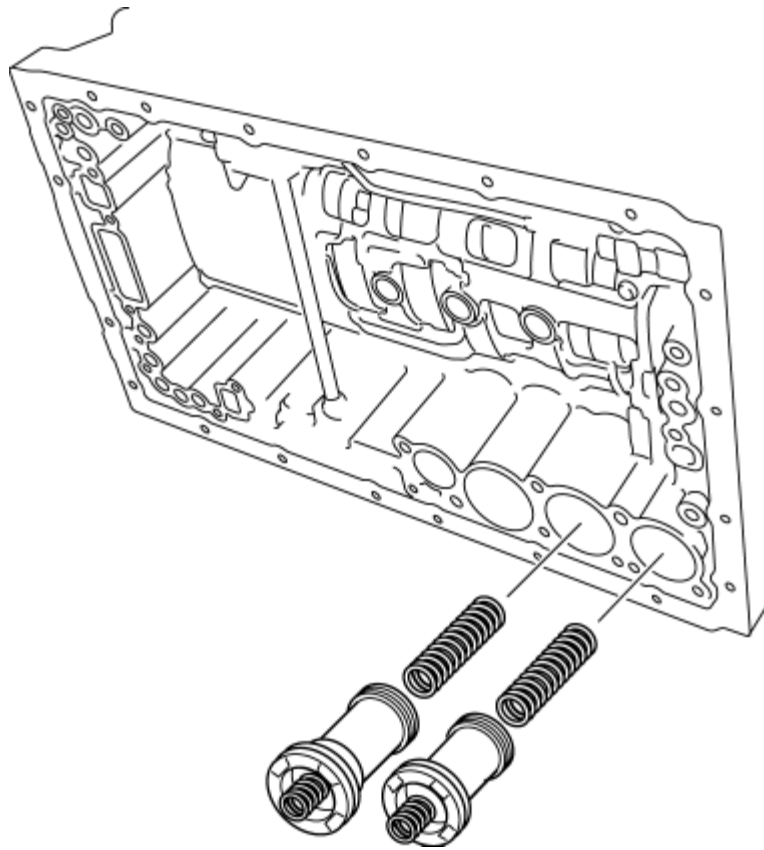
#### CAUTION:

- Do not to damage the O-ring and accumulator piston.

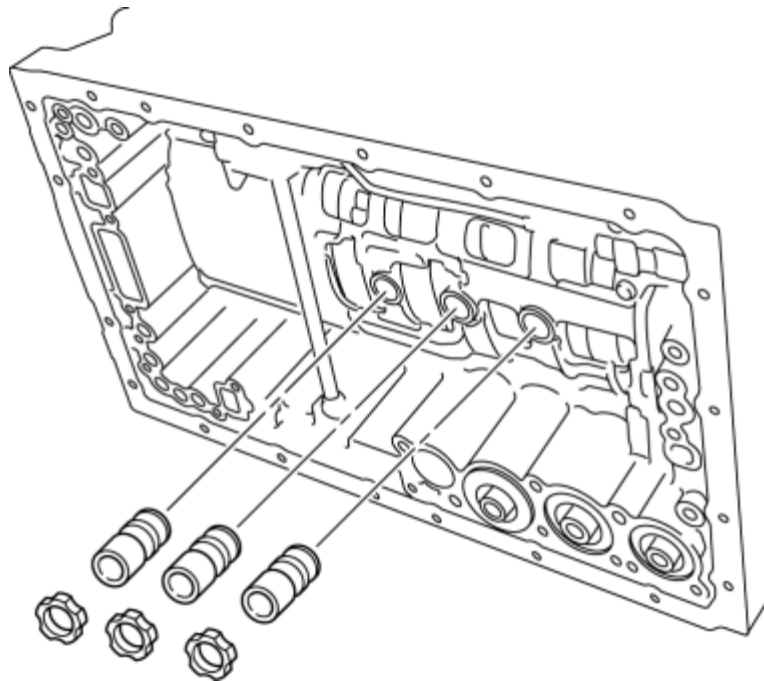
2. Coat the new O-rings with ATF, and install it to the accumulator piston (C-3).
3. Install the accumulator piston (C-3) and the compression spring to the transmission case.



4. Coat the new O-rings with ATF, and install it to the accumulator pistons (C-2, B-3).
5. Install the compression springs and the snap rings to the accumulator pistons (C-2, B-3) using a flathead screwdriver.
6. Install the accumulator pistons (C-2, B-3) and the compression springs to the transmission case.



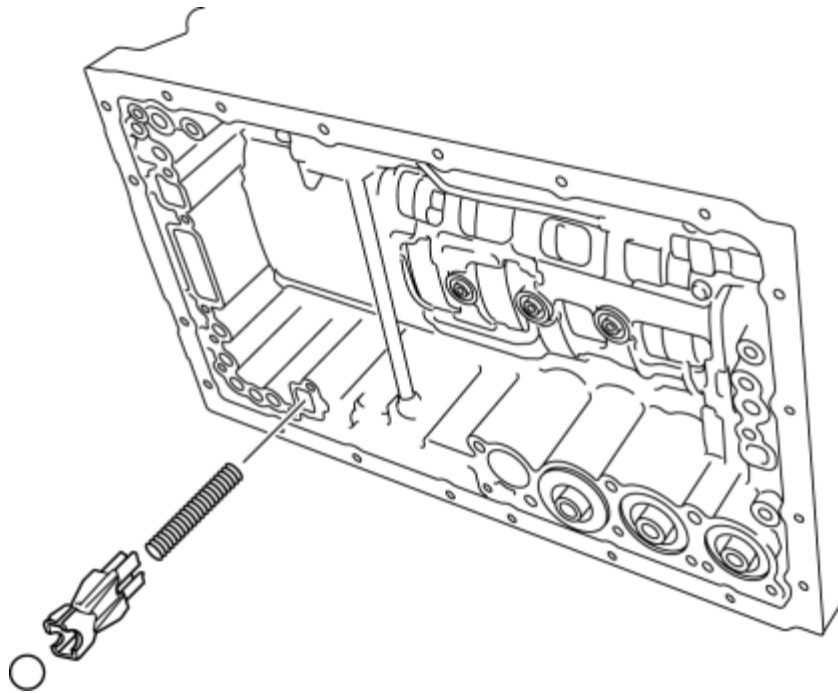
7. Coat the new transmission gaskets and the new brake drum gaskets with ATF, and install it to the transmission case.



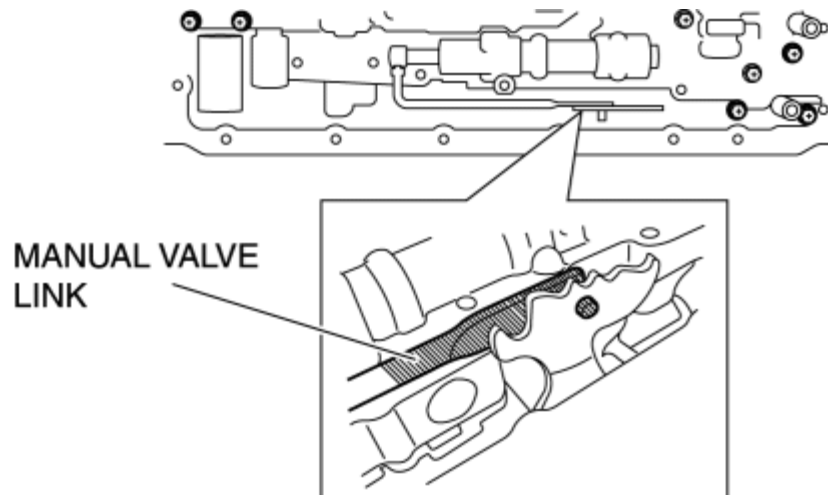
**CAUTION:**

- Do not to damage the gasket.

8. Install the check valve sub-component and the compression spring to the transmission case.

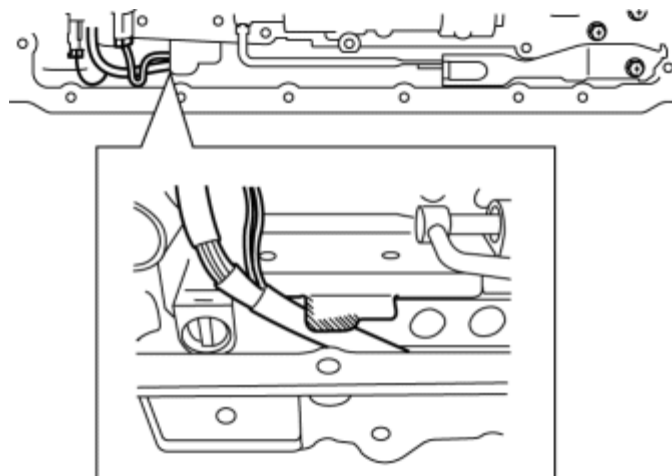


9. Connect the manual valve link and install the control valve body component.

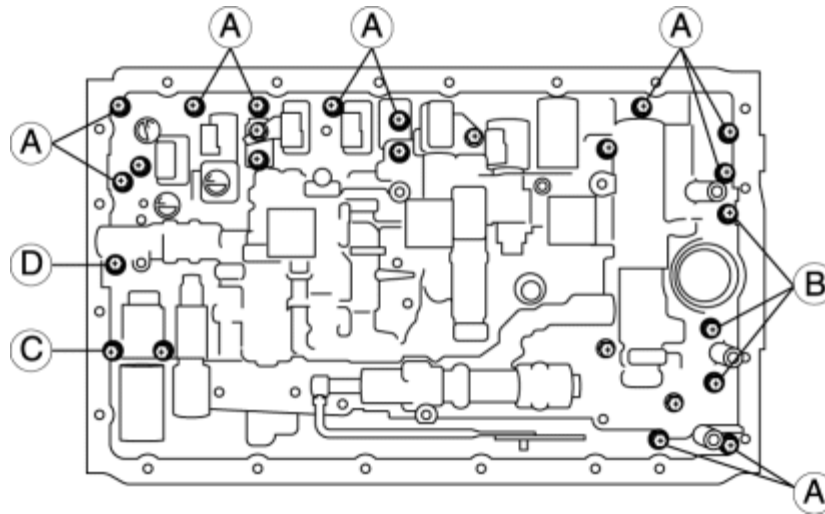


**CAUTION:**

- When installing, be sure to put the wiring harness in the concave portion of the separator plate in the control valve body component as shown in the figure.



10. Temporarily install the control valve body component with the bolts.



**Bolt length (measured from below the head)**

- A: 25 mm {0.984 in}
- B: 36mm {1.42 in}
- C: 45mm {1.77 in}
- D: 50mm {1.97 in}

**NOTE:**

- Aligning the bolt holes, temporarily tighten the bolts by hand.
- Be sure to tighten the inner bolts first.

11. Tighten the bolts.

**Tightening torque**

- 10.0—12.0 N·m {102—122 kgf·cm, 89—105 in·lbf}

12. Install the detent spring cover and detent spring with the bolt to the control valve body component.

**Tightening torque**

- 8.0—12.0 N·m {82—122 kgf·cm, 72—105 in·lbf}

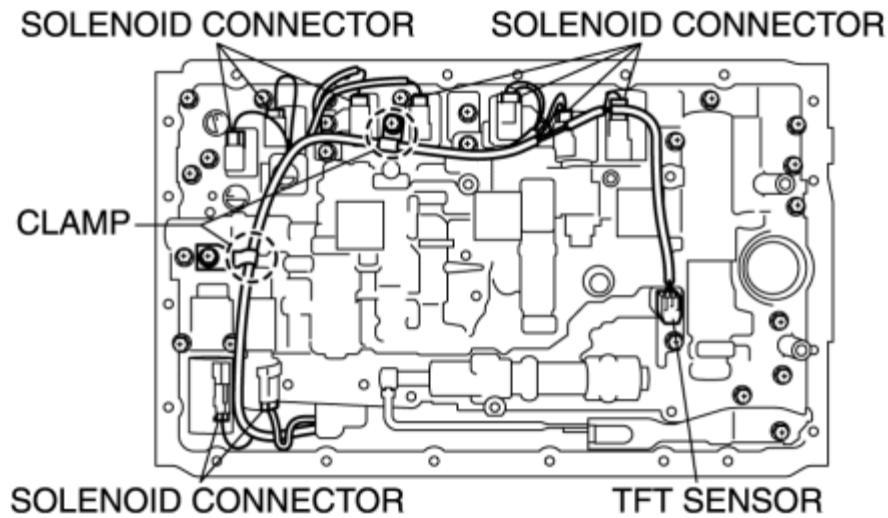
13. Install the TFT sensor and the lock plate with the bolt to the control valve body component.

**Tightening torque**

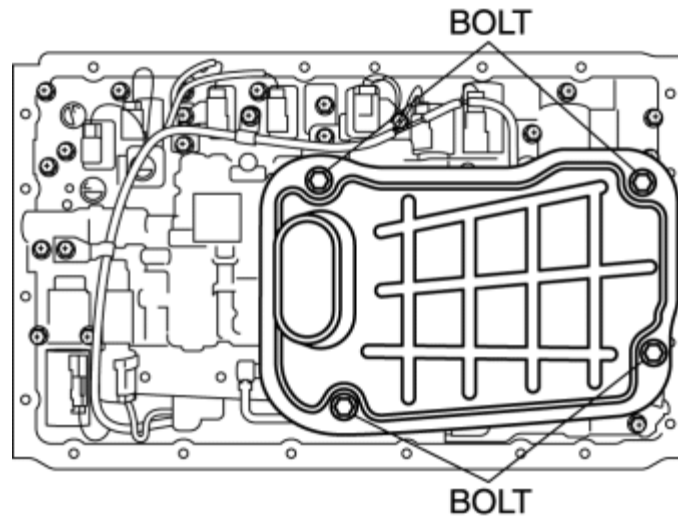
- 8.0—12.0 N·m {82—122 kgf·cm, 72—105 in·lbf}

14. Connect the coupler component to the clamps.





15. Connect the solenoid connectors to the solenoids.
16. Coat a new O-ring with ATF and install it to the oil strainer.
17. Install the oil strainer with the bolts to the control valve body component.



#### **Tightening torque**

- 8.0—12.0 N·m {82—122 kgf·cm, 72—105 in·lbf}

#### **CAUTION:**

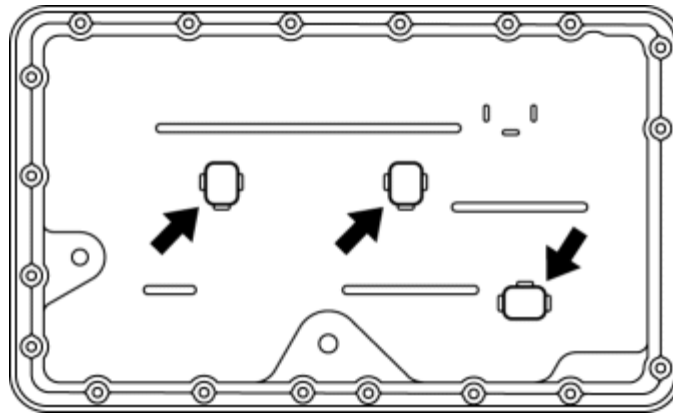
- Pay attention to the fabric so that foreign materials from it cannot come out in the transmission.

18. Clean the contact surface of oil pan and transmission case.

#### **NOTE:**

- Clean the oil cleaner magnets before install it.

19. Install the magnets to the oil pan.



**CAUTION:**

- Do not to damage the contact surface of the transmission case and the oil pan.
- Do not to deform the oil pan.

20. Install a new oil pan gasket and the oil pan to the transmission case.

**CAUTION:**

- Be careful that bolts might be damaged if tightened too much since the gasket is cork-made.

21. Install the bolts to the transmission case.

**Tightening torque**

- 3.9—4.9 N·m { 40—49 kgf·cm, 35—42 in·lbf }

22. Connect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)

23. Install the battery cover.

24. Add ATF and, with the engine idling, inspect the ATF level and for leakage. (See [AUTOMATIC TRANSMISSION FLUID \(ATF\) LEVEL ADJUSTMENT \[SJ6A-EL\]](#).)

25. Perform the mechanical system test. (See [MECHANICAL SYSTEM TEST \[SJ6A-EL\]](#).)

26. Perform the road test. (See [ROAD TEST \[SJ6A-EL\]](#).)

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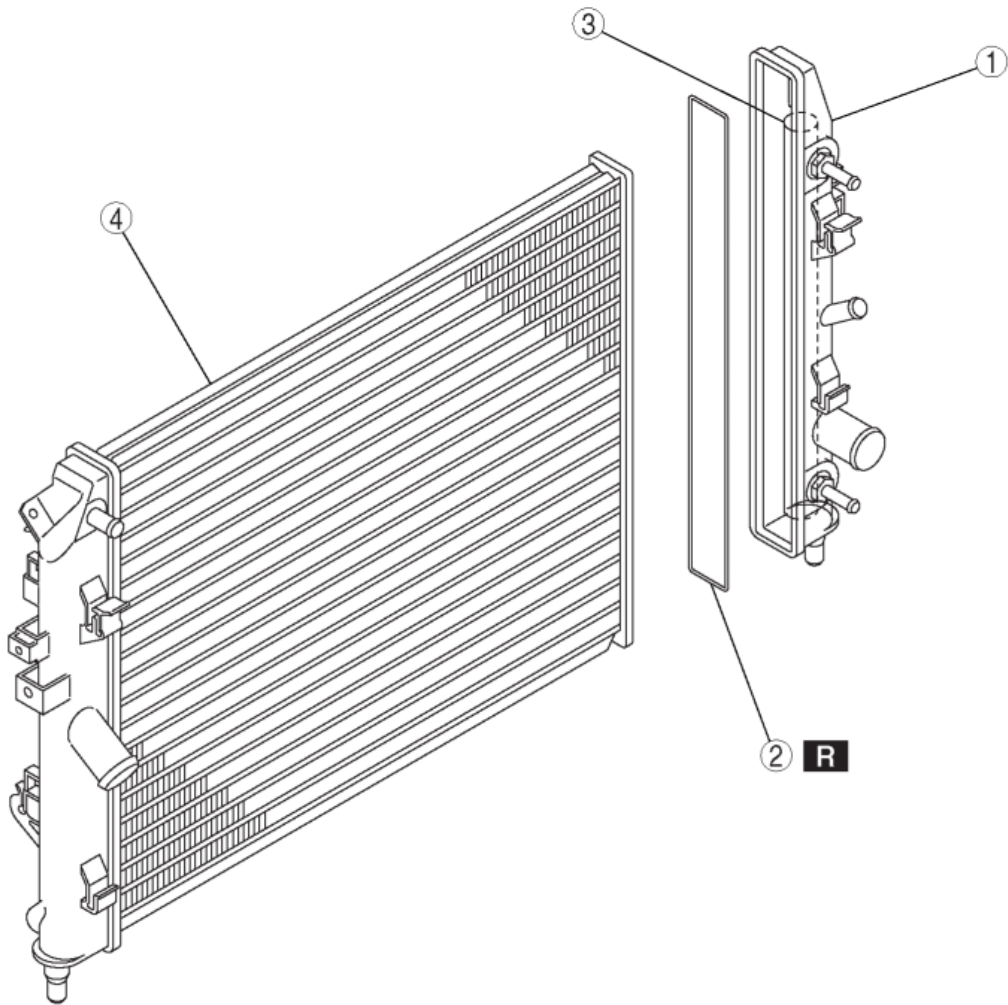
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2008 - MX-5 - Transmission/Transaxle

OIL COOLER DISASSEMBLY/ASSEMBLY [SJ6A-EL]

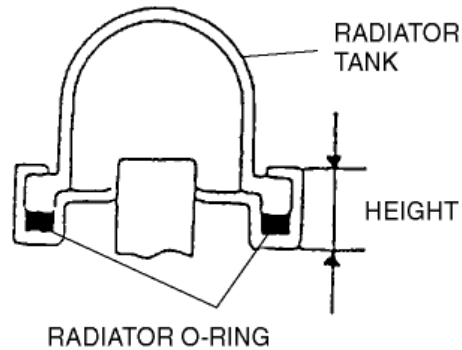
- 1. Disassemble in the order indicated in the table.
- 2. Assemble in the reverse order of disassembly.



1	Radiator outer tank (in-tank oil cooler) (See Radiator Outer Tank (In-Tank Oil Cooler) Disassembly Note.) (See Radiator Outer Tank (In Tank Oil Cooler) Assembly Note.)
2	O ring
3	ATF cooler

### Radiator Outer Tank (In-Tank Oil Cooler) Disassembly Note

1. Inspect the height of the header tabs.

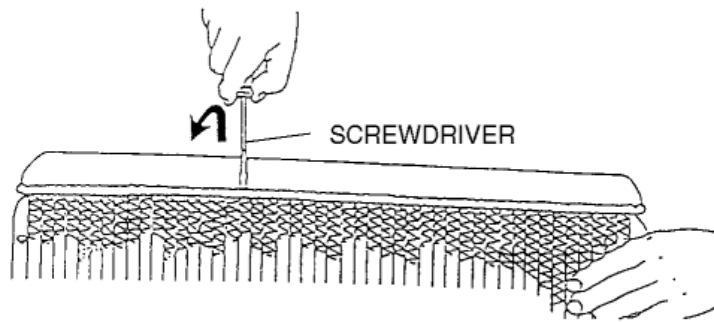


2. Insert the end of a medium tip screwdriver between the end of the header tab and the outer tank.

**NOTE:**

- Do not open more tabs than necessary for tank removal.

3. Pivot the screwdriver to pry the tab away from the tank and repeat the procedure for each tab.



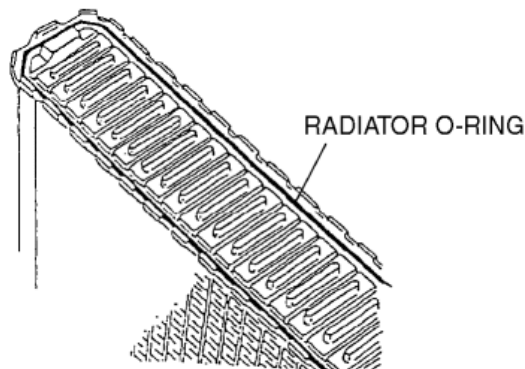
**NOTE:**

- If any header tabs are missing from the core, replace the radiator.

4. Remove the radiator outer tank and O ring (gasket) from the core header when all of the tabs are opened.
5. Inspect the gasket surface of the radiator core header to ensure it is clean and free of foreign material or damage.
6. Inspect the radiator outer tank for warping. If it is warped, replace the radiator tank.

### Radiator Outer Tank (In Tank Oil Cooler) Assembly Note

1. Install a new O ring and ensure it is not twisted.



**NOTE:**

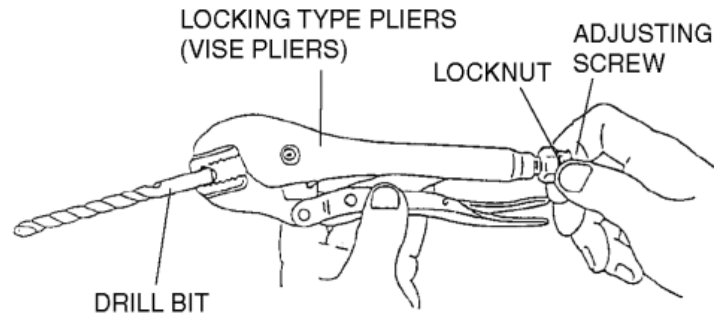
- The old O ring must be replaced.

2. Position the radiator tank in the original direction to the core using care not to scratch the tank sealing surface with the header tabs.

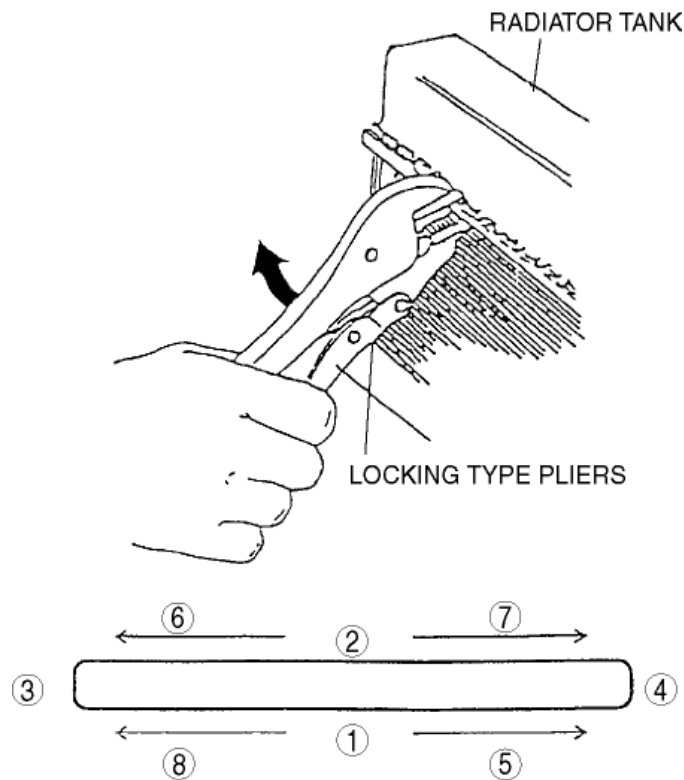
**NOTE:**

- Step 3 will set jaw opening to the correct specification.

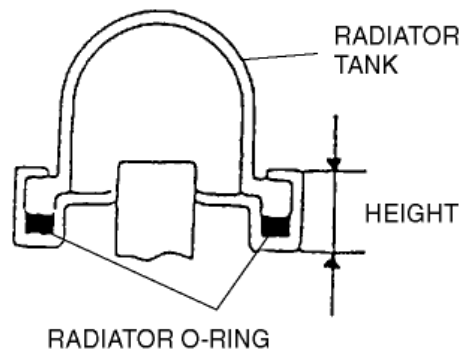
3. With the jaws of locking type pliers (vise grips) closed and locked, turn the adjusting screw to position the jaws against the drill bit with the diameter measured (height) in removal procedure 1. Tighten the lock nut on the adjusting screw against the handle to lock the adjustment in place.



4. Squeeze the header tabs down in the order as shown in the figure against the lip of the radiator outer tank base with the locking type pliers while rotating the pliers toward the tank.



5. Verify that the height of the header tabs is same as the height before removal.



6. Inspect for leakage from radiator. (See [ENGINE COOLANT LEAKAGE INSPECTION \[LF\]](#).)



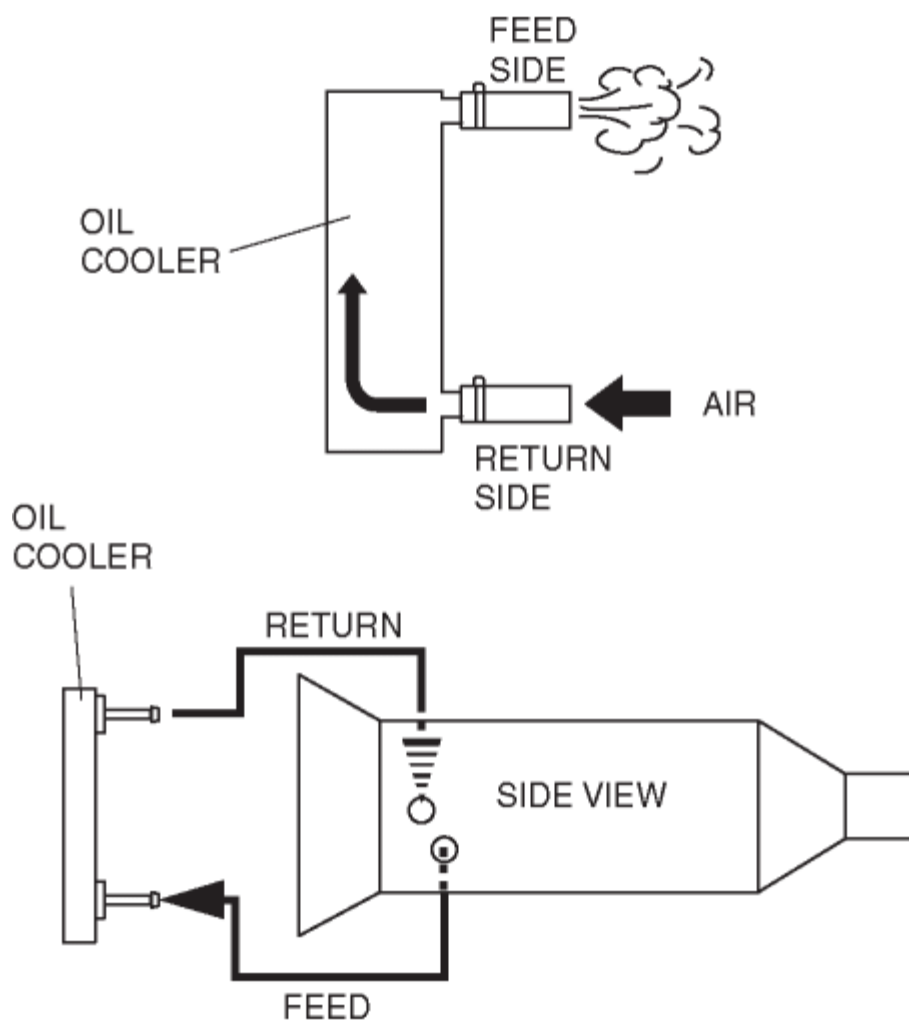
## 2008 - MX-5 - Transmission/Transaxle

### OIL COOLER FLUSHING [SJ6A-EL]

#### NOTE:

- The contaminated cooler line (oil pipes and hoses) and auxiliary cooler must be flushed completely when AT is overhauled or replaced.

1. Remove the two oil cooler line hoses and apply air pressure of **196 kPa {2.0 kgf/cm<sup>2</sup>, 28 psi}** from the return hose (pipe) side.



#### CAUTION:

- Power flushing should be performed very carefully when removing the accumulated debris from the fluid baffle, otherwise the debris cannot be removed or the problem becomes even worse.

#### NOTE:

- Performing back and reverse power flushing two times each does not work because debris or particles flow out from the feed pipe side of AT.

2. If there is no air blown out the feed side, flush the oil cooler lines using the power-flushing tool. (See [Power Flushing](#).) **Recommended power flushing manufacturer**

Manufacturer	Part number	Description
Kent Moore	J35944-AMAZ	Flushing kit or equivalent
OTC	60081	Portable torque converter, oil cooler cleaner or equivalent

## Power Flushing

### Repair procedure

1. Before power flushing, inspect the hoses/lines and clamps. Power flushing must begin with back flushing followed by forward flushing to quickly dislodge the restriction. If back flushing is not performed before forward flushing, the restriction could further reduce the ATF flow through the internal mesh type baffle of the cooler and flushing will not be effective or possible.

### Inspecting oil lines and clamps

1. Be sure to inspect the lines (hoses/pipes) for cuts, crimps (pinched), cracks or any other damage before reusing them.

- If there is any malfunction, replace lines and clamps.

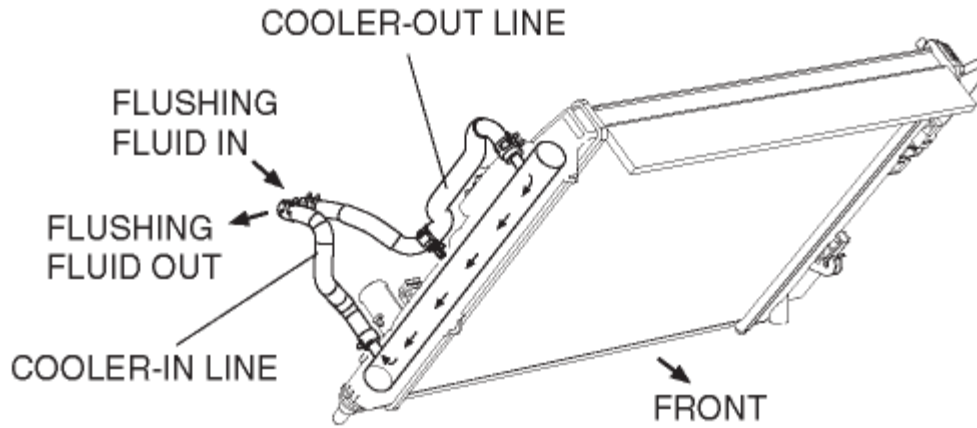
### CAUTION:

- Always use new clamps when replacing hoses.

### Back flushing

1. Following the power flushing equipment manufacturer's instructions, connect equipment so the flushing fluid flows in the opposite direction of normal fluid flow.





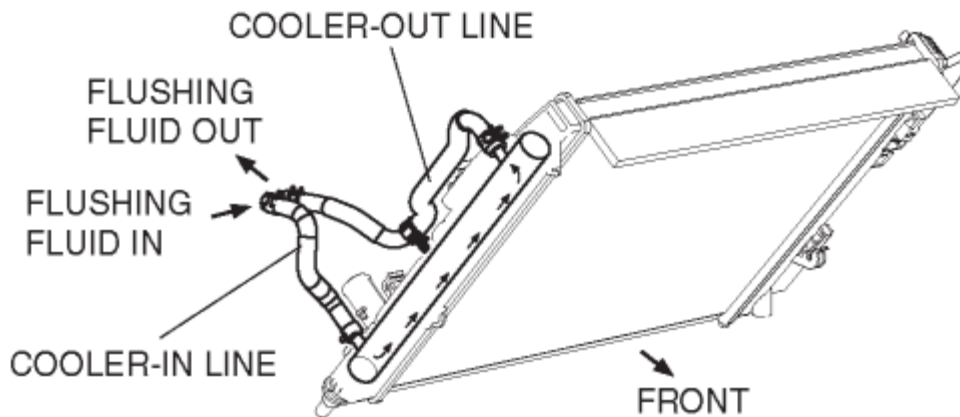
2. Flush oil cooler/lines until discharge fluid is clean.

**CAUTION:**

- If the cooler can not be properly flushed using recommended equipment, send the radiator out for sublet cleaning or replace.

**Forward flushing**

1. Connect power flushing equipment so the flushing fluid flows in the direction of normal fluid flow.



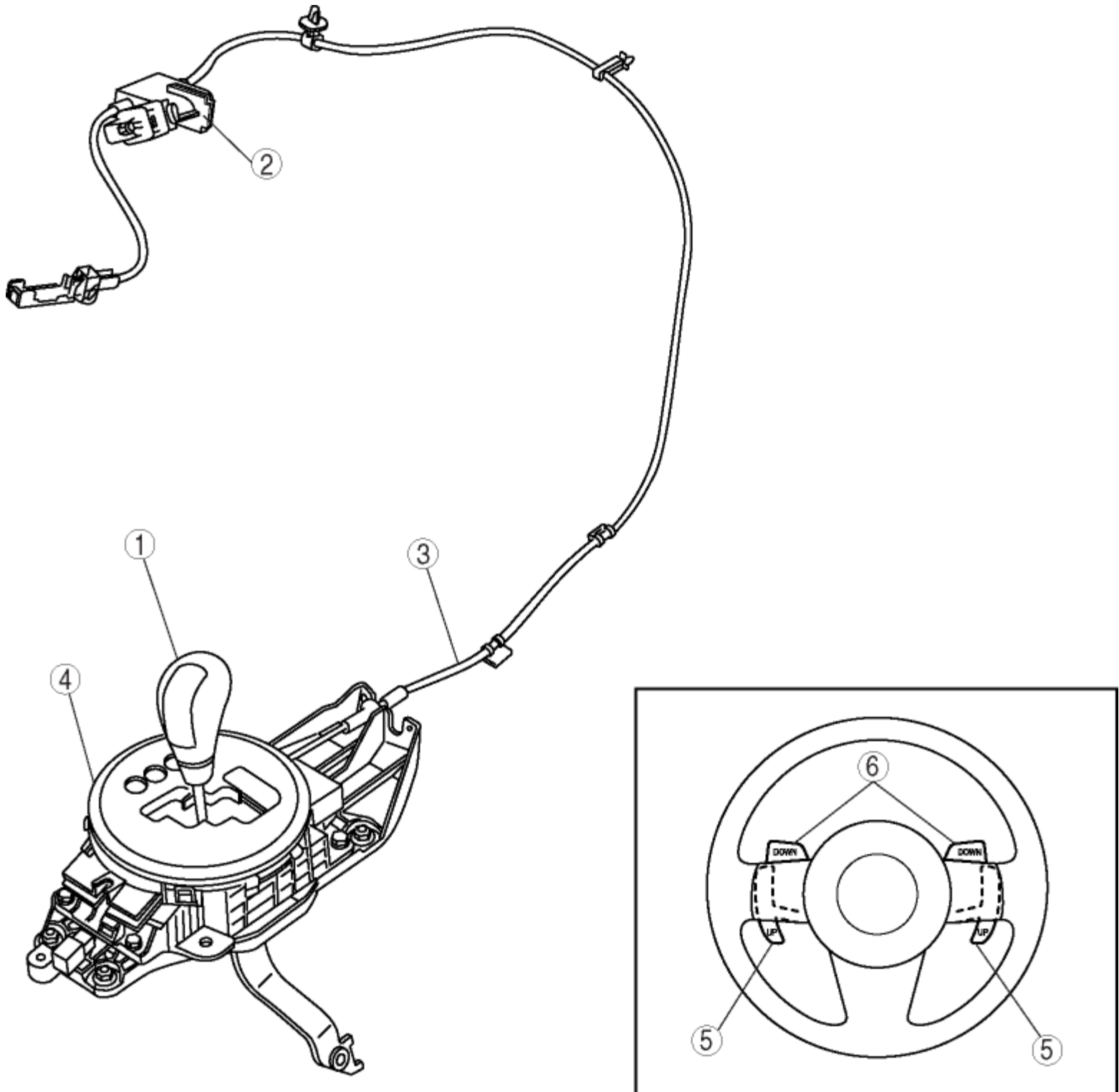
2. Flush oil cooler/lines until discharged fluid is clean.

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### AUTOMATIC TRANSMISSION SHIFT MECHANISM LOCATION INDEX



1	Shift lock  (See <a href="#">SHIFT LOCK INSPECTION.</a> )
2	Key interlock  (See <a href="#">KEY INTERLOCK INSPECTION.</a> )
3	Interlock cable  (See <a href="#">INTERLOCK CABLE INSPECTION.</a> )  (See <a href="#">INTERLOCK CABLE ADJUSTMENT.</a> )
4	Selector lever  (See <a href="#">SELECTOR LEVER INSPECTION.</a> )  (See <a href="#">SELECTOR LEVER COMPONENT INSPECTION.</a> )  (See <a href="#">SELECTOR LEVER REMOVAL/INSTALLATION.</a> )
5	Steering shift switch (up switch)  (See <a href="#">STEERING SHIFT SWITCH REMOVAL/INSTALLATION.</a> )  (See <a href="#">STEERING SHIFT SWITCH INSPECTION.</a> )
6	Steering shift switch (down switch)  (See <a href="#">STEERING SHIFT SWITCH REMOVAL/INSTALLATION.</a> )  (See <a href="#">STEERING SHIFT SWITCH INSPECTION.</a> )

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### KEY INTERLOCK INSPECTION

1. Verify that the key cannot be pulled out except in the P position.
  - If there is any malfunction, inspect the interlock cable. (See [INTERLOCK CABLE INSPECTION](#).)

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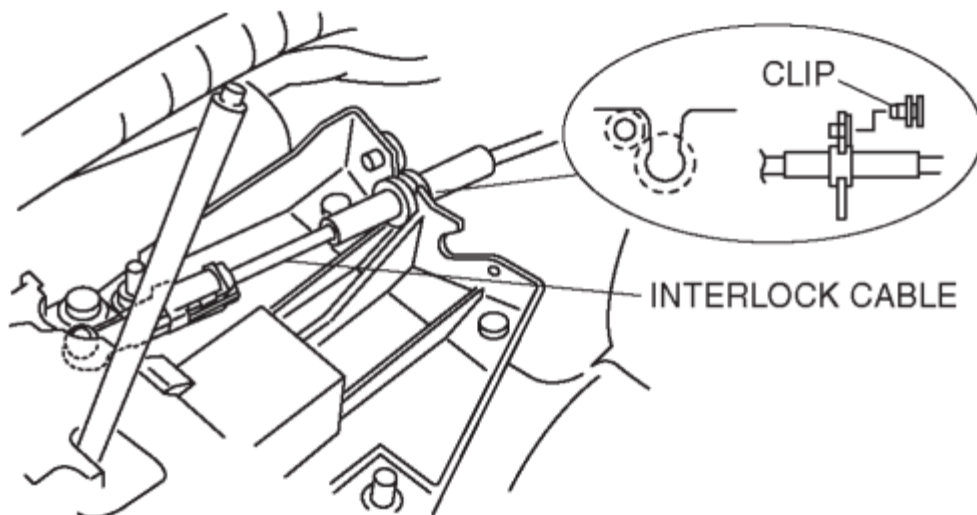
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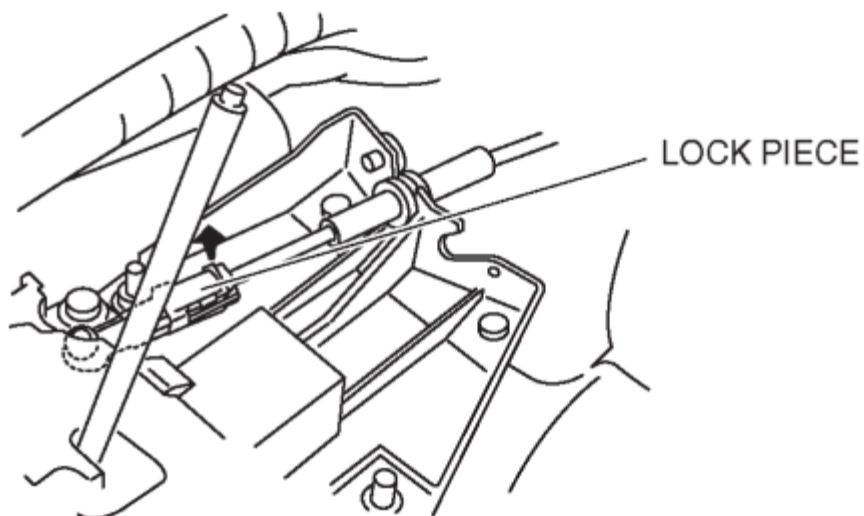
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### INTERLOCK CABLE INSPECTION

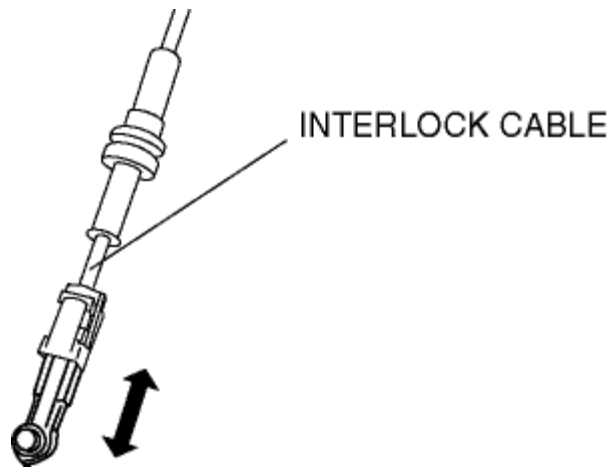
1. Turn the ignition switch to the ON position. (engine off)
2. Remove the clip of the selector lever base plate, then remove the interlock cable from the U-groove.



3. Remove the interlock cable from the selector lever.



4. Verify that the interlock cable moves freely with the brake pedal depressed.



- If there is any malfunction, replace the interlock cable.

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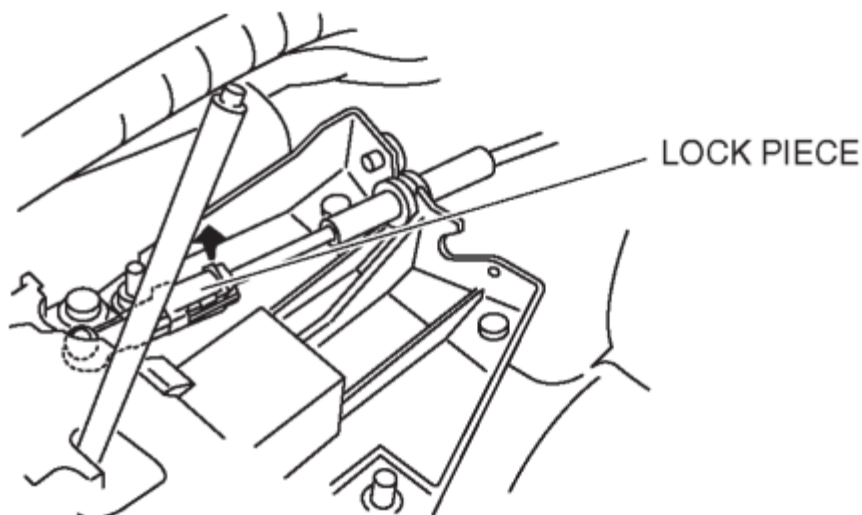
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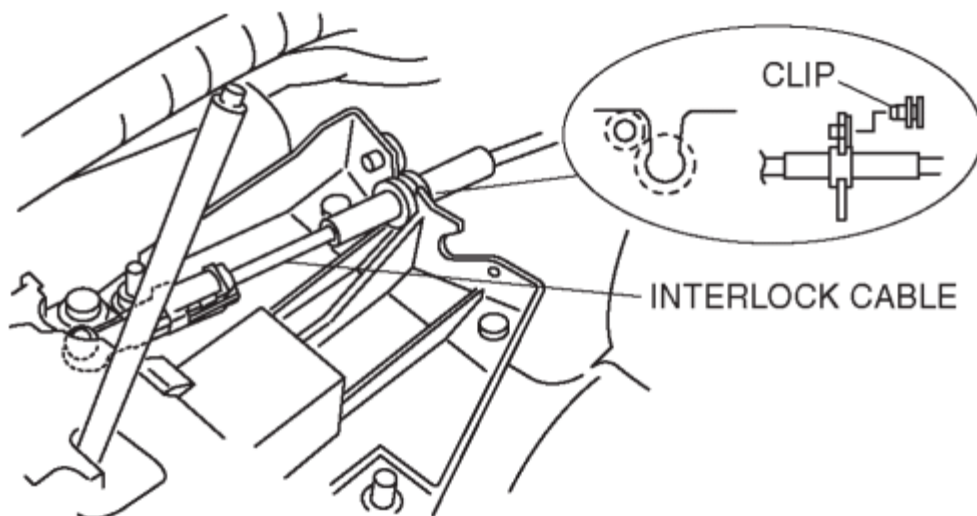
## 2008 - MX-5 - Transmission/Transaxle

### INTERLOCK CABLE ADJUSTMENT

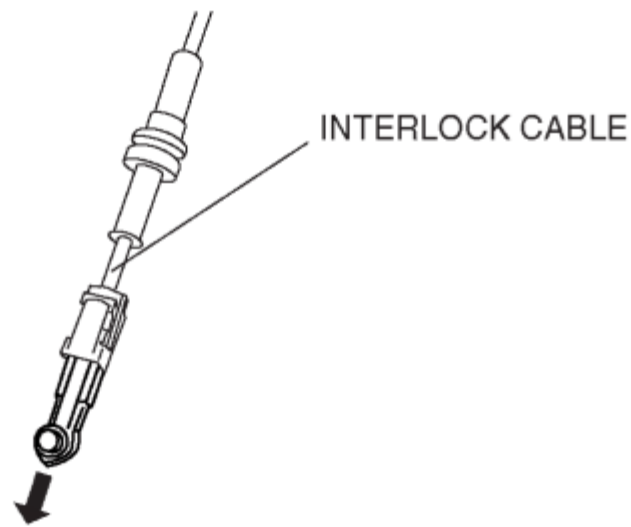
1. Turn the ignition switch to the ON position. (engine off)
2. Pull up the lock piece of the interlock cable to release the lock.



3. Remove the clip of the selector lever base plate, then remove the interlock cable from the U-groove.

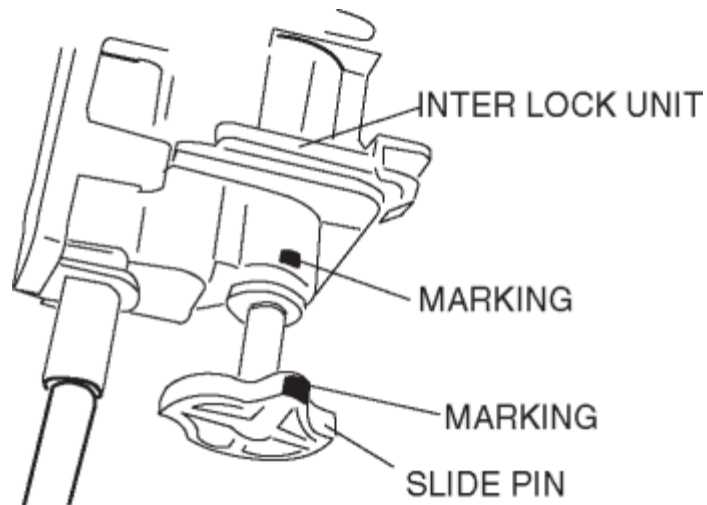


4. Remove the interlock cable from the selector lever.
5. Fully pull the end of the interlock cable to the selector lever.

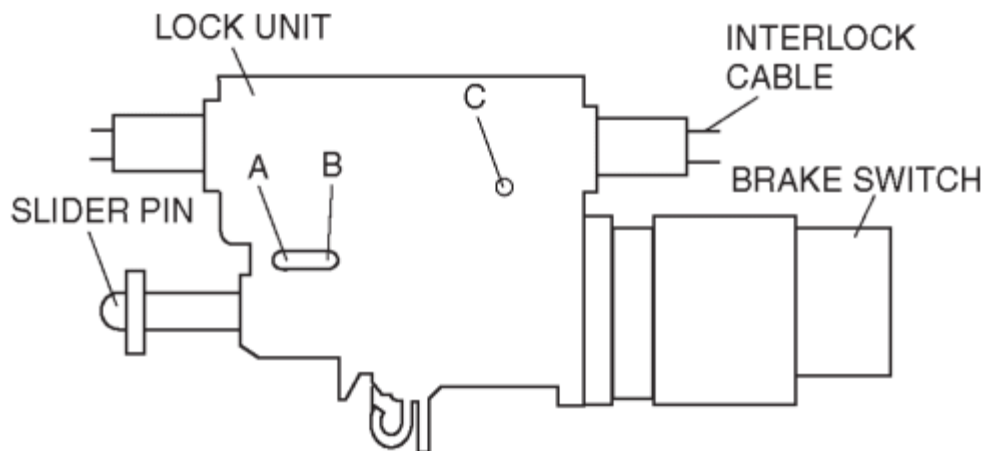


6. Remove the lock unit from the bracket.

7. Verify that the markings on the slider pin and the lock unit are aligned.



8. Push a **1.5 mm {0.06 in}** round bar or similar into hole A by fully pushing the slider pin in.



9. Push a **1.5 mm {0.06 in}** round bar or similar into hole B and hole C of the lock unit until it passes through.

10. Disconnect the brake switch connector.

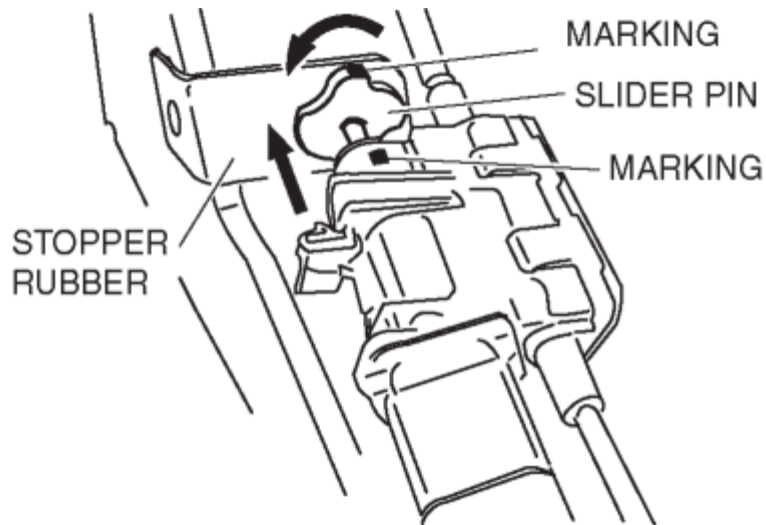


11. Remove the brake switch. (See [BRAKE PEDAL REMOVAL/INSTALLATION](#).)
12. Install the new brake switch. (See [BRAKE PEDAL REMOVAL/INSTALLATION](#).)

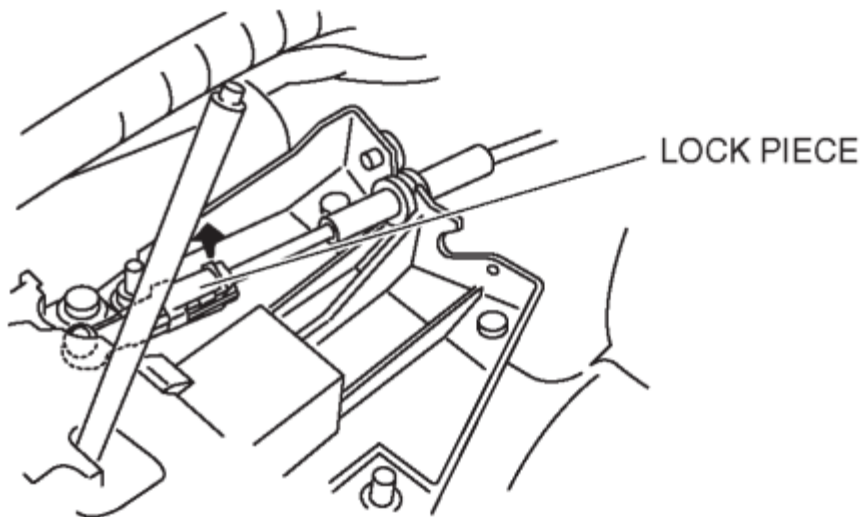
**CAUTION:**

- Do not connect the brake switch connector until the interlock cable adjustment is completed.

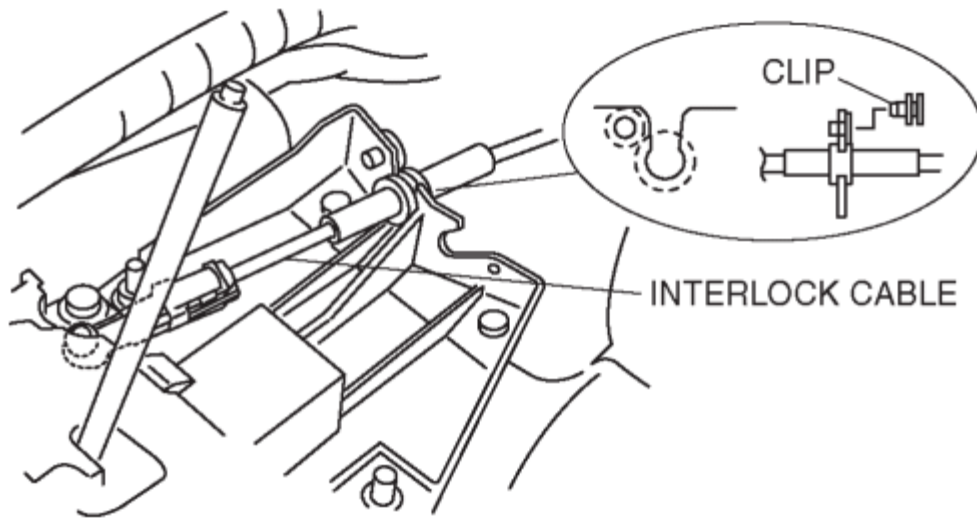
13. Install the lock unit to the bracket. (See [SELECTOR LEVER REMOVAL/INSTALLATION](#).)
14. Rotate the slider pin to release the lock, and verify that it slides freely.
15. Verify that the slider pin contacts the brake pedal stopper rubber and rotate the slider pin to lock.



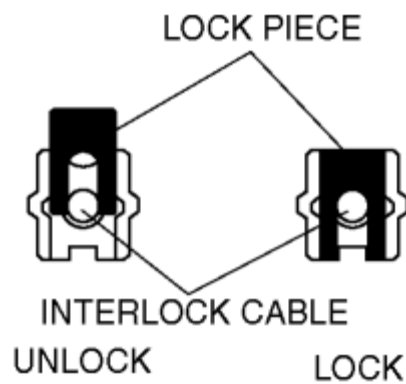
16. Install the interlock cable end to the interlock link on the selector lever.



17. Fit the interlock cable in the U-groove in the selector lever base plate and install the clip.



18. Press the interlock cable lock piece in until it is locked.

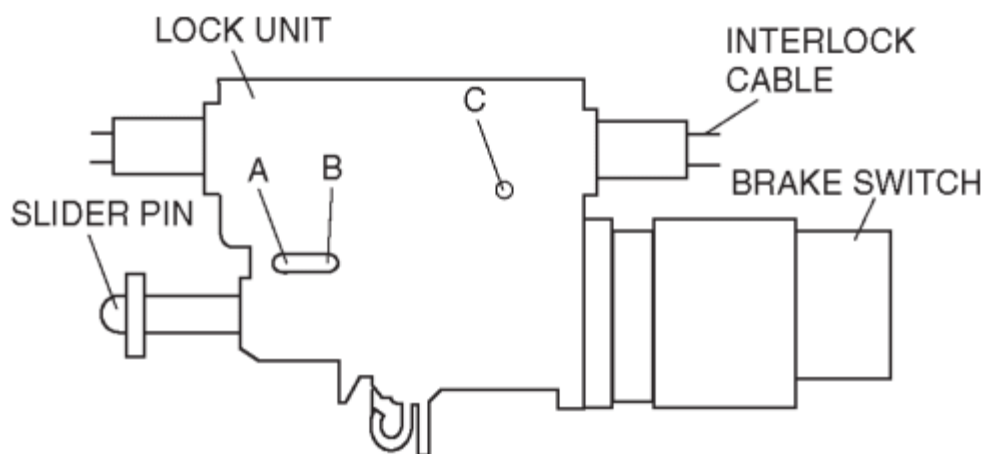


**CAUTION:**

- Applying a load to the interlock cable while pressing the lock piece in can affect the lock unit operation.

19. Remove a **1.5 mm {0.06 in}** round bar or similar from the lock unit hole A, B and C.

20. Connect the brake switch connector with the brake pedal released.



**CAUTION:**

- The clearance between the brake switch and the brake pedal is automatically

adjusted to the correct amount when the brake switch connector is connected after the brake switch has been properly installed. If the brake switch is not properly installed or the connector is connected before installation, the clearance may be incorrect, causing a brake light malfunction. Therefore, always verify that the brake switch is properly installed before connecting the connector.

- Once the brake switch clearance has automatically been adjusted, it cannot be adjusted again. Therefore, replace the switch with a new one when replacing the power brake unit or the pedal, or performing any procedure that changes the pedal stroke.

21. Inspect shift lock operation. (See **SHIFT LOCK INSPECTION**.)

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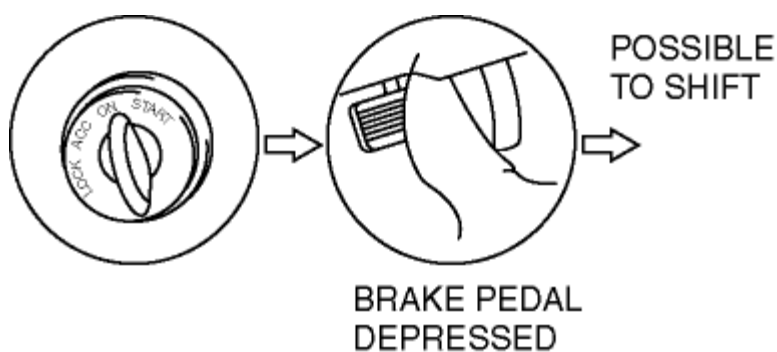
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## 2008 - MX-5 - Transmission/Transaxle

### SHIFT LOCK INSPECTION

1. Turn the ignition switch to the ON position (engine off).
2. Verify that the selector lever is in the P position.
3. Without the brake pedal depressed, verify that the selector lever cannot be shifted the P position.

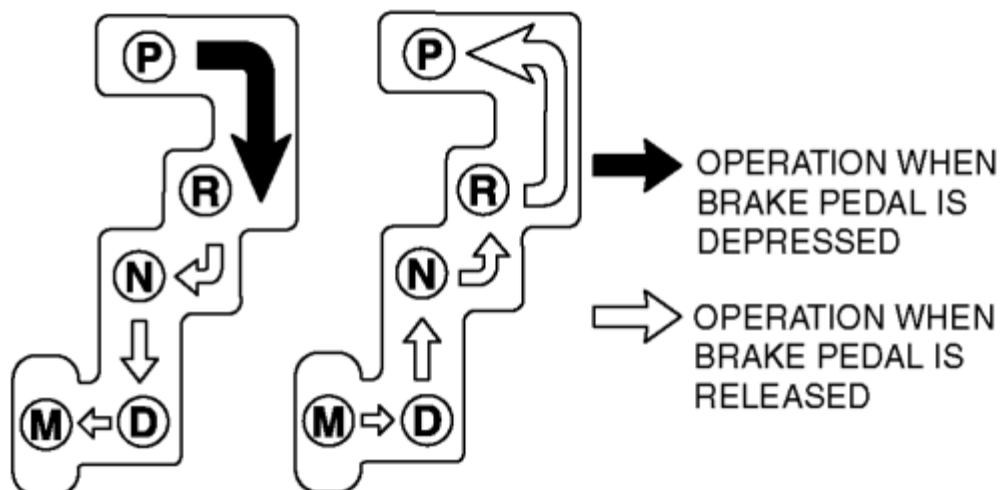


4. Depress the brake pedal and verify that the selector lever can be shifted from the P position.
  - If there is any malfunction, adjust the interlock cable. (See [INTERLOCK CABLE ADJUSTMENT](#).)

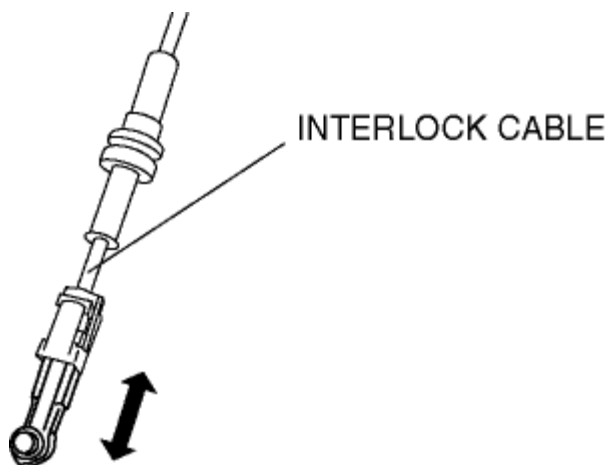
## 2008 - MX-5 - Transmission/Transaxle

### SELECTOR LEVER INSPECTION

1. Turn the ignition switch to the ON position (engine off).
2. With the brake pedal depressed, verify that there is a “click” at each range when shifted.



3. Verify that the selector lever can be shifted.
4. Verify that there is a “click” at each position when shifted from the P position to the M range.
5. Verify that the positions of the selector lever and the indicator are aligned.



- If there is any malfunction, adjust the TR switch. (See [TRANSMISSION RANGE \(TR\) SWITCH ADJUSTMENT \[SJ6A-EL\]](#).)

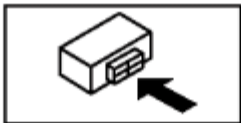
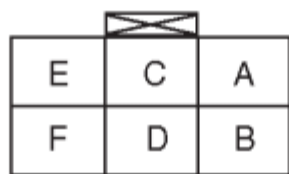
6. Verify that the vehicle operates in each selected range.



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SELECTOR LEVER COMPONENT INSPECTION

- 1. Remove the battery cover.
- 2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
- 3. Remove the shift knob. (See [SELECTOR LEVER REMOVAL/INSTALLATION.](#))
- 4. Remove the console panel and indicator assembly. (See [SELECTOR LEVER REMOVAL/INSTALLATION.](#))
- 5. Disconnect the selector lever component connector.
- 6. Verify continuity as indicated in the table.



- If there is any malfunction, replace the selector lever. (See [SELECTOR LEVER REMOVAL/INSTALLATION.](#))

○ — ○ : Continuity

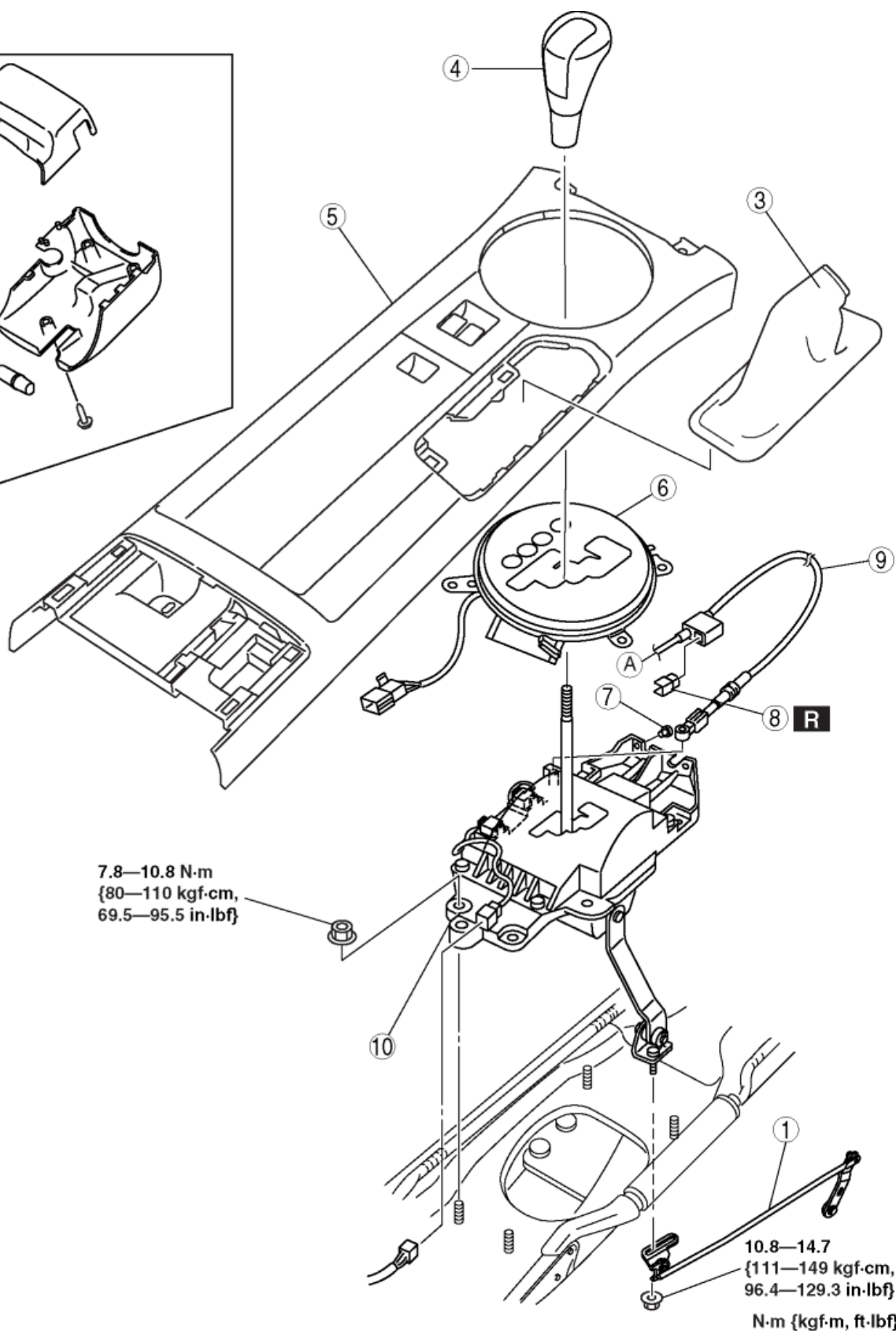
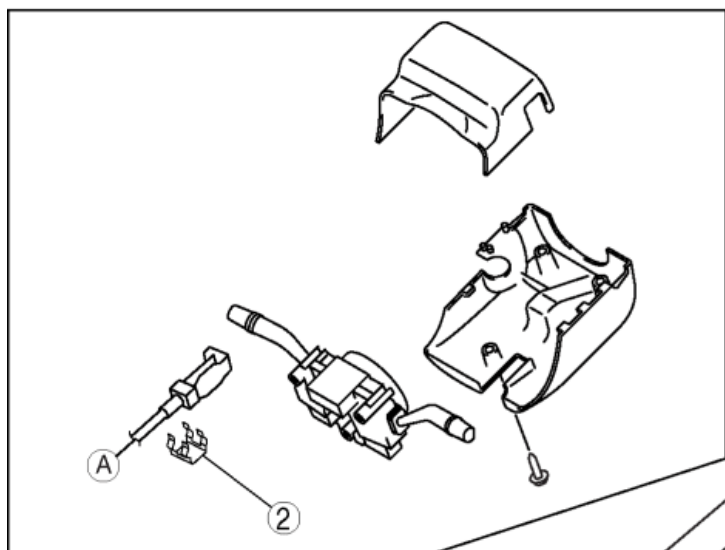
Selector lever position/range		Connector terminal					
		A	B	C	D	E	F
M range	Up switch	○ — ○			○		
	Down switch	○ — ○					○
	Other	○ — ○					
Other							

## 2008 - MX-5 - Transmission/Transaxle

### SELECTOR LEVER REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the following parts.
  - a. Side wall (See [SIDE WALL REMOVAL/INSTALLATION.](#))
  - b. Column cover (See [COLUMN COVER REMOVAL/INSTALLATION.](#))
  - c. Driver-side air bag module (See [DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.](#))
  - d. Steering shaft (See [STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.](#))
  - e. Audio unit (See [CENTER PANEL UNIT REMOVAL/INSTALLATION.](#))
  - f. SAS control module (See [SAS CONTROL MODULE REMOVAL/INSTALLATION.](#))
  - g. Tunnel member component
  - h. Middle pipe (See [EXHAUST SYSTEM REMOVAL/INSTALLATION \[LF\].](#))
  - i. Insulator (See [TRANSMISSION RANGE \(TR\) SWITCH REMOVAL/INSTALLATION \[SJ6A-EL\].](#))
4. Shift the selector lever to the P position.
5. Remove in the order indicated in the table.
6. Install in the reverse order of removal.
7. After installation, perform the shift lock inspection and key interlock inspection. (See [SHIFT LOCK INSPECTION.](#)) (See [KEY INTERLOCK INSPECTION.](#))





1 Manual shaft lever component

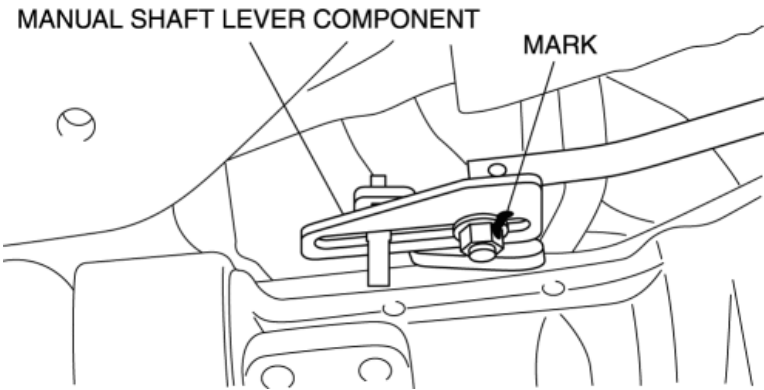
(See [Manual Shaft Lever Component Removal Note.](#))

(See [Manual Shaft Lever Component Installation Note.](#))

2	Clip
3	Boot panel (See <a href="#">CONSOLE REMOVAL/INSTALLATION.</a> )
4	Shift knob
5	Console panel (See <a href="#">CONSOLE REMOVAL/INSTALLATION.</a> )
6	Indicator component
7	Clip
8	Brake switch (See <a href="#">BRAKE PEDAL REMOVAL/INSTALLATION.</a> )
9	Interlock cable ( <a href="#">Interlock Cable Installation Note.</a> )
10	Selector lever component

**Manual Shaft Lever Component Removal Note**

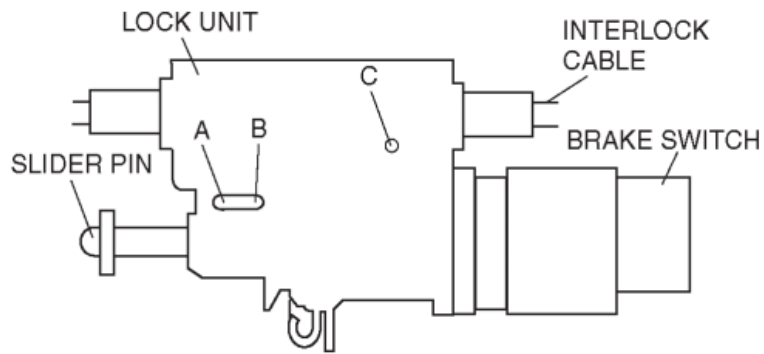
- 1. Mark the manual shaft lever component as shown in the figure.



- 2. Remove the manual shaft lever component installation nut.

**Interlock Cable Installation Note**

- 1. Push a **1.5 mm {0.06 in}** round bar or similar into hole A by fully pushing the slider pin in.

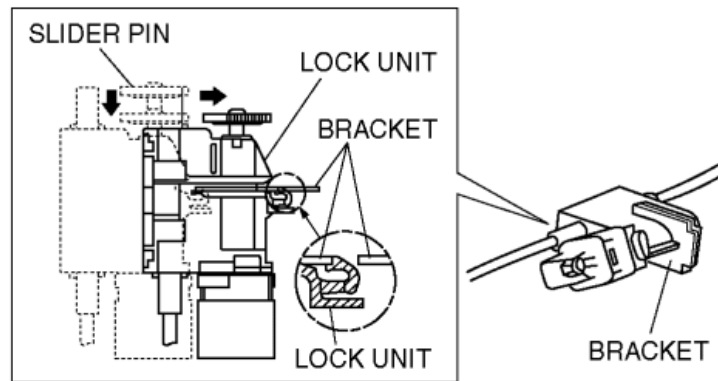


2. Push a **1.5 mm {0.06 in}** round bar or similar into hole B and hole C of the lock unit until it passes through.
3. Install the new brake switch. (See [BRAKE PEDAL REMOVAL/INSTALLATION](#).)

**CAUTION:**

- Do not connect the brake switch connector until the interlock cable is installed.

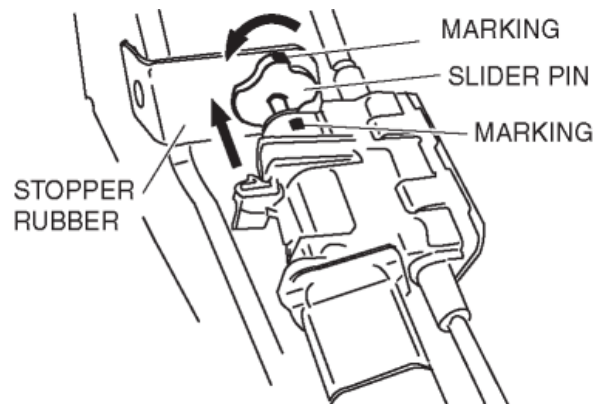
4. With the slider pin pressed, slide the lock unit to fix the lock unit hook into the bracket hole securely as shown in the figure.



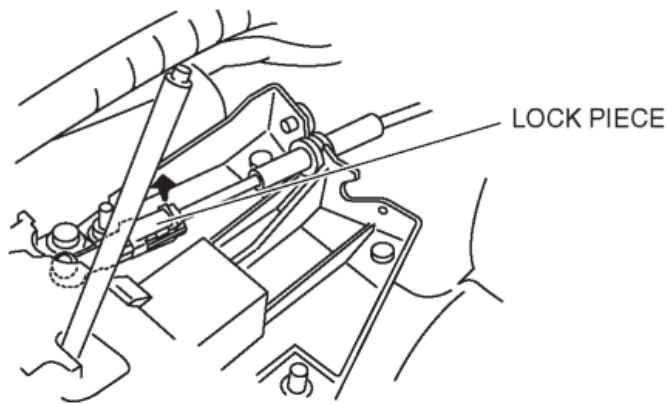
**CAUTION:**

- Allowing the interlock cable to be bent or twisted during installation can affect the lock unit operation.

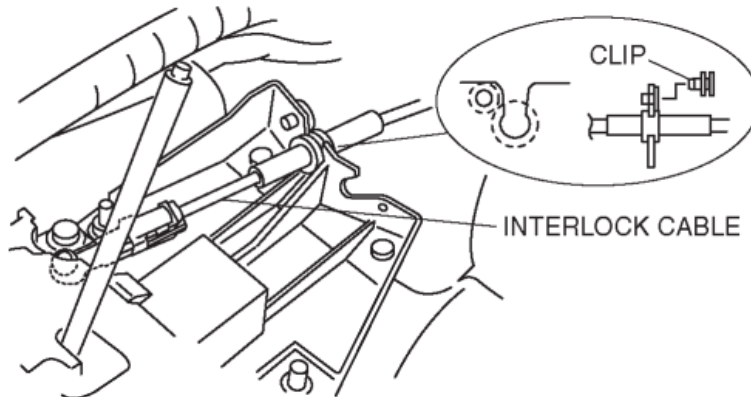
5. Rotate the slider pin to release the lock, and verify that it slides freely.
6. Pull the slider pin outward until it contacts the brake pedal stopper rubber and rotate the slider pin to lock.



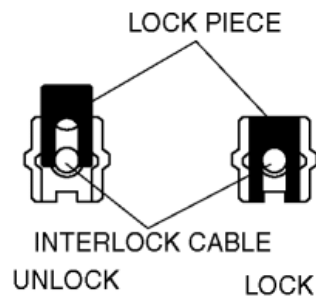
7. Verify that the shift the selector lever in P position.
8. Install the interlock cable end to the cam pin on the selector lever.



9. Fit the interlock cable in the U-groove in the selector lever base plate, and install the clip.



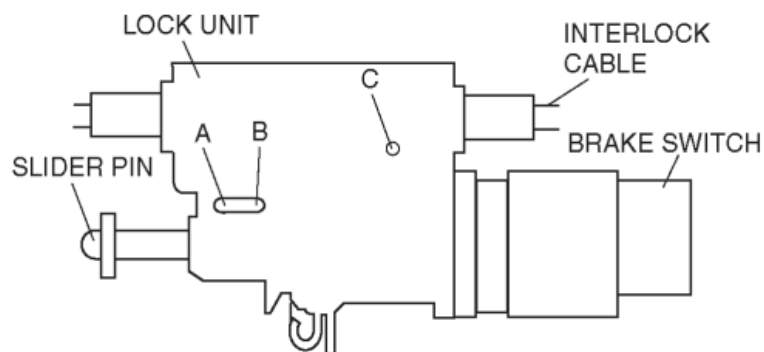
10. Press the interlock cable lock piece in until it is locked.



**CAUTION:**

- Applying a load to the interlock cable while pressing the lock piece in can affect the lock unit operation.

11. Remove a **1.5 mm {0.06 in}** round bar or similar from the lock unit hole A, B and C.



12. Connect the brake switch connector with the brake pedal released.

**CAUTION:**

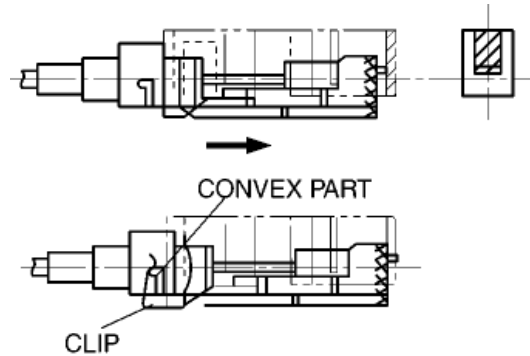
The clearance between the brake switch and the brake pedal is automatically adjusted to the correct amount when the brake switch connector is connected after the brake switch has been properly installed. If the brake switch is not properly installed or the connector is connected before installation, the clearance may be incorrect, causing a brake light malfunction. Therefore, always verify that the brake switch is properly installed before connecting the connector.

- Once the brake switch clearance has automatically been adjusted, it cannot be adjusted again. Therefore, replace the switch with a new one when replacing the power brake unit or the pedal, or performing any procedure that changes the pedal stroke.

13. Turn the ignition switch to ON position.

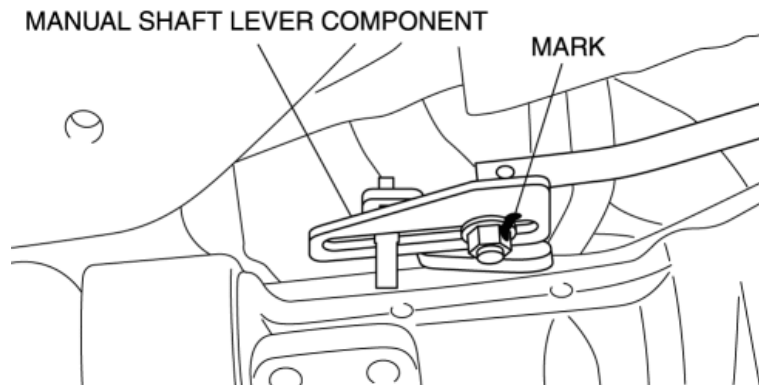
14. Install the interlock cable to the key cylinder.

15. Slide the outer casing to the key cylinder, and insert the clip over the convex part of the outer casing.



#### Manual Shaft Lever Component Installation Note

1. Align the mark of the manual shaft lever component as shown in the figure.



2. Install the manual shaft lever component installation nut.

#### Tightening torque

- 10.8—14.7 N·m { 111—149 kgf·cm, 96.4—129.3 in·lbf }

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## 2008 - MX-5 - Transmission/Transaxle

### STEERING SHIFT SWITCH REMOVAL/INSTALLATION

#### NOTE:

- The down switch is built into the audio control switch.
1. Remove the steering shift switch. (See [AUDIO CONTROL SWITCH REMOVAL/INSTALLATION](#).)
  2. Install in the reverse order of removal.

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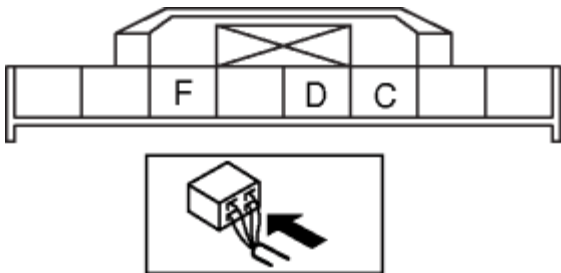
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STEERING SHIFT SWITCH INSPECTION

1. Remove the driver-side air bag module. (See [DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.](#))
2. Connect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Turn the ignition switch to ON position.
4. Measure the voltage at the steering shift switch.
  - When inspecting terminal C for continuity, disconnect the steering shift switch connector.
5. If the value are not as specified in the Terminal Voltage List (Reference), inspect the parts under "Action" and related wiring harnesses.
6. If the parts inspected under "ACTION" are found to be normal but the system still does not operate normally, replace the up or down switch according to the following conditions:
  - The voltage is normal when the up switch is on and is abnormal when the down switch is on: Replace the down switch.
  - The voltage is normal when the down switch is on and is abnormal when the up switch is on: Replace the up switch.

Terminal Voltage List (Reference)



Terminal	Signal	Connected to	Test condition	Voltage (V)/ Continuity	Action
C	Steering shift switch ground	GND	Under any condition: inspect for continuity to ground	Yes	<ul style="list-style-type: none"><li>Inspect GND</li></ul>

D	TNS	<ul style="list-style-type: none"><li>• Clock spring</li><li>• Headlight switch</li></ul>	Headlight switch TNS or on		B+	<ul style="list-style-type: none"><li>• Inspect clock spring</li><li>• Inspect headlight switch</li><li>• Inspect related harness</li></ul>
			Headlight switch off		Below 1.0	
F	Shift change signal	<ul style="list-style-type: none"><li>• Clock spring</li><li>• TCM</li></ul>	M range	Up switch and down switch off	3.96	<ul style="list-style-type: none"><li>• Inspect clock spring</li><li>• Inspect TCM</li><li>• Inspect related harness</li></ul>
				Up switch on	1.95	
				Down switch on	2.48	
				Up switch and down switch on	1.50	



## 2008 - MX-5 - Transmission/Transaxle

### TRANSMISSION/TRANSAXLE TECHNICAL DATA

#### Clutch

Item	Specification
Clutch fluid	SAE J1703, FMVSS 116 DOT-3
Clutch pedal stroke	130 mm {5.12 in}
Clutch pedal play	5—15 mm {0.20—0.59 in}
Clutch pedal push rod play	At push rod setting line: 0.1—0.5 mm {0.004—0.020 in} (Reference value) At pedal pad: 0.5—2.7 mm {0.020—0.106 in}
Clutch disengagement stroke (Reference value)	A: 80—110 mm {3.15—4.33 in}
Clutch disc maximum depth	0.6 mm {0.024 in}
Clutch cover maximum clearance	0.5 mm {0.020 in}
Clutch cover maximum height difference	1.0 mm {0.039 in}
Clutch disc minimum depth	0.3 mm {0.012 in}
Clutch disc maximum runout	0.7 mm {0.028 in}
Flywheel maximum runout	0.1 mm {0.004 in}

#### Manual Transmission [M15M-D]

Item	Specification
Specified oil grade	API Service GL-4 or GL-5
Specified oil viscosity	All season: SAE 75W-90 Above 10°C {50°F}: SAE 80W-90
Capacity (approx. quantity)	2.0 L {2.1 US qt, 1.8 Imp qt}
Vehicle speed sensor (VSS) voltage	4.5—5.5 V
Shift control case specified oil grade	API Service GL-4 or GL-5
Shift control case specified oil viscosity	SAE 75W-90
Shift control case capacity (approx. quantity)	290—330 ml {290—330 cc, 17.69—20.13 cu in}

### Manual Transmission [P66M-D]

Item	Specification
Transmission case specified oil grade	API Service GL-4
Transmission case specified oil viscosity	SAE 75W-90
Transmission case capacity (approx. quantity)	2.1 L {2.2 US qt, 1.8 Imp qt}
Vehicle speed sensor (VSS) voltage	4.5—5.5 V
Shift control case specified oil grade	API Service GL-4
Shift control case specified oil viscosity	SAE 75W-90
Shift control case capacity (approx. quantity)	80—230 ml {80—230 cc, 4.88—14.03 cu in}

### Automatic Transmission [SJ6A-EL]

Item	Specification
Time lag	N position → D range: 0.7 s or less N position → R position: 1.2 s or less
ATF	Type: JWS3309 Capacity (approx. quantity): 7.4 L {7.8 US qt, 6.5 Imp qt}
Turbine sensor resistance	560—680 ohm
VSS resistance	560—680 ohm
Distance A between end of torque converter and face of converter housing	26.2 mm {1.03 in}

### Line pressure

Position/Range		Specification (kPa {kgf/cm <sup>2</sup> , psi})
D, M	Idle	355—425 {3.7—4.3, 52—61}
	Stall	863—959 {8.8—9.7, 126—139}
R	Idle	804—942 {8.2—9.6, 117—136}
	Stall	1,424—1,608 {14.6—16.3, 207—233}

### Engine stall speed

Position/Range	Specification (rpm)
D, R, M	2,307—2,607

### Transmission fluid temperature (TFT) sensor

ATF temperature (°C {°F})	Resistance (kilohm)
10 {50}	6.445

25 { 77 }	3.5
110 { 230 }	0.247

**Solenoid valve resistance (ATF temperature: 20 °C { 68 °F })**

Terminals	Solenoid valve	Resistance (ohm)
O—GND	Shift solenoid A	5.0—5.6
N—GND	Shift solenoid B	5.0—5.6
M—GND	Shift solenoid C	5.0—5.6
L—GND	Shift solenoid D	5.0—5.6
K—GND	Shift solenoid E	5.0—5.6
E—F	Shift solenoid F	5.0—5.6
C—D	Shift solenoid G	5.0—5.6
I—J	Line pressure control solenoid	5.0—5.6
G—H	TCC control solenoid	5.0—5.6

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## 2008 - MX-5 - Transmission/Transaxle

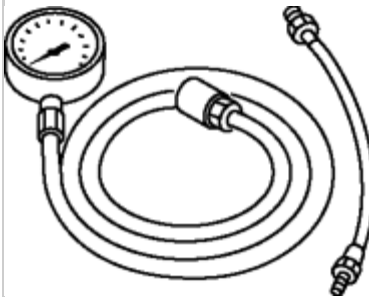
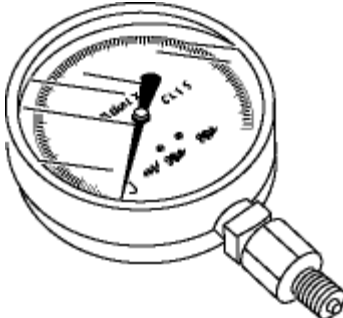
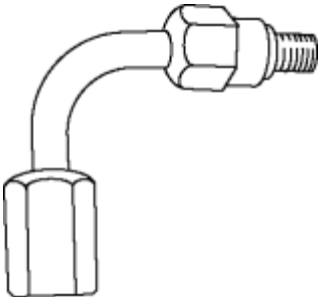
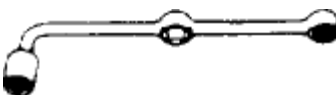

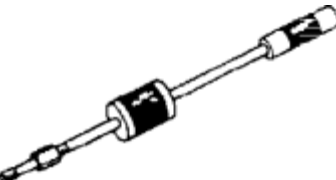
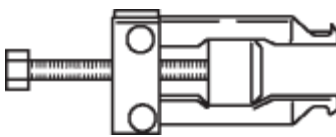
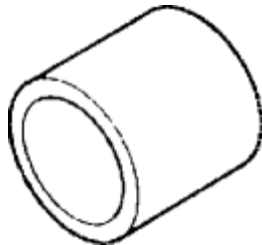
### TRANSMISSION/TRANSAXLE SST

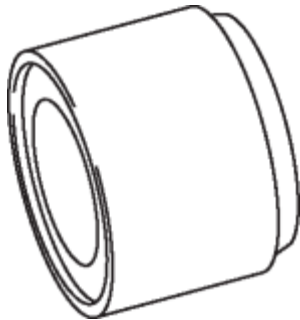
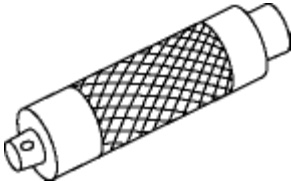
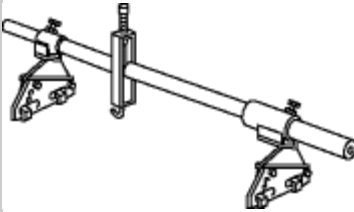
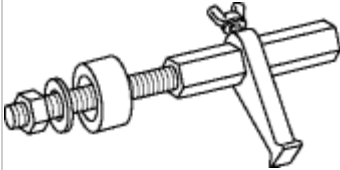

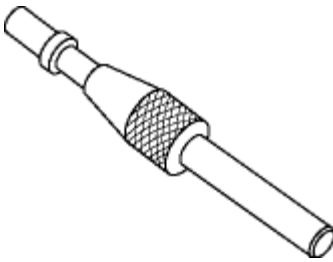


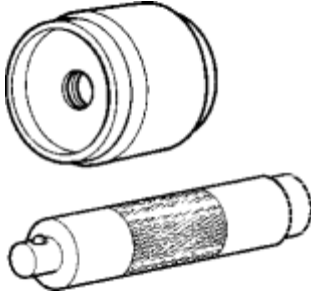

1: Mazda SST number

2: Global SST number

#### Example

1: 49 UN30 3009	
2: 303-009	
Crankshaft damper remover	

1: 49 0378 400C		1: 49 B019 901B		1: 49 HD64 406A	
2: -		2: -		2: -	
Oil pressure gauge set		Oil pressure gauge		Adapter	
1: 49 0877 435		1: 49 S120 440		1: 49 0813 215A	
2: -		2: -		2: -	
Wrench		Mainshaft holder		Dowel puller and oil pump puller	
1: 49 S019 005		1: 49 W027 003		1: 49 S019 006	
2: -		2: -		2: -	
Oil seal puller		Bearing installer		Oil seal installer	

					
1:49 G030 797  2: –  Handle		1:49 E017 5A0  2: –  Engine support		1:49 E011 1A0  2: –  Ring gear brake set	
1:49 0259 770B  2: 205  Flare nut wrench		1:49 SE01 310A  2: –  Clutch disc centering tool		1:49 1285 071  2: –  Needle bearing puller	
1:49 B025 004  2: –  Installer, dust seal		1:49 B025 0A0  2: –  Dust seal installer set		1:49 0259 440  2: –  Mainshaft holder	

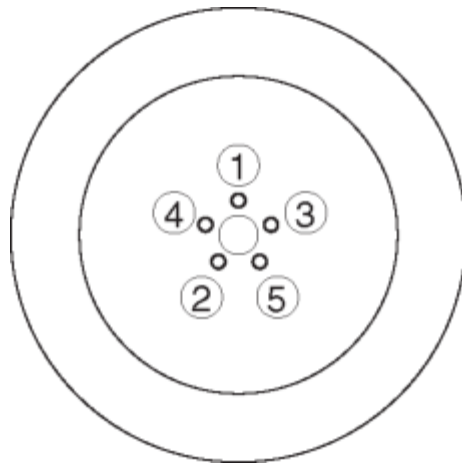
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## 2008 - MX-5 - Steering

### GENERAL PROCEDURES (STEERING)

#### Wheels and Tire Installation

1. When installing the wheels and tires, tighten the wheel nuts in a criss-cross pattern to the following tightening torque.



#### Tightening torque

- 88—118 N·m { 9.00—12.0 kgf·m, 65.0—87.0 ft·lbf }

#### Connector Disconnection

1. Disconnect the negative battery cable before performing any work that requires handling of connectors. (See [BATTERY REMOVAL/INSTALLATION\[LF\]](#).)

#### Power Steering Components Removal/Installation

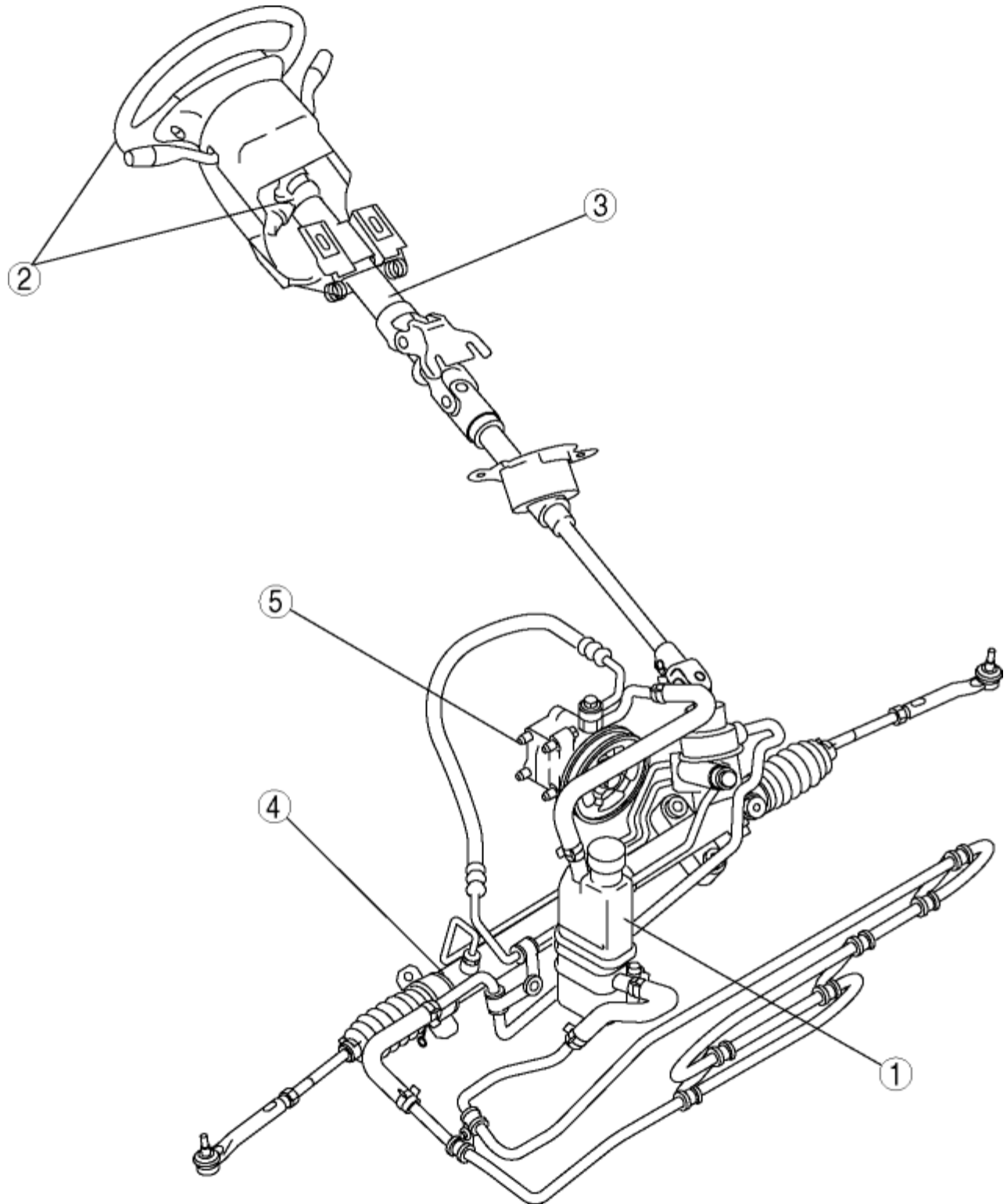
1. If any power steering fluid line has been disconnected anytime during the procedure, add ATF M III or equivalent (e.g. Dexron<sup>®</sup> II), bleed the fluid lines, and inspect for leakage after the procedure has been completed.

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## 2008 - MX-5 - Steering

### STEERING LOCATION INDEX





1	Power steering fluid tank (See <a href="#">POWER STEERING FLUID INSPECTION.</a> )
2	Steering wheel and column (See <a href="#">STEERING WHEEL AND COLUMN INSPECTION.</a> ) (See <a href="#">STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.</a> )
3	Steering shaft (See <a href="#">STEERING SHAFT INSPECTION.</a> )
4	Steering gear and linkage (See <a href="#">STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION.</a> ) (See <a href="#">STEERING GEAR AND LINKAGE DISASSEMBLY.</a> ) (See <a href="#">STEERING GEAR AND LINKAGE INSPECTION.</a> ) (See <a href="#">STEERING GEAR AND LINKAGE ASSEMBLY.</a> )
5	Power steering oil pump (See <a href="#">POWER STEERING OIL PUMP REMOVAL/INSTALLATION.</a> ) (See <a href="#">POWER STEERING OIL PUMP DISASSEMBLY/ASSEMBLY.</a> )

## 2008 - MX-5 - Steering

### AIR BLEEDING

#### CAUTION:

- Do not turn the steering wheel during the fluid level inspection, otherwise the fluid level changes and cannot be inspected correctly.
1. Inspect the fluid level. (See **POWER STEERING FLUID INSPECTION**.)
  2. Jack up the front of the vehicle and support it on safety stands.
  3. Turn the steering wheel fully to the left and right several times with the engine not running.
  4. Reinspect the fluid level.
    - If it has dropped, add fluid.
  5. Repeat Steps 3 and 4 until the fluid level stabilizes.
  6. Lower the vehicle.
  7. Start the engine and let it idle.
  8. Turn the steering wheel fully to the left and right several times.
  9. Verify that the fluid is not foamy and that the fluid level has not dropped.
    - If the fluid level has dropped, add fluid as necessary and repeat Steps 8 and 9.

## 2008 - MX-5 - Steering

### STEERING WHEEL AND COLUMN INSPECTION

#### Steering Wheel Play Inspection

1. With the wheels in the straight ahead position, gently turn the steering wheel to the left and right and verify that the play is within the specification.

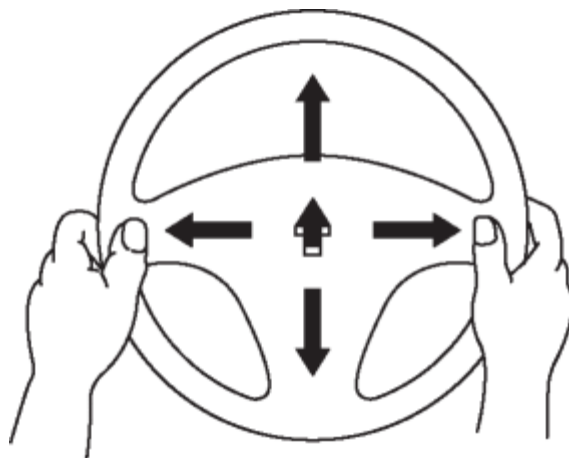
- If the play exceeds the specification, either the steering joints are worn or the backlash of the steering gear is excessive. Correct as necessary.

##### Steering wheel play

- 0—30 mm {0—1.18 in}

#### Steering Wheel Looseness Inspection

1. Move the steering wheel as shown in the figure to inspect for column bearing wear, steering shaft joint play, steering wheel looseness, and column looseness.



- Repair or replace as necessary.

#### Steering Wheel Effort Inspection

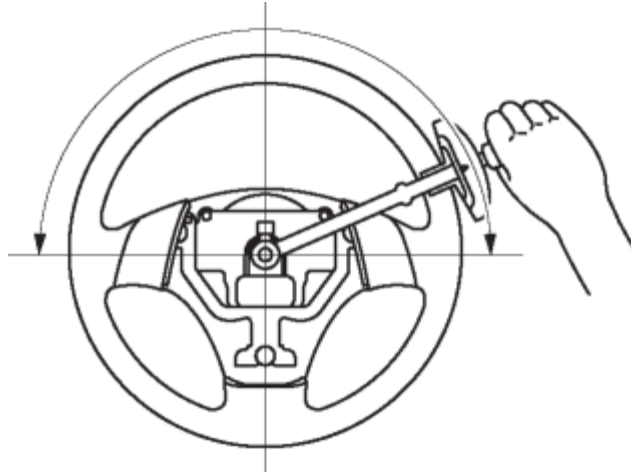
1. Inspect the following points:

- Tire size and tire pressure
- Fluid level
- Drive belt deflection

2. With the vehicle on a hard, level surface, put the wheels in the straight ahead position.
3. Remove the air bag module.

**WARNING:**

- Handling the air bag module improperly can accidentally deploy the air bag module, which may seriously injure you. Read AIR BAG SYSTEM WARNINGS before handling the air bag module. (See **AIR BAG SYSTEM SERVICE WARNINGS**.) (See **AIR BAG SYSTEM SERVICE CAUTIONS**.)
4. Start the engine and warm the power steering fluid to **50—60 °C {122—140 °F}**.
  5. Measure the steering wheel effort using a torque wrench.



- If not within the specification, verify the following:
  - No air in steering system
  - No fluid leakage at hose or connectors
  - Function of oil pump and steering gear

**Steering wheel effort**

- 7.8 N·m {80 kgf·cm, 58 in·lbf} max.

**NOTE:**

- To determine whether the steering effort is satisfactory or not, perform the inspection on another vehicle of the same model and under the same conditions, and compare the results.
- The steering wheel effort varies with conditions as shown below.
  - Road conditions, such as dry or wet, and asphalt or concrete.
  - Tire conditions, such as brand, wear, and tire pressure.

## 2008 - MX-5 - Steering

### POWER STEERING FLUID INSPECTION

#### Fluid Level Inspection

1. Inspect the power steering fluid level.
  - Add fluid to the specified level as necessary.

#### **Power steering fluid type**

- ATF M III or equivalent (e.g. Dexron® II)

#### **Power steering fluid capacity (approximate quantity)**

- 1.19 L { 1.25 US qt, 1.04 Imp qt }

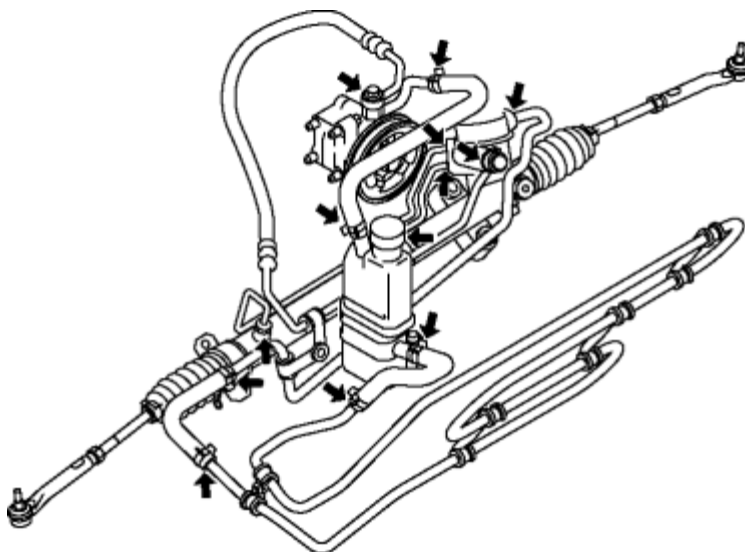
#### Fluid Leakage Inspection

1. Start the engine and let it idle.
2. Turn the steering wheel fully to the left and right to apply fluid pressure.

#### **CAUTION:**

- If the steering wheel is kept in the fully turned position for more than 5 seconds, the fluid temperature will rise excessively and adversely affect the oil pump.

3. Inspect for fluid leakage.



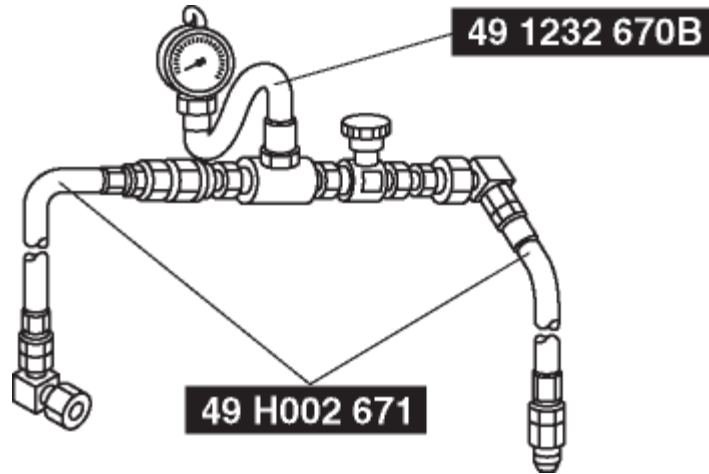
If fluid leakage is found, replace related pipe or hose.

**NOTE:**

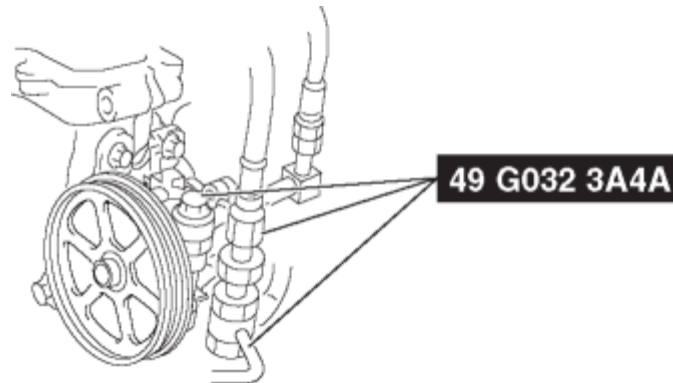
- The points where fluid leakage may occur are indicated in the figure.

## Fluid Pressure Inspection

1. Assemble the **SSTs** as shown in the figure.



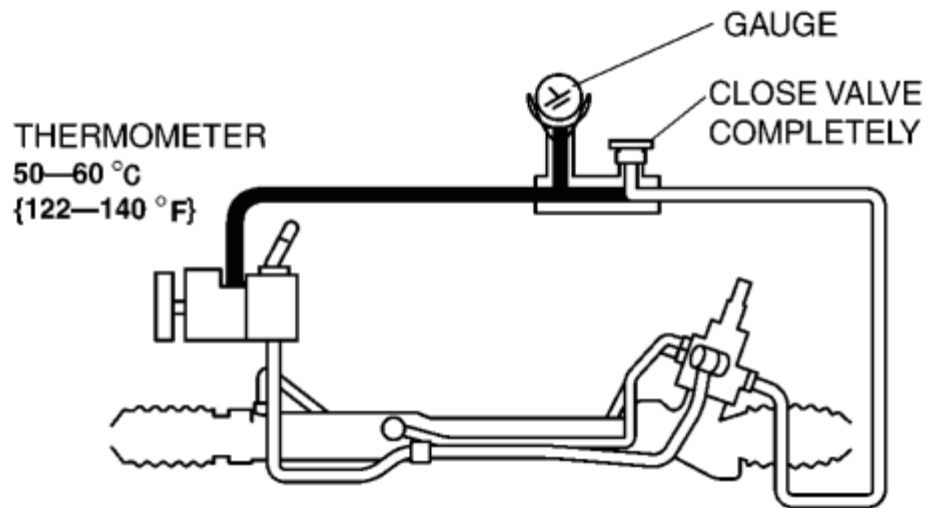
2. Disconnect the pressure pipe from the oil pump, and connect the **SSTs**.



### Tightening torque

- 29.4—44.1 N·m {3.00—4.49 kgf·m, 21.7—32.5 ft·lbf}

3. Bleed the air from the system. (See **AIR BLEEDING**.)
4. Open the gauge valve fully.
5. Start the engine and turn the steering wheel fully left and right to raise the fluid temperature to **50—60 °C {122—140 °F}**.
6. Close the gauge valve completely.



7. Increase the engine speed to **1,000—1,500 rpm** and measure the fluid pressure generated by the oil pump.

- If the pressure is not within the specification, repair or replace the oil pump component.

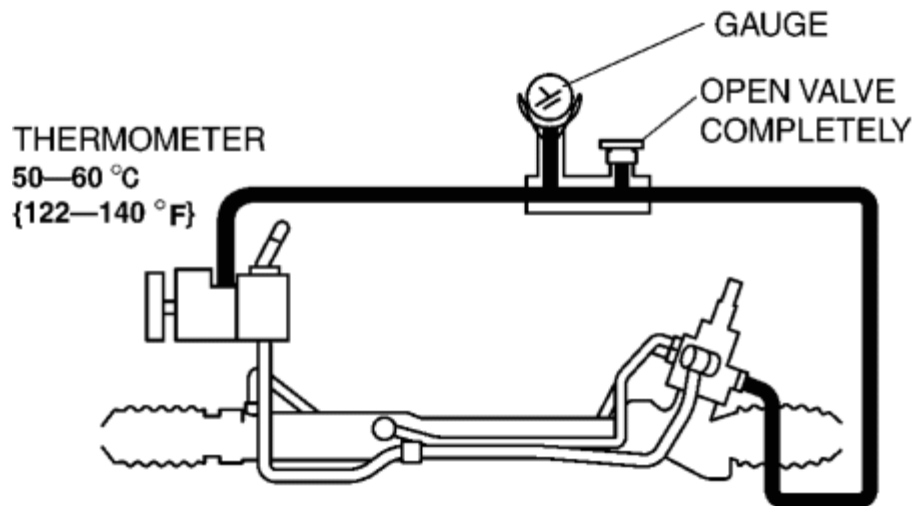
**CAUTION:**

- If the valve is left closed for more than 5 seconds, the fluid temperature will rise excessively and adversely affect the oil pump.

**Oil pump fluid pressure**

- 7.55—8.05 MPa {77.0—82.0 kgf/cm<sup>2</sup>, 1095—1167 psi}

8. Open the gauge valve fully and increase the engine speed to **1,000—1,500 rpm**.



9. Turn the steering wheel fully to the left and right, then measure the fluid pressure generated at the gear housing.

- If the pressure is not within the specification, repair or replace the steering gear component.

**CAUTION:**

- If the steering wheel is kept in the fully turned position for more than 5 seconds, the fluid temperature will rise excessively and adversely affect the oil pump.

### **Gear housing fluid pressure**

- 7.55—8.05 MPa {77.0—82.0 kgf/cm<sup>2</sup>, 1095—1167 psi}

10. Remove the **SSTs**. Install and tighten the pressure pipe to the specified torque.

### **Tightening torque**

- 29.4—44.1 N·m {3.00—4.49 kgf·m, 21.7—32.5 ft·lbf}

11. Bleed the air from the system.

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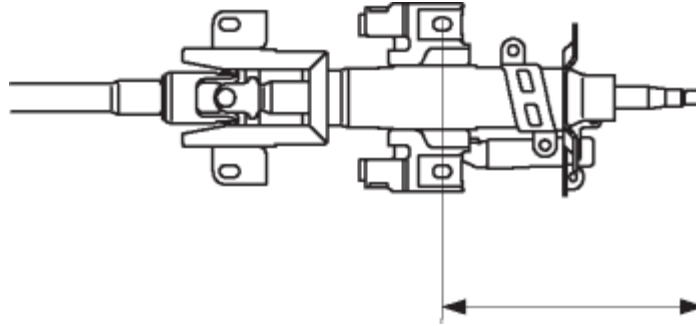
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## 2008 - MX-5 - Steering

### STEERING SHAFT INSPECTION

1. Inspect the following.



a. Column bearing for damage

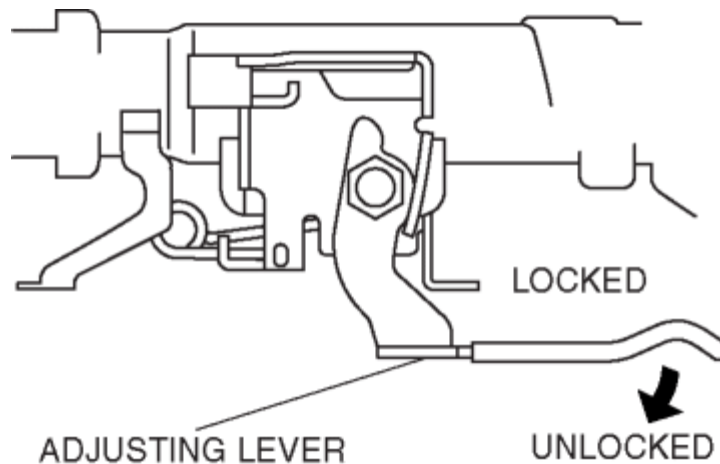
b. Steering shaft length

- Replace the steering shaft component as necessary.

#### **Steering shaft length**

- 247.3 mm {9.736 in}

2. Inspect the tilt operation.



a. Verify that the adjusting lever moves smoothly from unlock position to lock position.

b. Verify that the steering shaft is fixed firmly when the adjusting lever is locked.

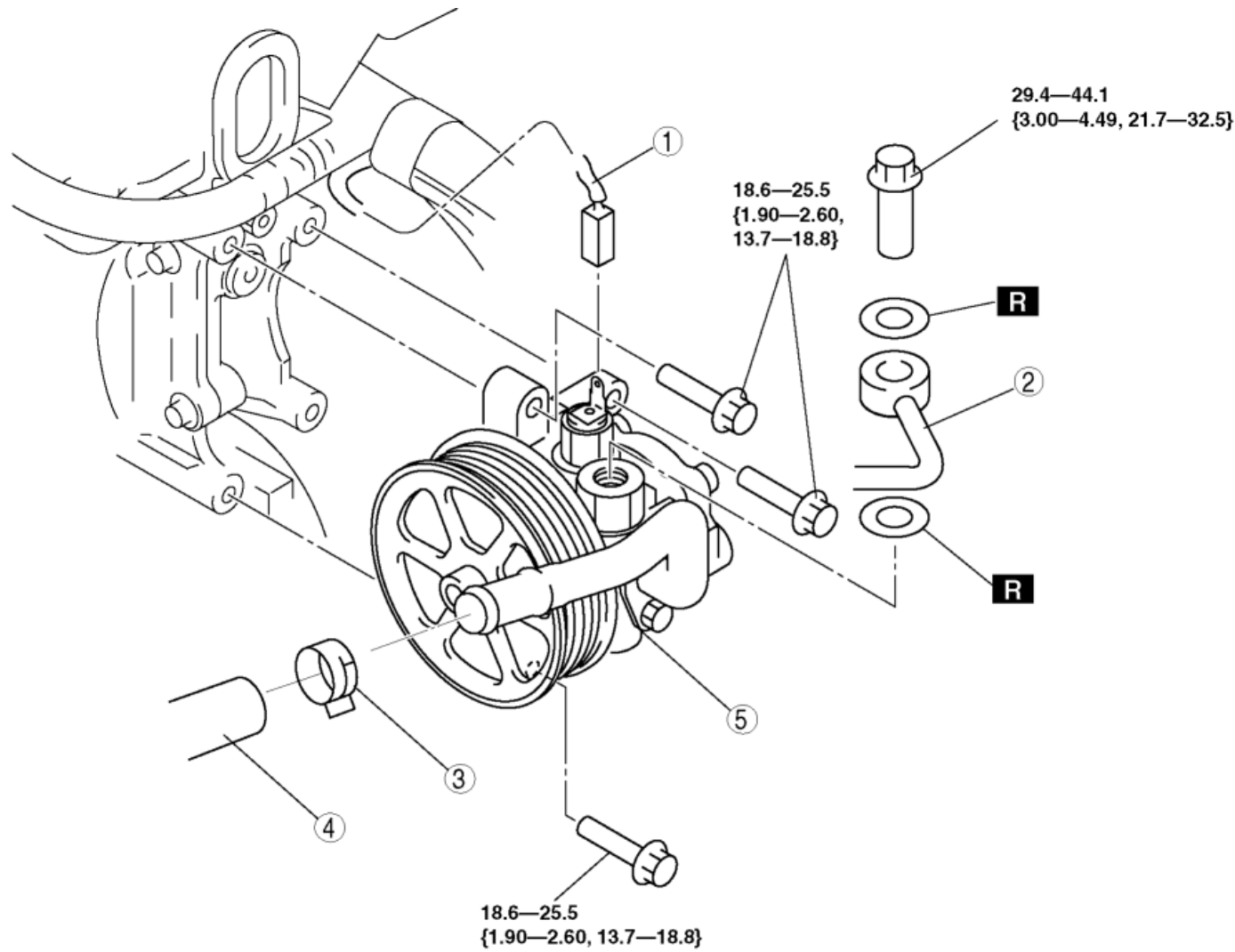
- Replace the steering shaft component as necessary.



2008 - MX-5 - Steering

POWER STEERING OIL PUMP REMOVAL/INSTALLATION

- 1. Remove the drive belt. (See [DRIVE BELT REPLACEMENT\[LF\]](#).)
- 2. Remove in the order indicated in the table.
- 3. Install in the reverse order of removal.



N·m {kgf·m, ft·lbf}

1	Pressure switch connector
2	Pressure pipe
3	Hose band
4	Return hose
5	Power steering oil pump



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## 2008 - MX-5 - Steering

### POWER STEERING OIL PUMP DISASSEMBLY/ASSEMBLY

#### NOTE:

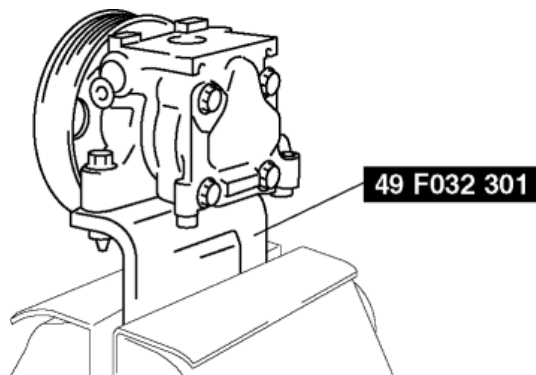
- The following procedure is for replacement of the O ring and oil seal only. Replace the pump component if other repairs are necessary.
1. Disassemble in the order indicated in the table.
  2. Assemble in the reverse order of disassembly.



6	Spring
7	Suction pipe
8	O ring
9	Rear pump body (See <a href="#">Rear Pump Body Assembly Note.</a> )
10	Gasket
11	Clip
12	Cam ring (See <a href="#">Cam Ring Assembly Note.</a> )
13	Rotor
14	Vane (See <a href="#">Vane Assembly Note.</a> )
15	Side plate
16	O rings
17	Shaft component
18	Oil seal (See <a href="#">Oil Seal Assembly Note.</a> )
19	Front pump body

### Power Steering Oil Pump Component Disassembly Note

1. Secure the power pressure oil pump using the **SST**.

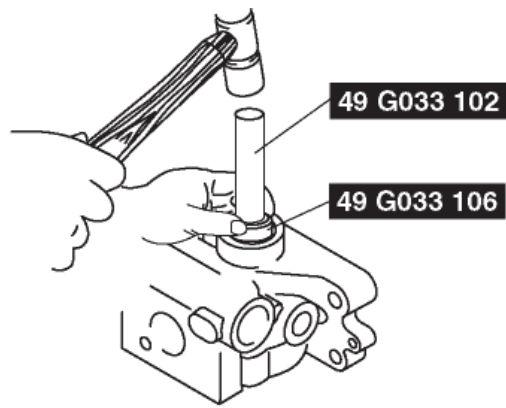


#### CAUTION:

- Use the SST to prevent damage to the pump when securing it in a vise.

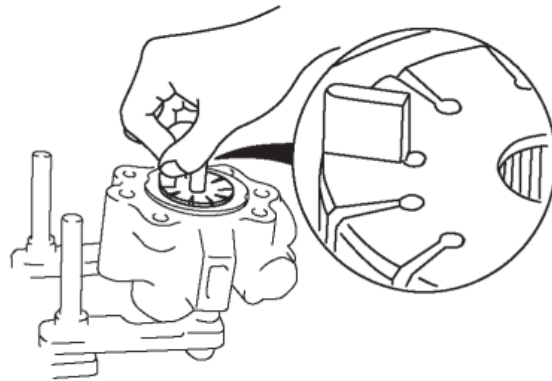
### Oil Seal Assembly Note

1. Install the oil seal in the front pump body using the **SST** and plastic hammer.



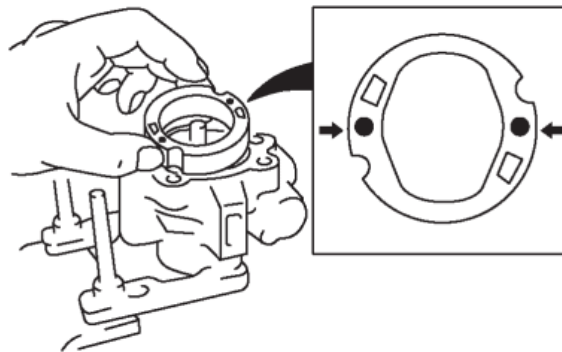
### Vane Assembly Note

1. Place the vanes in the rotor with the rounded edges contacting the cam.



### Cam Ring Assembly Note

1. Install the cam ring in the front pump body with the mark facing upward.



### Rear Pump Body Assembly Note

1. After installing the rear body, manually turn the shaft to verify that it rotates smoothly.

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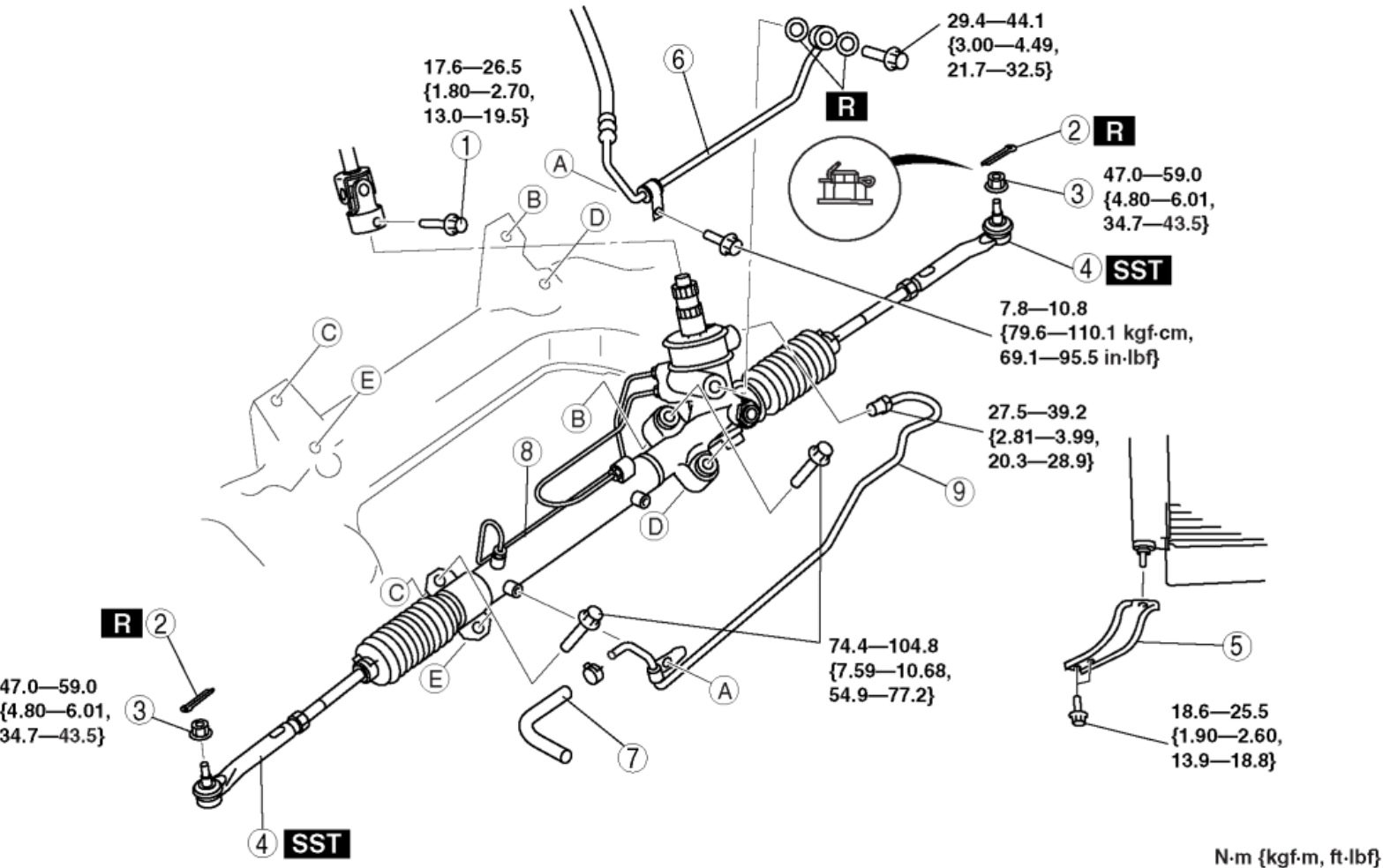


2008 - MX-5 - Steering

STEERING GEAR AND LINKAGE REMOVAL/INSTALLATION

CAUTION:

- Performing the following procedures without first removing the ABS wheel speed sensor may possibly cause an open circuit in the harness if it is pulled by mistake. Before performing the following procedures, remove the ABS wheel speed sensor (axle side) and fix it to an appropriate place where the sensor will not be pulled by mistake while servicing the vehicle.
1. Remove the ABS wheel-speed sensor. (See [FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION.](#))
  2. Remove the front stabilizer. (See [FRONT STABILIZER REMOVAL/INSTALLATION.](#))
  3. Remove in the order indicated in the table.
  4. Install in the reverse order of removal.
  5. After installation, adjust the total toe-in. (See [FRONT WHEEL ALIGNMENT.](#))

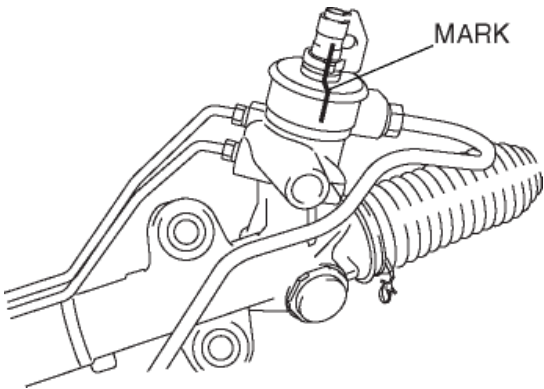


1 Bolt (intermediate shaft)
(See <a href="#">Bolt (Intermediate Shaft) Removal Note.</a> )
(See <a href="#">Bolt (Intermediate Shaft) Installation Note.</a> )
2 Cotter pin

3Nuts (tie rod end ball joint)
4Tie rod end ball joint (See <a href="#">Tie-rod End Ball Joint Removal Note.</a> )
5Lower mounting rubber bracket
6Pressure pipe
7Return hose
8Steering gear and linkage (See <a href="#">Steering Gear and Linkage Removal Note .</a> ) (See <a href="#">Steering Gear and Linkage Installation Note.</a> )
9Return pipe

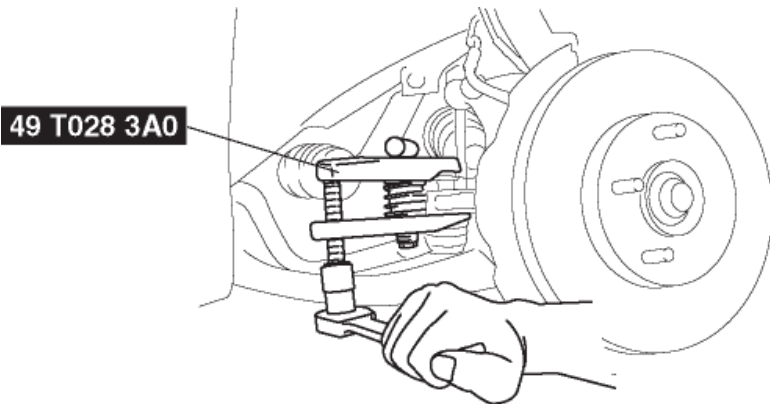
**Bolt (Intermediate Shaft) Removal Note**

- 1. Mark the pinion shaft and gear housing for proper installation.



**Tie rod End Ball Joint Removal Note**

- 1. Remove the tie-rod nut.
- 2. Separate the tie rod end from the steering knuckle using the **SSTs**.

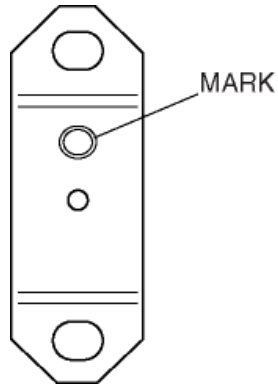


**Steering Gear and Linkage Removal Note**

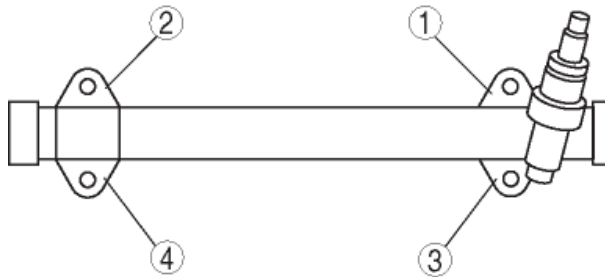
1. Remove the steering gear and linkage by pulling it from the right side.

### Steering Gear and Linkage Installation Note

1. Tighten bolts loosely.
2. Assemble the mounting bracket with the mark on the bracket facing the vehicle rear.



3. Tighten the mounting bracket bolts to the specified torque in the order shown.



#### Tightening torque

- 74.4—104.8 N·m {7.587—10.68 kgf·m, 54.88—77.29 ft·lbf}

### Bolt (Intermediate Shaft) Installation Note

1. Align the marks and install the intermediate shaft and bolt.

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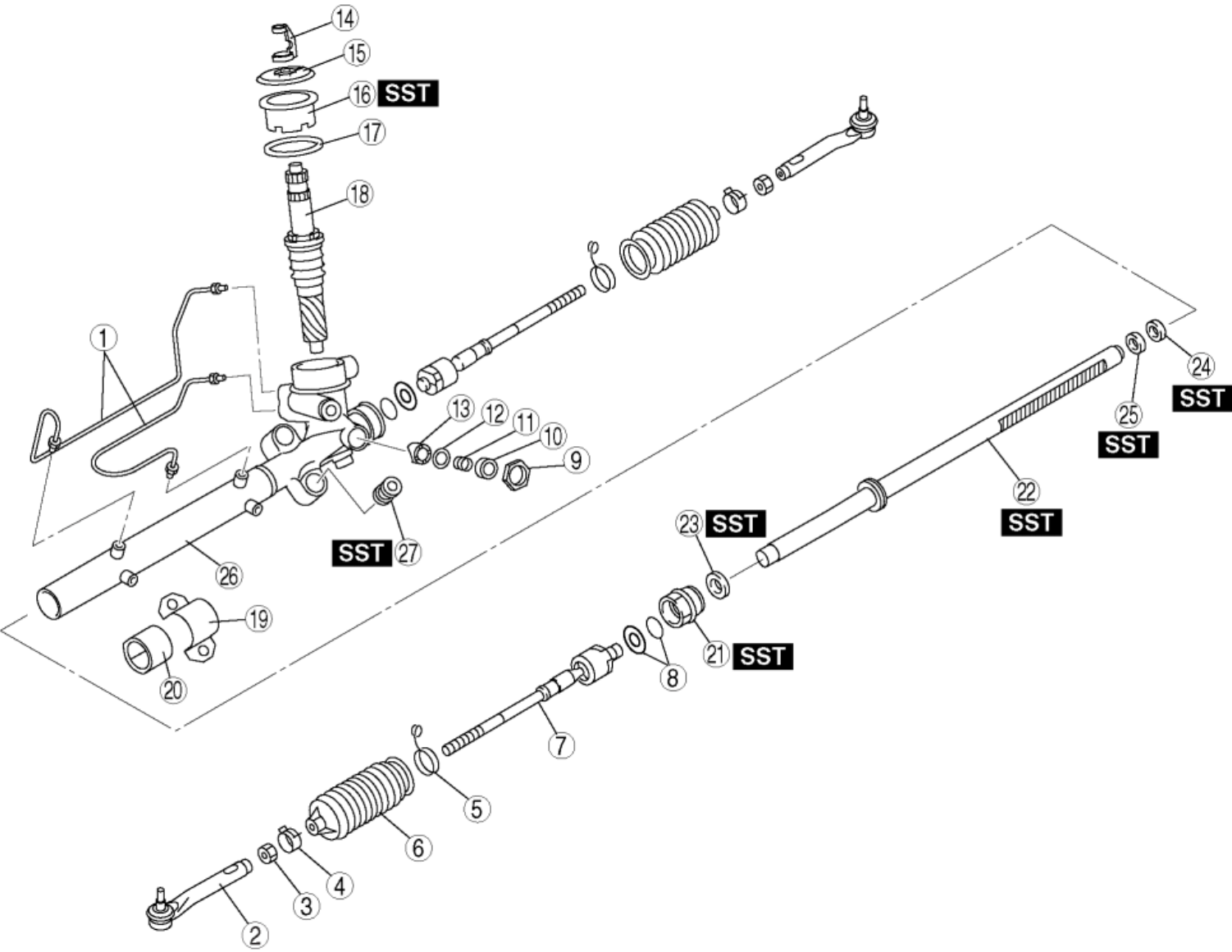
2008 - MX-5 - Steering

STEERING GEAR AND LINKAGE DISASSEMBLY

CAUTION:

- Place copper plates, rag, or similar material in a vise, when securing the mounting bracket portion of the steering gear.

1. Disassemble in the order indicated in the table.

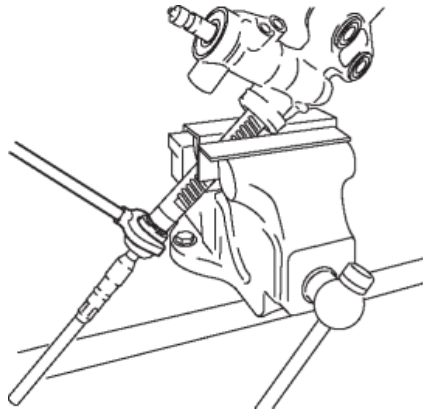


1	Oil pipe
2	Tie rod end
3	Locknut
4	Boot clamp
5	Boot band

6	Boot
7	Tie rod (See <a href="#">Tie Rod Disassembly Note.</a> )
8	Lock washer and o-ring
9	Locknut (adjusting cover)
10	Adjusting cover
11	Yoke spring
12	Washer
13	Support yoke
14	Clip
15	Dust cover
16	Pinion plug (See <a href="#">Pinion Plug, Pinion Shaft Component Disassembly Note.</a> )
17	O-ring
18	Pinion shaft component (See <a href="#">Pinion Plug, Pinion Shaft Component Disassembly Note.</a> )
19	Mounting bracket
20	Mounting rubber
21	Holder (See <a href="#">Holder Disassembly Note.</a> )
22	Steering rack (See <a href="#">Steering Rack, Oil Seal (Holder Side) Disassembly Note.</a> )
23	Oil seal (holder side) (See <a href="#">Steering Rack, Oil Seal (Holder Side) Disassembly Note.</a> )
24	Inner guide (See <a href="#">Oil Seal (Gear Housing Side), Inner Guide Disassembly Note.</a> )
25	Oil seal (gear housing side) (See <a href="#">Oil Seal (Gear Housing Side), Inner Guide Disassembly Note.</a> )
26	Gear housing
27	Mounting rubber (See <a href="#">Mounting Rubber Disassembly Note.</a> )

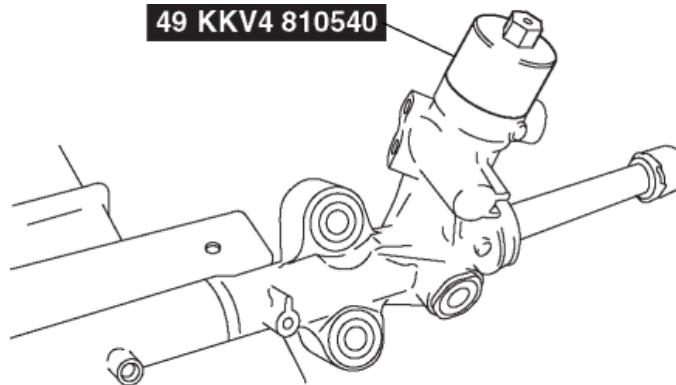
### Tie Rod Disassembly Note

1. Unclamp the washer.
2. Remove the tie rod.

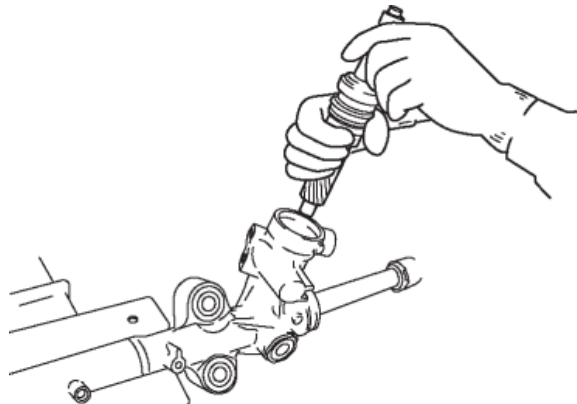


### Pinion Plug, Pinion Shaft Component Disassembly Note

1. Remove the clip and the dust cover, then remove the pinion plug using the **SST**.

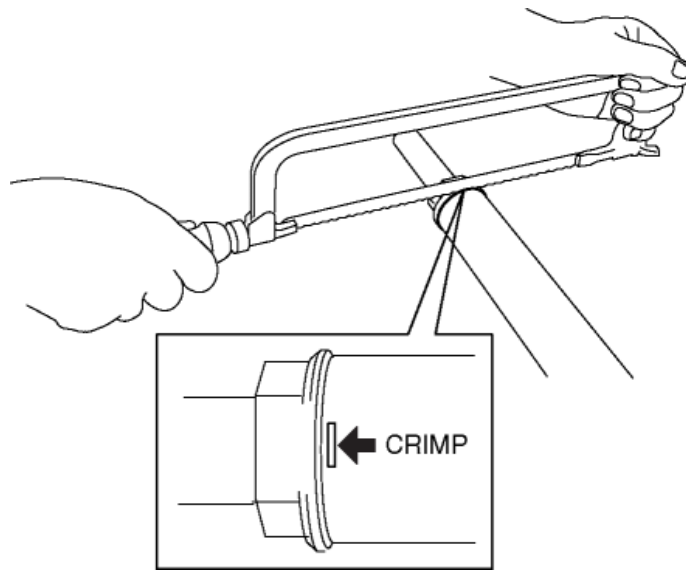


2. Remove the pinion shaft component from the gear housing.

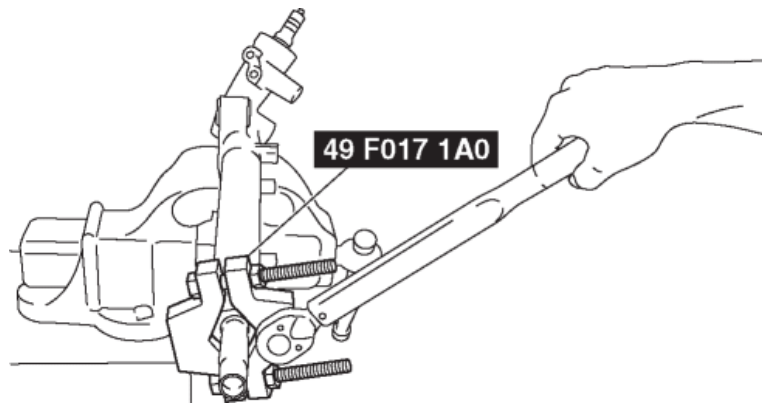


### Holder Disassembly Note

1. Remove the crimp from the holder and cylinder ends using a hacksaw.

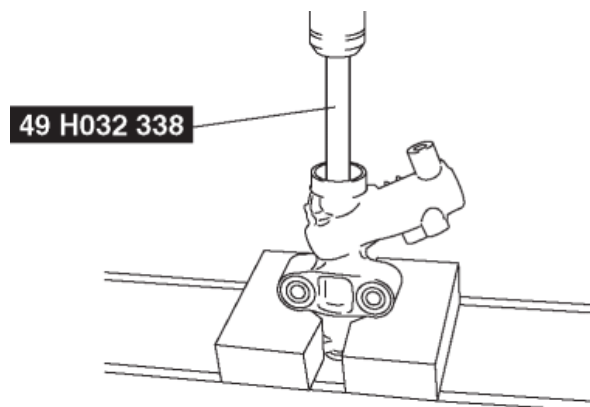


2. Remove the holder using the **SST**.



#### Steering Rack, Oil Seal (Holder Side) Disassembly Note

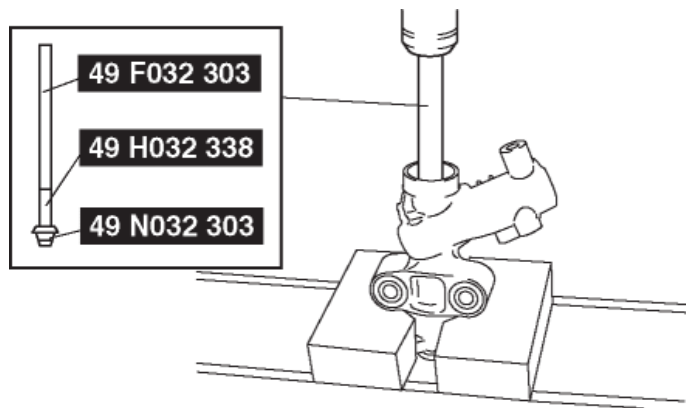
1. Install the **SST** to the gear housing.
2. Remove the steering rack and oil seal (holder side) using a press.



3. Remove the oil seal (holder side) from the steering rack.

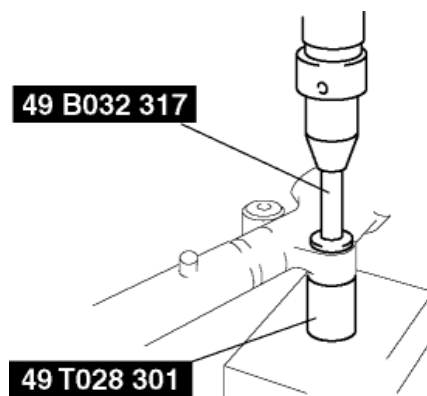
#### Oil Seal (Gear Housing Side), Inner Guide Disassembly Note

1. Set the **SSTs** as shown.
2. Install the **SST** to the gear housing.
3. Remove the oil seal (gear housing side) and inner guide using a press.



#### Mounting Rubber Disassembly Note

- Press the mounting rubber out from the gear housing using the **SSTs** and a press.



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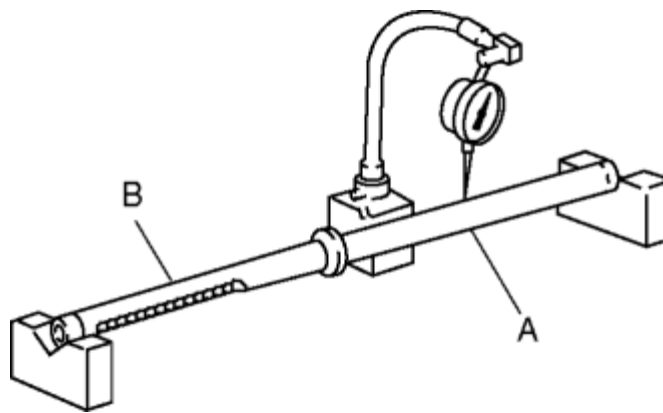


## 2008 - MX-5 - Steering

### STEERING GEAR AND LINKAGE INSPECTION

#### Rack Inspection

1. Inspect the rack for cracking, damage, and tooth wear. Replace it if necessary.
2. Measure the runout of the rack.

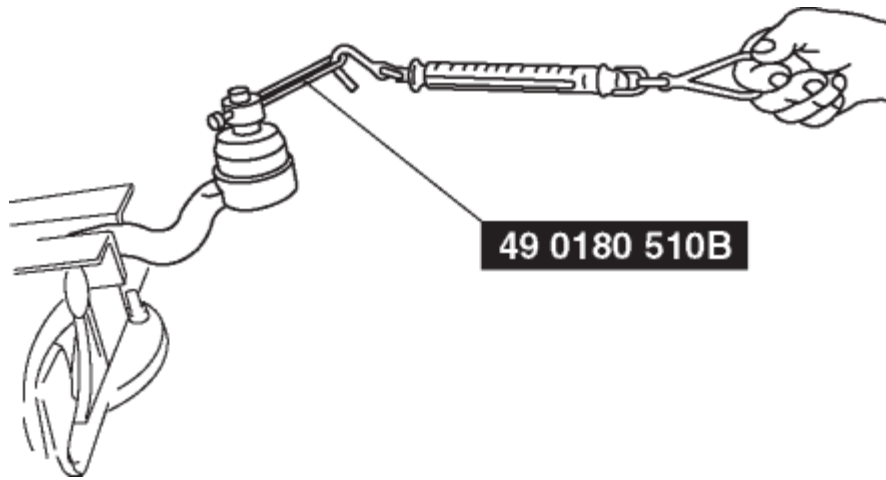


#### Steering rack runout

- Near point A: 0.08 mm {0.003 in} max.
  - Near point B: 0.15 mm {0.006 in} max.
3. If not within the specification, replace the rack.

#### Tie rod End Inspection

1. Inspect the tie rod end for damage and boot cracks. Replace it if necessary.
2. Inspect the ball joint for looseness. Replace the tie rod end if necessary.
3. Rotate the ball joint five times.
4. Measure the rotation torque of the ball joint using the **SST** and a pull scale.



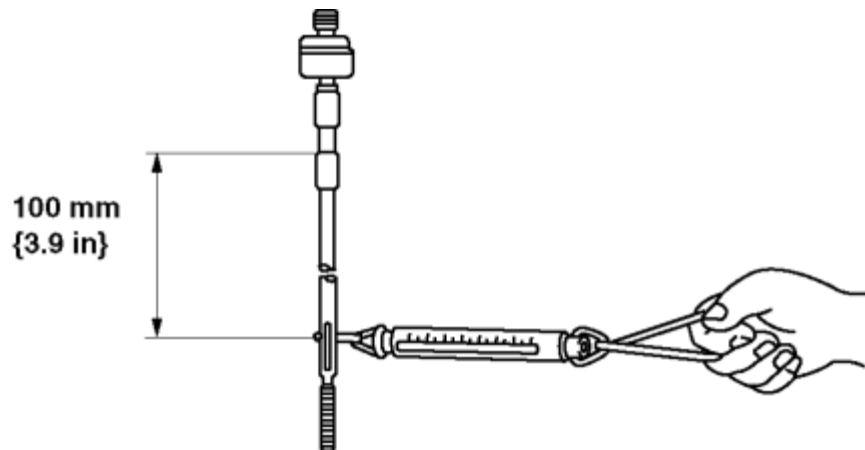
### Tie-rod end rotational torque

- 0.4—3.0 N·m {3.5—30.5 kgf·cm, 3.1—26.5 in·lbf}
- [Pull scale reading: 3.5—29.9 N {0.35—3.05 kgf, 0.8—6.7 lbf}]

5. If not within the specification, replace the tie rod end.

### Tie rod Inspection

1. Inspect the tie rod for bending and damage. Replace it if necessary.
2. Inspect the ball joint for looseness. Replace the tie rod if necessary.
3. Swing the tie rod five times.
4. Measure the swinging torque using a pull scale.



### Tie-rod swing torque

- 0.1—4.1 N·m {1.1—41.8 kgf·cm, 1.0—36.2 in·lbf}
- [Pull scale reading: 0.6—24.4 N {0.06—2.49 kgf, 0.2—5.4 lbf}]

5. If not within the specification, replace the tie rod.



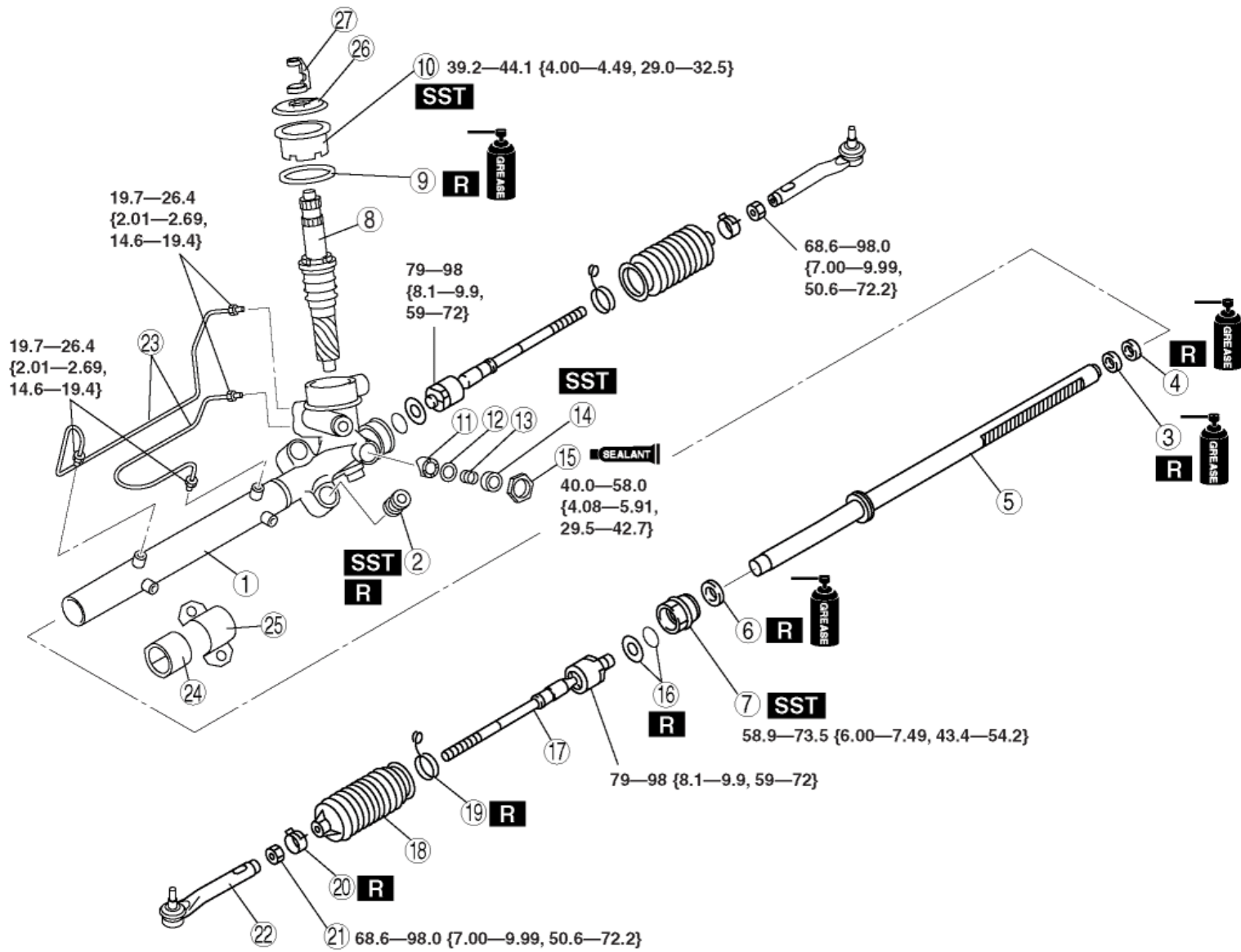
2008 - MX-5 - Steering

STEERING GEAR AND LINKAGE ASSEMBLY

CAUTION:

- Place copper plates, rag, or similar material in a vise, when securing the mounting bracket portion of the steering gear.

1. Assemble in the order indicated in the table.



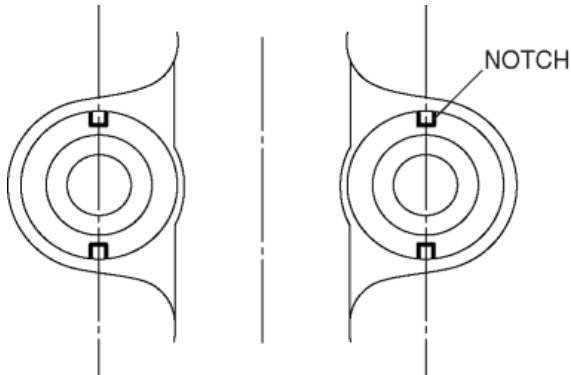
N·m {kgf·m, ft·lb}

1	Gear housing
2	Mounting rubber (See <a href="#">Mounting Rubber Assembly Note.</a> )
3	Oil seal (gear housing side)

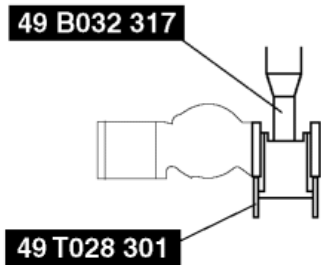
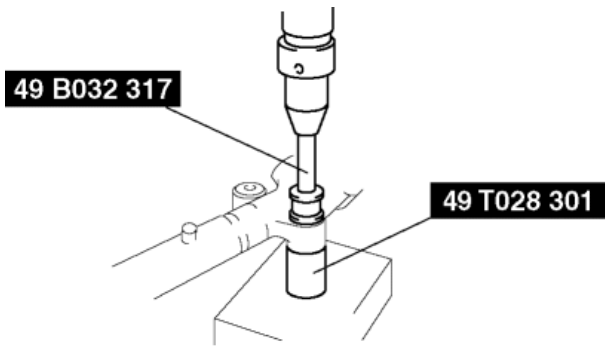
	(See <a href="#">Steering Rack, Oil Seal (Gear Housing Side), Inner Guide Assembly Note</a> .)
4	Inner guide (See <a href="#">Steering Rack, Oil Seal (Gear Housing Side), Inner Guide Assembly Note</a> .)
5	Steering rack (See <a href="#">Steering Rack, Oil Seal (Gear Housing Side), Inner Guide Assembly Note</a> .)
6	Oil seal (holder side) (See <a href="#">Oil Seal (Holder Side), Holder Assembly Note</a> .)
7	Holder (See <a href="#">Oil Seal (Holder Side), Holder Assembly Note</a> .)
8	Pinion shaft component
9	O ring
10	Pinion plug (See <a href="#">Pinion Plug Assembly Note</a> .)
11	Support yoke
12	Washer
13	Yoke spring
14	Adjusting cover (See <a href="#">Adjusting Cover Assembly Note</a> .)
15	Locknut (adjusting cover) (See <a href="#">Adjusting Cover Assembly Note</a> .)
16	Washer and O-ring
17	Tie rod
18	Boot
19	Boot band
20	Boot clamp
21	Locknut
22	Tie rod end
23	Oil pipe
24	Mounting rubber
25	Mounting bracket
26	Dust cover
27	Clip

**Mounting Rubber Assembly Note**

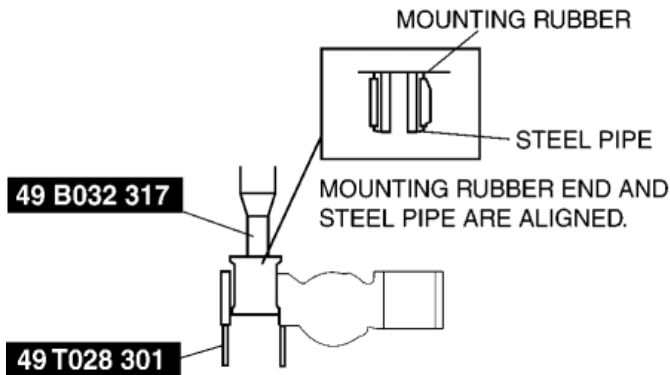
1. Install the mounting rubber so that two notches of mounting rubber are aligned to the steering rack.



2. Apply soapy water to the rubber part of the mounting rubber.
3. Press the mounting rubber until the mounting rubber end comes out completely from the gear housing using the **SSTs** and a press.

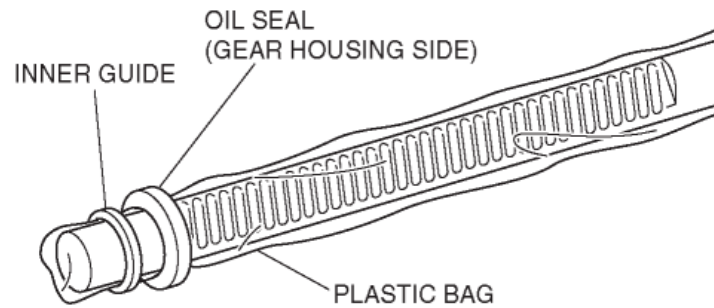


4. Reverse the gear housing, then press the mounting rubber until the mounting rubber end comes out completely from the other side. At this time, the mounting rubber end and steel pipe are aligned.



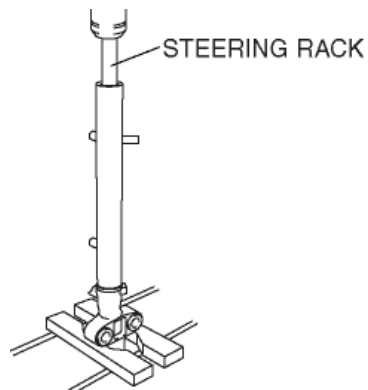
1. Apply multi-purpose grease to the oil seal (gear housing side) and Inner guide.

2. Install the plastic bag to the steering rack teeth so as not to damage the oil seal (gear housing side) and the inner guide, and install the oil seal (gear housing side) and the inner guide to the seal. Move the oil seal (gear housing side) and the inner guide together with the plastic bag so that they pass the steering rack teeth, then remove the plastic bag.



3. Put the steering rack into the gear housing.

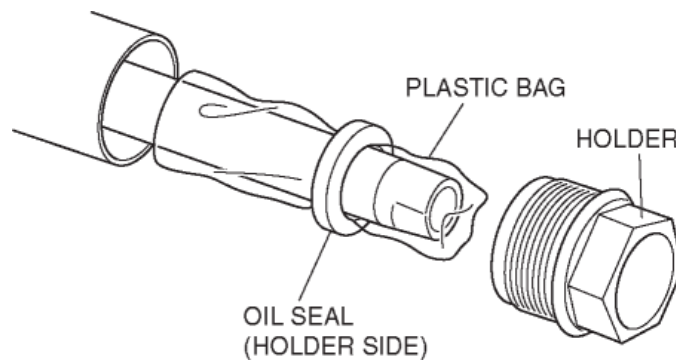
4. Using a press, press-in the oil seal (gear housing side) and inner guide until the press-in force increases rapidly.



#### Oil Seal (Holder Side), Holder Assembly Note

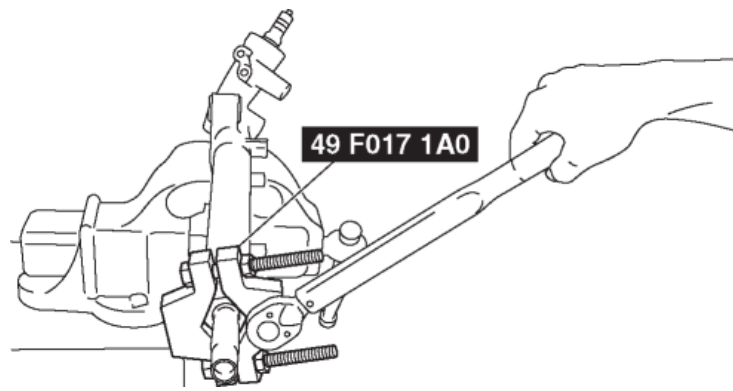
1. Apply multi-purpose grease to the oil seal holder side).

2. Install the plastic bag to the steering rack end so as not to damage the oil seal (holder side) and install the oil seal (holder side) to the seal. Move the oil seal (holder side) together with the plastic bag so that they pass the steering rack end, then remove the plastic bag.



3. Install the holder and move the steering rack until it contacts the housing.

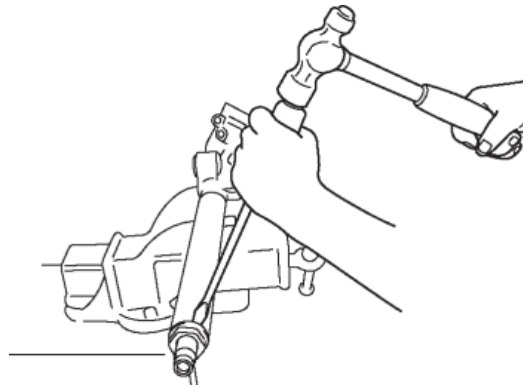
4. Tighten the holder to the specified torque using the **SST**.



#### Tightening torque

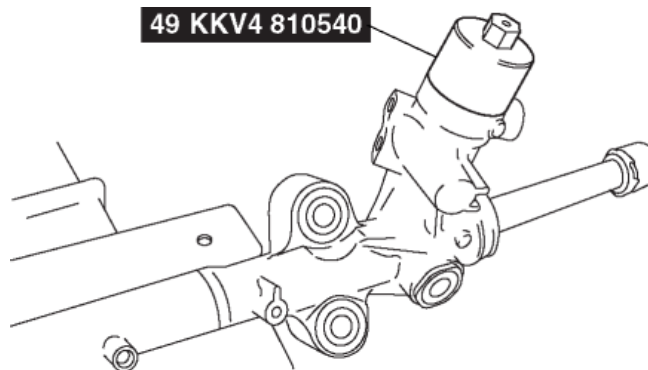
- 58.9—73.5 N·m { 6.00—7.49 kgf·m, 43.4—54.2 ft·lbf }

5. After tightening the holder, crimp the cylinder end as shown in the figure using a flathead screwdriver so that the holder does not loosen.



#### Pinion Plug Assembly Note

1. Tighten the pinion plug using the **SST**.



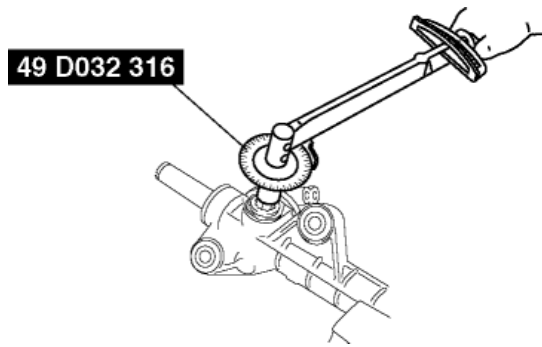
#### Tightening torque

- 39.2—44.1 N·m { 4.00—4.49 kgf·m, 29.0—32.5 ft·lbf }

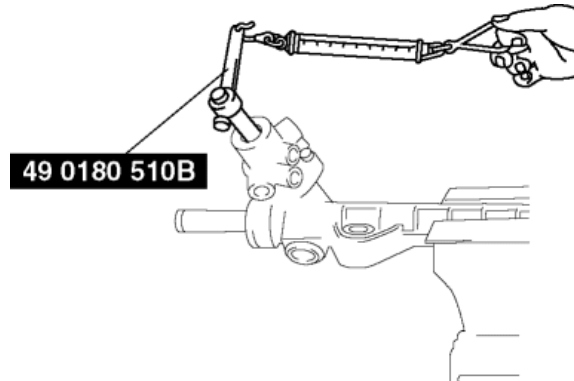
#### Adjusting Cover Assembly Note

1. Set the rack to the center position.
2. Tighten the adjusting cover to **20 N·m { 2.0 kgf·m, 15 ft·lbf }**.
3. Rotate the pinion shaft thoroughly three times to make sure that the pinion shaft and the rack engage smoothly, then loosen the adjusting cover.
4. Retighten the adjusting cover to **4.9 N·m { 0.5 kgf·m, 3.6 ft·lbf }**, then loosen it about 0 to 15° using the SST.





5. Measure the rotation torque in the range  $\pm 90^\circ$  from the pinion gear neutral point using a SST and a pull-scale.



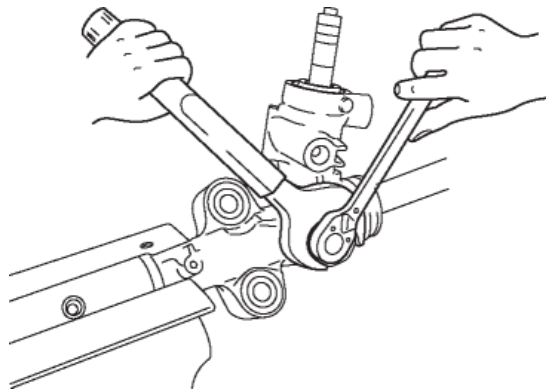
- If not within the specification, repeat **Steps 2—4**.

#### Pinion shaft rotation torque

- Center of rack  $\pm 90^\circ$ : 0.98—1.38 N·m {10.0—14.0 kgf·cm, 8.7—12.2 in·lbf}
- [Pull scale reading: 9.8—13.8 N {1.00—1.40 kgf, 2.21—3.10 lbf}]
- Except center of rack  $\pm 90^\circ$ : Less than 1.87 N·m {19.1 kgf·cm, 16.6 in·lbf}
- [Pull scale reading: Less than 19.5 N {1.99 kgf, 4.38 lbf}]

6. Apply sealant to the thread of the locknut.

7. Hold the adjusting cover so as not to rotate and tighten the locknut.

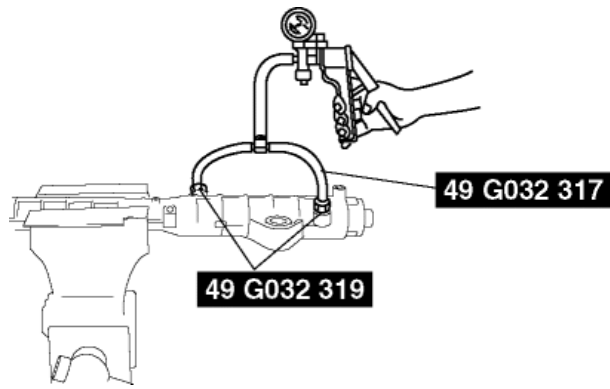


Tightening torque

- 40.0—58.0 N·m {4.08—5.91 kgf·m, 29.5—42.7 ft·lbf}

#### Hermetic sealing inspection

1. Connect the **SSTs** to the power cylinder section of the gear housing.
2. Apply **53.3 kPa {400 mmHg, 15.7 inHg}** vacuum with a vacuum pump and verify that it is held for at least **30 seconds**.



3. If the vacuum is not held, replace the oil seal.

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## 2008 - MX-5 - Steering

### STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION

#### WARNING:

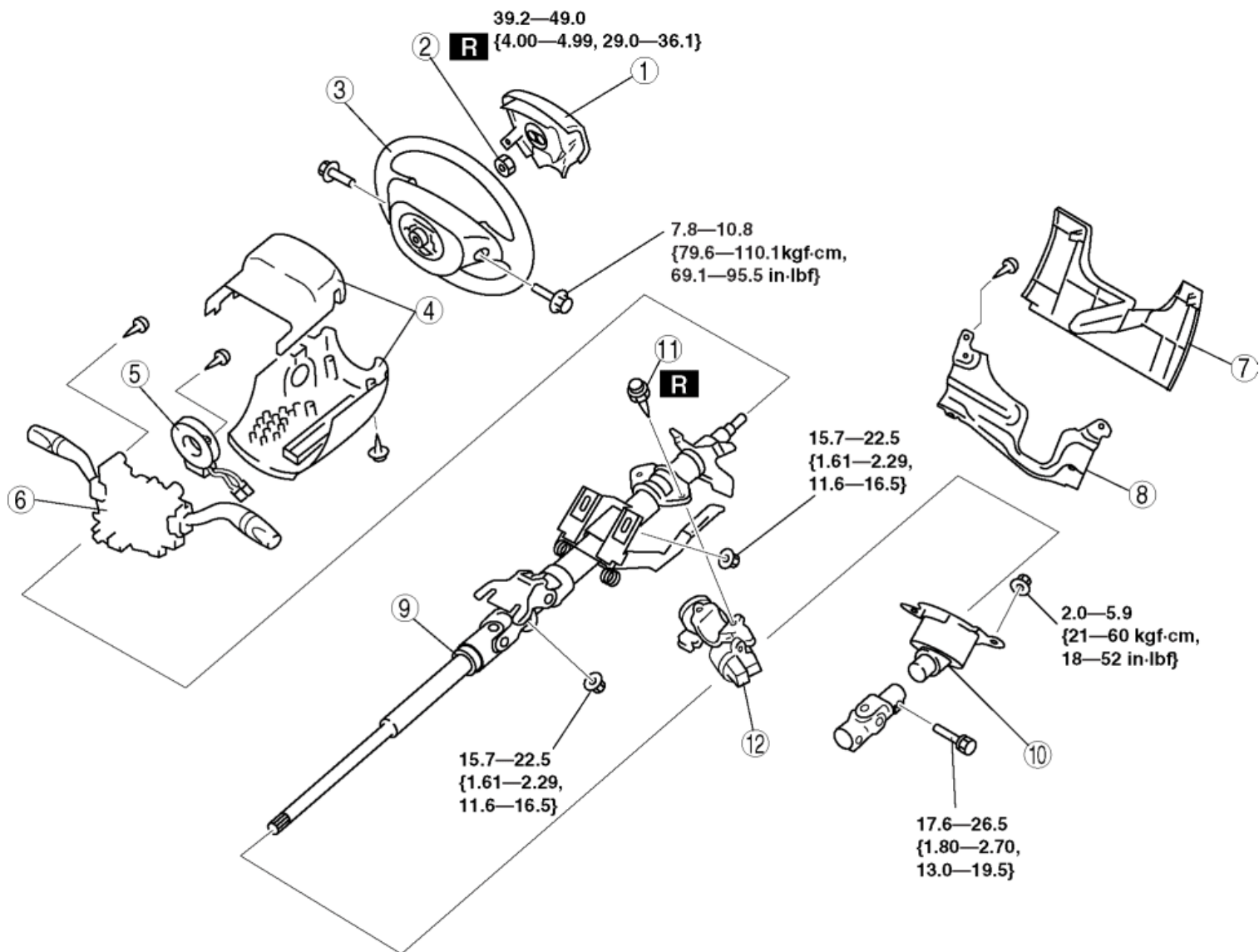
- Handling the air bag module improperly can accidentally deploy the air bag module, which may seriously injure you. Read AIR BAG SYSTEM WARNINGS before handling the air bag module. (See [AIR BAG SYSTEM SERVICE WARNINGS](#).) (See [AIR BAG SYSTEM SERVICE CAUTIONS](#).)

1. Remove in the order indicated in the table.

2. Install in the reverse order of removal.

3. If the steering lock component of a vehicle equipped with the advanced keyless system is replaced, perform the following procedure after installation.

- Without immobilizer system
  - Steering lock unit programming (See [STEERING LOCK UNIT ID CODE REGISTRATION\[ADVANCED KEYLESS SYSTEM\]](#).)
- With immobilizer system
  - Immobilizer system resetting (See [IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING\[KEYLESS ENTRY SYSTEM\]](#).)



N·m {kgf·m, ft·lbf}

1	Air bag module (See <b>DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.</b> )
2	Locknut
3	Steering wheel (See <b>Steering Wheel Removal Note.</b> ) (See <b>Steering Wheel Installation Note.</b> )
4	Column cover
5	Clock spring (See <b>CLOCK SPRING REMOVAL/INSTALLATION.</b> )
6	Combination switch

7	Lower panel
8	Knee bolster
9	Steering shaft (See <a href="#">Steering Shaft Installation Note.</a> )
10	Dust cover
11	Steering lock mounting bolts (See <a href="#">Steering Lock Mounting Bolts Removal Note.</a> ) (See <a href="#">Steering Lock Mounting Bolts Installation Note.</a> )
12	Steering lock component

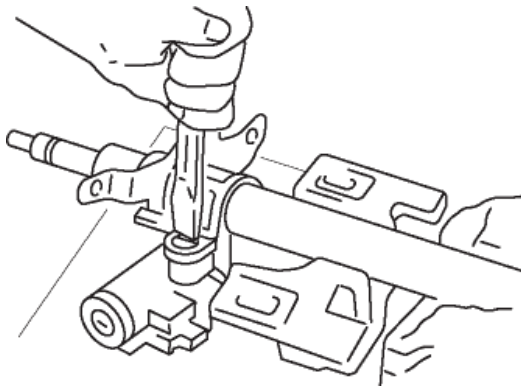
### Steering Wheel Removal Note

#### CAUTION:

- Do not try to remove the steering wheel by hitting the shaft with a hammer. The column will collapse.
1. Set the vehicle in the straight ahead position.
  2. Remove the steering wheel using a suitable puller.

### Steering Lock Mounting Bolts Removal Note

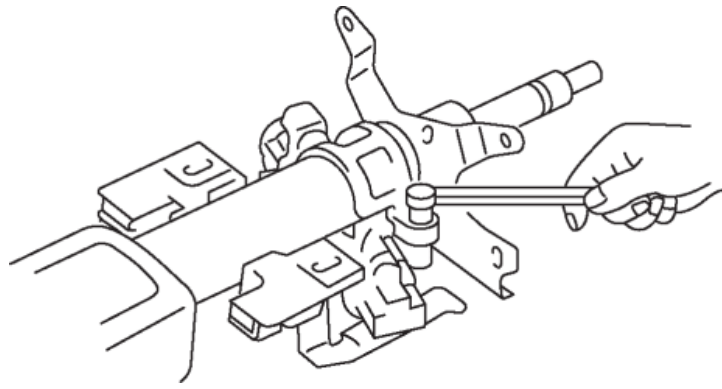
1. Make a groove in the heads of the steering lock mounting bolts using a chisel and a hammer.



2. Remove the bolts using a screwdriver.
3. Disassemble the steering lock component.

### Steering Lock Mounting Bolts Installation Note

1. Assemble the steering lock component to the steering shaft.
2. Verify that the lock operates correctly.
3. Install new steering lock mounting bolts.
4. Tighten the bolts until the heads break off.

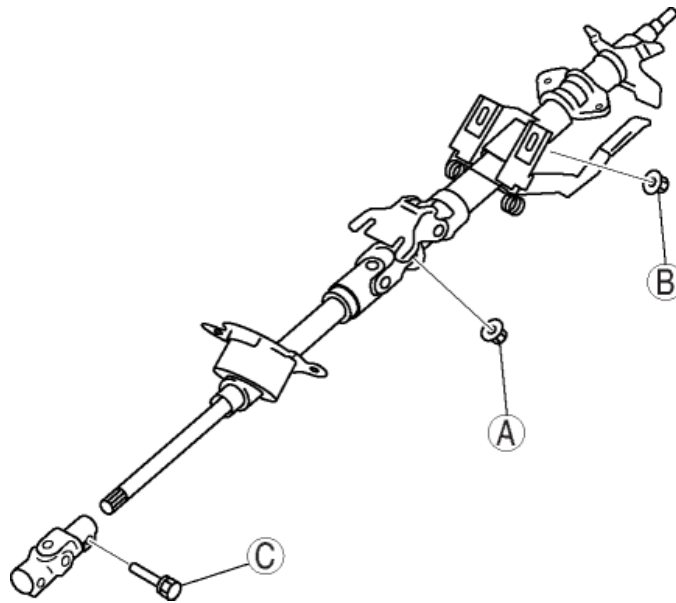


### Steering Shaft Installation Note

#### CAUTION:

- Do not apply a shock in the axial direction of the shaft.

1. Lock the tilt lever.



2. Tighten nut A.

3. Tighten nut B.

4. Tighten bolt C.

### Steering Wheel Installation Note

1. Make sure the wheels in the straight ahead position, and install the steering wheel.

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## 2008 - MX-5 - Steering

### STEERING TECHNICAL DATA

Item	Specification
Power steering fluid type	ATF M III or equivalent (e.g. Dexron® II)
Power steering fluid capacity (approximate quantity)	1.19 L { 1.25 US qt, 1.04 Imp qt }
Oil pump fluid pressure	7.55—8.05 MPa { 77.0—82.0 kgf/cm <sup>2</sup> , 1095—1167 psi }
Gear housing fluid pressure	7.55—8.05 MPa { 77.0—82.0 kgf/cm <sup>2</sup> , 1095—1167 psi }
Steering wheel play	0—30 mm { 0—1.18 in }
Steering wheel effort	7.8 N·m { 80 kgf·cm, 58 in·lbf } max.
Steering shaft length	247.3 mm { 9.736 in }
Steering rack runout	Near point A: 0.08 mm { 0.003 in } max. Near point B: 0.15 mm { 0.006 in } max.
Tie-rod end rotational torque	0.4—3.0 N·m { 3.5—30.5 kgf·cm, 3.1—26.5 in·lbf } [Pull scale reading: 3.5—29.9 N { 0.35—3.05 kgf, 0.8—6.7 lbf }]
Tie-rod swing torque	0.1—4.1 N·m { 1.1—41.8 kgf·cm, 1.0—36.2 in·lbf } [Pull scale reading: 0.6—24.4 N { 0.06—2.49 kgf, 0.2—5.4 lbf }]
Pinion shaft rotation torque	Center of rack ±90°: 0.98—1.38 N·m { 10.0—14.0 kgf·cm, 8.7—12.2 in·lbf } [Pull scale reading: 9.8—13.8 N { 1.00—1.40 kgf, 2.21—3.10 lbf }]  Except center of rack ±90°:

Less than 1.87 N·m {19.1 kgf·cm, 16.6 in·lbf}  
[Pull scale reading: Less than 19.5 N {1.99 kgf, 4.38 lbf}]

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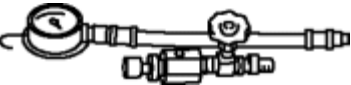
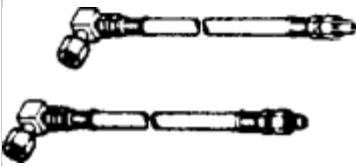

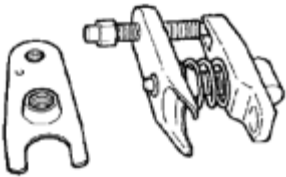



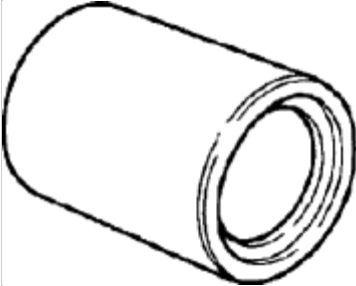
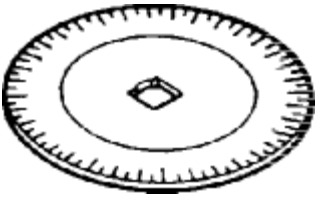
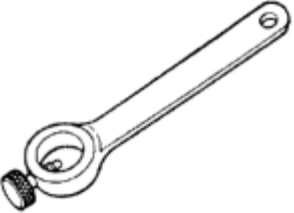
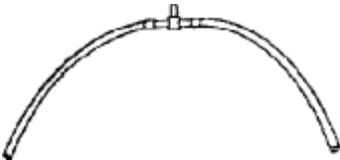
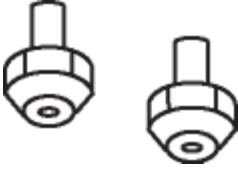
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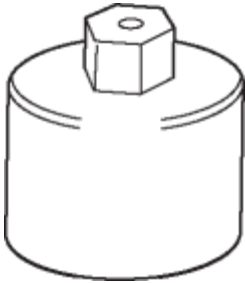
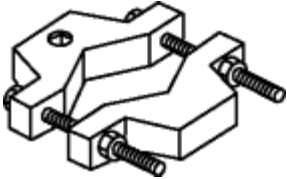
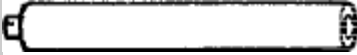
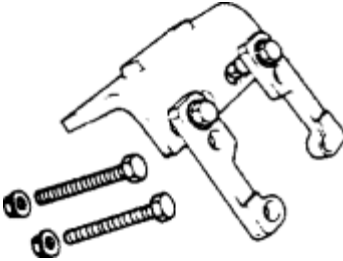
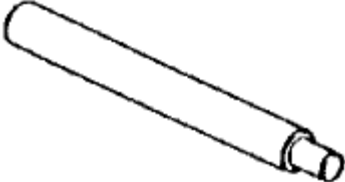


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## 2008 - MX-5 - Steering

### STEERING SST

49 1232 670B  Power steering gauge set		49 H002 671  Adapter		49 G032 3A4A  Power steering gauge adapter set	
49 T028 3A0  Ball joint puller set		49 B032 317  Bearing and oil seal remover		49 F032 303  Handle	
49 N032 303  Remover body		49 T028 301  Dust boot installer		49 D032 316  Protractor	
49 0180 510B  Preload measuring attachment		49 G032 317  Hose		49 G032 319  Adopter	
49 G033 106  Attachment		49 KKV4 810540  Wrench		49 F017 1A0  Universal Wrench	

					
49 H032 338 Joint shaft		49 F032 301 Power steering pump hanger		49 G033 102 Handle	

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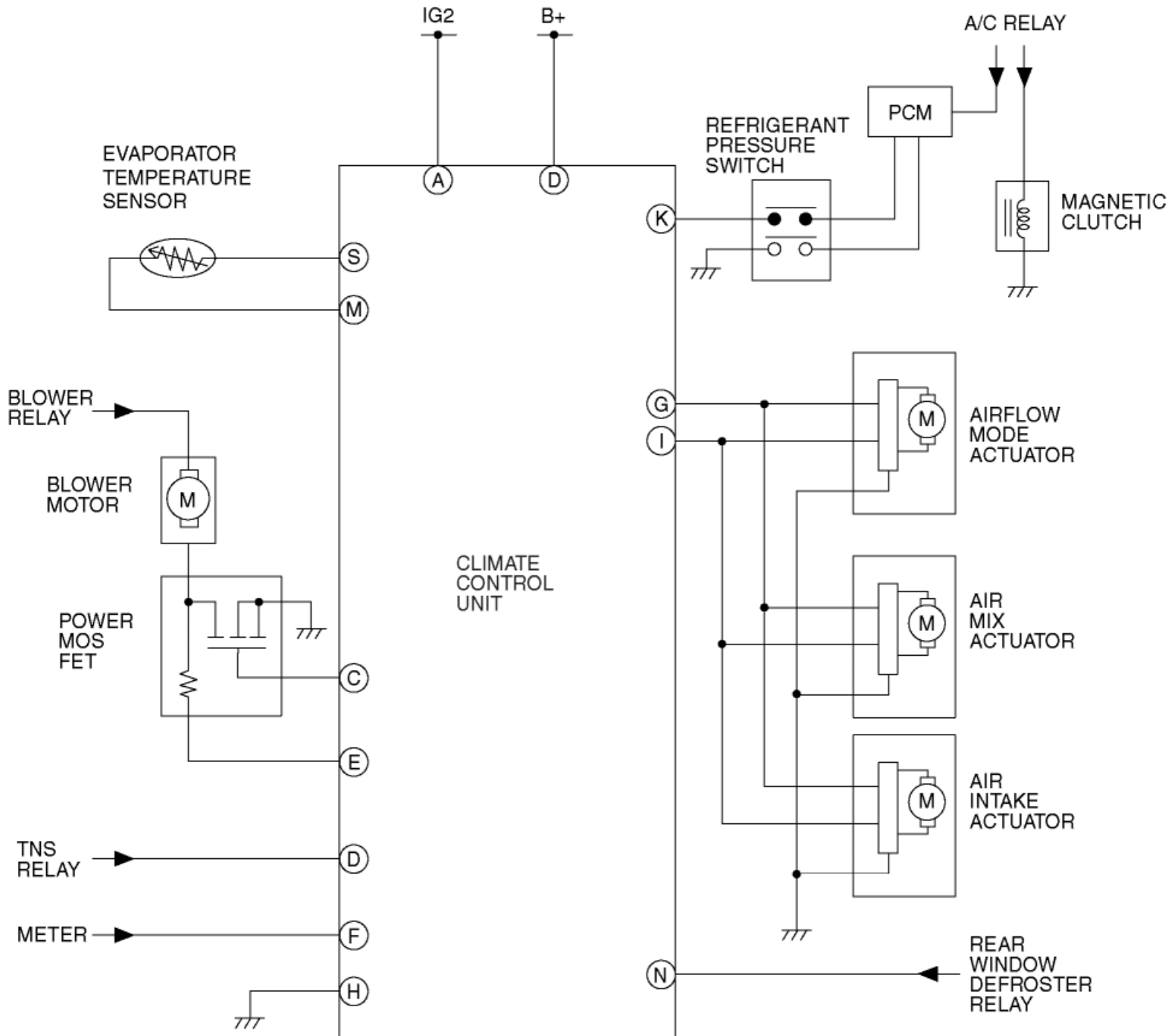
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## 2008 - MX-5 - HVAC

### HVAC SYSTEM WIRING DIAGRAM



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## 2008 - MX-5 - HVAC

### FOREWORD

- The areas for inspection (steps) are given according to various circuit malfunctions. Use the following chart to verify the symptoms of the trouble in order to diagnose the appropriate area.

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## 2008 - MX-5 - HVAC

### TROUBLESHOOTING INDEX

No.	TROUBLESHOOTING ITEM	DESCRIPTION
1	Insufficient air (or no air) blown from vents.	<ul style="list-style-type: none"><li>• Problem with each vent and/or duct.</li><li>• Airflow mode does not change.</li></ul>
2	Amount of air blown from vents does not change.	<ul style="list-style-type: none"><li>• Malfunction in blower system.</li></ul>
3	Air intake mode does not change.	<ul style="list-style-type: none"><li>• Air intake mode does not change when switching REC/FRESH mode.</li></ul>
4	No temperature control with climate control unit.	<ul style="list-style-type: none"><li>• Malfunction in A/C unit and/or climate control unit air mix system.</li></ul>
5	Windshield fogged.	<ul style="list-style-type: none"><li>• A/C compressor does not operate while airflow mode is in DEFROSTER or HEAT/DEF modes.</li><li>• Air intake mode does not change to FRESH while airflow mode is in DEFROSTER or HEAT/DEF modes.</li></ul>
6	Air from vents not cold enough.	<ul style="list-style-type: none"><li>• Magnetic clutch operates but A/C system malfunctions.</li></ul>
7	No cool air.	<ul style="list-style-type: none"><li>• Magnetic clutch does not operate.</li></ul>
8	Noise while operating A/C system.	<ul style="list-style-type: none"><li>• Noise from magnetic clutch, A/C compressor, hose or refrigerant line.</li></ul>

## 2008 - MX-5 - HVAC

### NO.1 INSUFFICIENT AIR (OR NO AIR) BLOWN FROM VENTS

<b>1</b>	<b>Insufficient air (or no air) blown from vents.</b>
<b>DESCRIPTION</b>	<ul style="list-style-type: none"> <li>• Problem with each vent and/or duct.</li> <li>• Airflow mode does not change.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Malfunction in airflow mode actuator</li> <li>• Malfunction in VENT mode system</li> <li>• Malfunction in HEAT mode system</li> <li>• Malfunction in DEFROSTER mode system</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>INSPECT AIRFLOW MODE ACTUATOR</b> <ul style="list-style-type: none"> <li>• Inspect airflow mode actuator.</li> <li>• Is it okay?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace malfunctioning part in accordance with further inspection result.
2	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN VENT MODE OR OTHER MODES</b> <ul style="list-style-type: none"> <li>• Does air blow out when in VENT mode?</li> </ul>	Yes	Go to Step 5.
		No	Go to the next step.
3	<b>INSPECT VENT</b> <ul style="list-style-type: none"> <li>• Is vent clogged?</li> </ul>	Yes	Remove obstruction, then go to Step 9.
		No	Go to the next step.
4	<b>VERIFY THAT DUCT IN DASHBOARD IS INSTALLED</b> <ul style="list-style-type: none"> <li>• Is duct in dashboard properly installed?</li> </ul>	Yes	Inspect duct for clogging, deformity and air leakage, then go to Step 9.
		No	Install duct securely in the proper position, then go to Step 9.

5	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN HEAT MODE OR DEFROSTER MODE</b> <ul style="list-style-type: none"> <li>Does air blow out when in HEAT mode?</li> </ul>	Yes	Go to the next step.
		No	Inspect vent for clogging, then go to Step 9.
6	<b>INSPECT DEFROSTER MODE</b> <ul style="list-style-type: none"> <li>Does air blow out when in DEFROSTER mode?</li> </ul>	Yes	Operation is okay. Recheck malfunction symptoms.
		No	Go to the next step.
7	<b>INSPECT VENT</b> <ul style="list-style-type: none"> <li>Is vent clogged?</li> </ul>	Yes	Remove obstruction, then go to Step 9.
		No	Go to the next step.
8	<b>VERIFY THAT DEFROSTER DUCT IS INSTALLED</b> <ul style="list-style-type: none"> <li>Is defroster duct properly installed?</li> </ul>	Yes	Inspect duct for clogging, deformity, and air leakage, then go to the next step.
		No	Install duct securely in proper position, then go to the next step.
9	<b>CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR</b> <ul style="list-style-type: none"> <li>Does air blow out?</li> </ul>	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

## 2008 - MX-5 - HVAC

### NO.2 AMOUNT OF AIR BLOWN FROM VENTS DOES NOT CHANGE

<b>2</b>	<b>Amount of air blown from vents does not change.</b>
<b>DESCRIPTION</b>	<ul style="list-style-type: none"> <li>• Malfunction in blower system.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Malfunction in A/C unit</li> <li>• Malfunction in blower motor</li> <li>• Malfunction in power MOS FET system</li> <li>• Malfunction in climate control unit</li> </ul>

- When performing an asterisked (\*) troubleshooting inspection, shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harnesses are connected correctly and undamaged.

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT HEATER 40 A FUSE</b> <ul style="list-style-type: none"> <li>• Inspect HEATER 40 A fuse.</li> <li>• Is it okay?</li> </ul>	Yes Go to the next step.
		No Replace fuse, then go to Step 15. If fuse burns out immediately, go to the next step.
2	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN A/C UNIT OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>• Turn ignition switch to ON position.</li> <li>• Turn the fan switch to ON position.</li> <li>• Recirculate air inside vehicle.</li> <li>• Does blower fan rotate smoothly?</li> </ul>	Yes Go to Step 4.
		No Go to the next step.
3	<b>INSPECT AIR DIST UNIT INTAKE VENT</b>	Yes Remove obstruction, then go to Step 15.



	<ul style="list-style-type: none"> <li>Is intake vent of air dist unit clogged?</li> </ul>	No	Inspect if there are any obstruction in passage between air dist unit to A/C unit, then go to Step 15.
4*	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN BLOWER RELAY SYSTEM OR POWER MOS FET SYSTEM</b> <ul style="list-style-type: none"> <li>Turn ignition switch to ON position.</li> <li>Turn the fan switch to OFF position.</li> <li>Test voltage at the following terminal of blower motor. <ul style="list-style-type: none"> <li>Terminal B (blower motor operation signal)</li> </ul> </li> <li>Is voltage <b>approx. 12 V</b>?</li> </ul>	Yes	Go to Step 8.
		No	Go to the next step.
5*	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN FUSE BLOCK AND BLOWER RELAY) OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>Test voltage at the following terminal of blower relay. <ul style="list-style-type: none"> <li>Terminal A (IG2 signal)</li> <li>Terminal C (B+ signal)</li> </ul> </li> <li>Is voltage <b>approx. 12 V</b>?</li> </ul>	Yes	Go to the next step.
		No	Repair wiring harness between blower relay and HEATER 40 A fuse, then go to Step 15.
6*	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN BLOWER RELAY AND GROUND) OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>Test voltage at the following terminal of blower relay. <ul style="list-style-type: none"> <li>Terminal E (GND signal)</li> </ul> </li> <li>Is voltage <b>approx. 0 V</b>?</li> </ul>	Yes	Go to the next step.
		No	Repair wiring harness between blower relay and ground, then go to Step 15.
7*	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN BLOWER RELAY AND BLOWER MOTOR) OR BLOWER RELAY</b> <ul style="list-style-type: none"> <li>Test voltage at the following terminal of blower relay.</li> </ul>	Yes	Repair wiring harness between blower relay and blower motor, then go to Step 15.
		No	Replace blower relay, then go to Step 15.

	<ul style="list-style-type: none"> <li>▪ Terminal D (blower motor operation signal)</li> </ul> <ul style="list-style-type: none"> <li>• Is voltage <b>approx. 12 V</b>?</li> </ul>		
8*	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN BLOWER MOTOR OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>• Test voltage at the following terminal of blower motor. <ul style="list-style-type: none"> <li>▪ Terminal B (blower motor operation signal)</li> </ul> </li> <li>• Is voltage <b>approx. 12 V</b>?</li> </ul>	Yes	Go to the next step.
		No	Inspect blower motor, then go to Step 15.
9*	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN BLOWER MOTOR AND POWER MOS FET) OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>• Test voltage at the following terminal of power MOS FET. <ul style="list-style-type: none"> <li>▪ Terminal A (blower motor operation signal)</li> </ul> </li> <li>• Is voltage <b>approx. 12 V</b>?</li> </ul>	Yes	Go to the next step.
		No	Repair wiring harness between blower motor and power MOS FET, then go to Step 15.
10*	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN POWER MOS FET AND GROUND) OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>• Test voltage at the following terminal of power MOS FET. <ul style="list-style-type: none"> <li>▪ Terminal D (blower motor operation signal)</li> </ul> </li> <li>• Is voltage <b>approx. 0 V</b>?</li> </ul>	Yes	Go to the next step.
		No	Repair wiring harness between power MOS FET and ground, then go to Step 15.
11	<b>INSPECT A/C UNIT</b> <ul style="list-style-type: none"> <li>• Inspect fan in A/C unit. <ul style="list-style-type: none"> <li>▪ Is fan free of interference with A/C unit case?</li> <li>▪ Is fan free of foreign material and obstruction?</li> </ul> </li> </ul>	Yes	Go to the next step.
		No	Remove obstruction, repair or replace fan and A/C unit case, then go to Step 15.

	<ul style="list-style-type: none"> <li>• Is fan okay?</li> </ul>		
12*	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN POWER MOS FET OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>• Disconnect power MOS FET connector.</li> <li>• Turn the fan switch to 1st position from off.</li> <li>• Test voltage at the following terminal of power MOS FET. <ul style="list-style-type: none"> <li>▪ Terminal B (blower motor control signal)</li> </ul> </li> <li>• Is voltage <b>approx. 10 V</b>?</li> </ul>	Yes	Replace power MOS FET, then go to Step 15. (See <b>POWER METAL OXIDE SEMICONDUCTOR FIELD EFFECT TRANSISTOR (POWER MOS FET) REMOVAL/INSTALLATION.</b> )
		No	Go to the next step.
13*	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (LACK OF CONTINUITY BETWEEN POWER MOS FET AND CLIMATE CONTROL UNIT) OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>• Turn ignition switch to LOCK position.</li> <li>• Disconnect climate control unit connector.</li> <li>• Inspect for continuity at the following terminals between power MOS FET and climate control unit. <ul style="list-style-type: none"> <li>▪ Terminal B—E (20-pin, blower motor control signal)</li> <li>▪ Terminal A—C (20-pin, blower motor feedback signal)</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes	Go to the next step.
		No	Repair wiring harness between power MOS FET and climate control unit, then go to Step 15.
14*	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN CLIMATE CONTROL UNIT OR WIRING HARNESS (SHORT TO GROUND BETWEEN POWER MOS FET AND CLIMATE CONTROL UNIT)</b> <ul style="list-style-type: none"> <li>• Inspect for continuity at the following terminal between power MOS FET and ground. <ul style="list-style-type: none"> <li>▪ Terminal B (blower motor control signal)—ground</li> </ul> </li> <li>• Is there continuity?</li> </ul>	Yes	Repair wiring harness between power MOS FET and ground, then go to the next step.
		No	Replace climate control unit, then go to the next step. (See <b>CLIMATE CONTROL UNIT REMOVAL/INSTALLATION.</b> )

15	<b>CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR</b> <ul style="list-style-type: none"><li>• Is air discharged from vent?</li></ul>	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

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## 2008 - MX-5 - HVAC

### NO.5 WINDSHIELD FOGGED

- When performing an asterisked (\*) troubleshooting inspection, shake the wiring harness and connectors while doing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harness are connected correctly and undamaged.

<b>5</b>	<b>Windshield fogged.</b>
<b>DESCRIPTION</b>	<ul style="list-style-type: none"> <li>• A/C compressor does not operate while airflow mode is in DEFROSTER or HEAT/DEF modes.</li> <li>• Air intake mode does not change to FRESH while airflow mode is in DEFROSTER or HEAT/DEF modes.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Climate control unit (B+ signal) system malfunction</li> <li>• Air intake actuator malfunction</li> <li>• Climate control unit (RECIRCULATE, FRESH signal) system malfunction</li> <li>• Malfunction in A/C unit air intake doors</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>COOL AIR BLOW OUT INSPECTION</b> <ul style="list-style-type: none"> <li>• When both A/C and fan switch in climate control unit are on, does cool air blow out from front vent?</li> </ul>	YesGo to the next step.
		NoGo to Step 1 of troubleshooting index No.8.
2	<b>INSPECT CLIMATE CONTROL UNIT POWER SUPPLY FUSE FOR B+ SIGNAL</b> <ul style="list-style-type: none"> <li>• Is climate control unit power supply fuse for B+ signal okay?</li> </ul>	YesGo to the next step.
		NoInspect for a short to ground on blown fuse circuit.  Repair or replace as necessary. Install appropriate amperage fuse.
3	<b>INSPECT AIR INTAKE ACTUATOR</b>	YesGo to the next step.

	<ul style="list-style-type: none"><li>Inspect air intake actuator.<ul style="list-style-type: none"><li>Is there grease on link?</li><li>Is link securely and properly positioned?</li><li>Is link free of obstructions?</li></ul></li><li>Are above items okay?</li></ul>	No	Apply grease or install link properly and securely, remove obstruction, then go to Step 14.
*4	<b>INSPECT WIRING HARNESS BETWEEN FUSE BLOCK AND CLIMATE CONTROL UNIT FOR CONTINUITY</b> <ul style="list-style-type: none"><li>Disconnect climate control unit connector (20-pin).</li><li>Turn ignition switch to ON position.</li><li>Test voltage at climate control unit connector terminal B (B+ signal).</li><li>Is voltage <b>approx. 12 V</b>?</li></ul>	Yes	Go to the next step.
		No	Repair wiring harness between fuse block and climate control unit, then go to Step 14.
*5	<b>INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND GROUND FOR VOLTAGE</b> <ul style="list-style-type: none"><li>Test voltage at climate control unit connector terminal H (Ground).</li><li>Is voltage <b>approx. 0V</b>?</li></ul>	Yes	Go to the next step.
		No	Repair wiring harness between climate control unit and ground, then go to Step 14.
6	<b>VERIFY WHETHER MALFUNCTION IS IN A/C UNIT AIR INTAKE DOOR OR ELSEWHERE</b> <ul style="list-style-type: none"><li>Turn ignition switch to LOCK position.</li><li>Connect climate control unit connector (20-pin).</li><li>Remove air intake actuator.</li><li>Turn ignition switch to ON position.</li><li>Set fan switch to 4th position.</li><li>Does air intake mode (RECIRCULATE, FRESH) change smoothly when air intake link is operated by hand?</li></ul>	Yes	Go to the next step.
		No	Go to Step 12.
7	<b>INSPECT AIR INTAKE ACTUATOR</b> <ul style="list-style-type: none"><li>Inspect air intake actuator.</li><li>Is it okay?</li></ul>	Yes	Go to the next step.
		No	Replace air intake actuator, go to Step 14. (See <b>AIR INTAKE ACTUATOR REMOVAL/INSTALLATION.</b> )

8	<b>INSPECT AIR INTAKE SELECTOR SWITCH AND DEFROSTER SWITCH IN CLIMATE CONTROL UNIT</b> <ul style="list-style-type: none"> <li>• Test voltage at climate control unit connector (20-pin) terminals G and I.</li> <li>• Is it okay?</li> </ul>	Yes	Go to the next step.
		No	Replace climate control unit, then go to Step 14. (See <a href="#">CLIMATE CONTROL UNIT REMOVAL/INSTALLATION.</a> )
*9	<b>INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR FOR CONTINUITY</b> <ul style="list-style-type: none"> <li>• Turn ignition switch to LOCK position.</li> <li>• Is there continuity between following climate control unit connector (20-pin) terminal and air intake actuator connector terminal? <ul style="list-style-type: none"> <li>▪ Terminal A —Terminal G (ACTR POWER)</li> <li>▪ Terminal C —Terminal I (ACTR SIGNAL)</li> </ul> </li> </ul>	Yes	Go to the next step.
		No	Repair wiring harness between climate control unit and air intake actuator, then go to Step 14.
*10	<b>INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR FOR SHORT TO GROUND</b> <ul style="list-style-type: none"> <li>• Is there continuity between following climate control unit connector (20-pin) terminal and ground? <ul style="list-style-type: none"> <li>▪ Terminal G (ACTR POWER)</li> <li>▪ Terminal I (ACTR SIGNAL)</li> </ul> </li> </ul>	Yes	Repair wiring harness between climate control unit and air intake actuator, then go to Step 14.
		No	Go to the next step.
*11	<b>INSPECT WIRING HARNESS BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR FOR SHORT TO B+</b> <ul style="list-style-type: none"> <li>• Turn ignition switch to ON position</li> <li>• Test voltage at following climate control unit connector (20-pin) terminal. <ul style="list-style-type: none"> <li>▪ Terminal G (ACTR POWER)</li> <li>▪ Terminal I (ACTR SIGNAL)</li> </ul> </li> <li>• Is voltage <b>approx. 12 V</b>?</li> </ul>	Yes	Repair wiring harness between climate control unit and air intake actuator, then go to Step 14.
		No	Replace climate control unit, then go to Step 14. (See <a href="#">CLIMATE CONTROL UNIT REMOVAL/INSTALLATION.</a> )
12	<b>INSPECT A/C UNIT AIR INTAKE DOOR</b>	Yes	Remove obstruction, then go to Step 14.

	<ul style="list-style-type: none"> <li>Is there any foreign material or obstruction in A/C unit air intake door?</li> </ul>	No	Go to the next step.
13	<b>VERIFY THAT A/C UNIT AIR INTAKE DOOR IS POSITIONED SECURELY AND PROPERLY</b> <ul style="list-style-type: none"> <li>Is A/C unit air intake door securely and properly positioned?</li> </ul>	Yes	Inspect air intake door for cracks or damage, then go to the next step.
		No	Install air intake door securely in proper position, then go to the next step.
14	<b>VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR</b> <ul style="list-style-type: none"> <li>Does malfunction disappear?</li> </ul>	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

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## 2008 - MX-5 - HVAC

### NO.3 AIR INTAKE MODE DOES NOT CHANGE

3	Air intake mode does not change.
DESCRIPTION	<ul style="list-style-type: none"> <li>Air intake mode does not change when switching REC/FRESH mode.</li> </ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"> <li>Malfunction in air intake actuator</li> <li>Malfunction in air intake door</li> </ul>

- When performing an asterisked (\*) troubleshooting inspection, shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harnesses are connected correctly and undamaged.

#### Diagnostic procedure

STEP	INSPECTION	ACTION
1*	<b>INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN AIR INTAKE ACTUATOR, WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR) OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>Turn ignition switch to ON position.</li> <li>Test voltages at the following terminals of climate control unit. <ul style="list-style-type: none"> <li>Terminal G (20-pin, ACTR POWER)</li> <li>Terminal I (20-pin, ACTR SIGNAL)</li> <li>Terminal H (20-pin, GND)</li> </ul> </li> </ul> <p>(See <a href="#">CLIMATE CONTROL UNIT INSPECTION</a>.)</p> <ul style="list-style-type: none"> <li>Are voltages okay?</li> </ul>	Yes Go to the next step.  No Go to Step 3.
2*	<b>INSPECT TO SEE WHETHER MALFUNCTION (LACK OF</b>	Yes Replace air intake actuator, then

	<p><b>CONTINUITY) IS IN AIR INTAKE ACTUATOR OR WIRING HARNESS (BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR)</b></p> <ul style="list-style-type: none"> <li>Test voltages at the following terminals of air intake actuator. <ul style="list-style-type: none"> <li>Terminal A</li> <li>Terminal I</li> </ul> </li> <li>Are voltages as shown below? <ul style="list-style-type: none"> <li>Terminal A: <b>approx. 0.5 V</b> during RECIRCULATE and <b>approx. 10 V</b> during FRESH</li> <li>Terminal I: <b>approx. 10 V</b> during RECIRCULATE and <b>approx. 0.5 V</b> during FRESH</li> </ul> </li> </ul>	<p>go to Step 8. (See <a href="#">AIR INTAKE ACTUATOR REMOVAL/INSTALLATION.</a>)</p>
		<p>No Repair wiring harness between climate control unit and air intake actuator, then go to Step 8.</p>
3	<p><b>INSPECT TO SEE WHETHER MALFUNCTION IS IN AIR INTAKE ACTUATOR OR ELSEWHERE</b></p> <ul style="list-style-type: none"> <li>Disconnect air intake actuator connector.</li> <li>Test voltages at the following terminals of climate control unit. <ul style="list-style-type: none"> <li>Terminal G (20-pin, ACTR POWER)</li> <li>Terminal I (20-pin, ACTR SIGNAL)</li> </ul> <p>(See <a href="#">CLIMATE CONTROL UNIT INSPECTION.</a>)</p> </li> <li>Are voltages okay?</li> </ul>	<p>Yes Inspect air intake actuator, then go to Step 8.</p>
		<p>No Go to the next step.</p>
4	<p><b>INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (SHORT TO B+ BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR) OR ELSEWHERE</b></p> <ul style="list-style-type: none"> <li>Disconnect climate control unit connector.</li> <li>Test voltages at the following terminals of climate control unit. <ul style="list-style-type: none"> <li>Terminal G (20-pin, ACTR POWER)</li> <li>Terminal I (20-pin, ACTR SIGNAL)</li> </ul> </li> <li>Are voltages <b>approx. 0 V</b>?</li> </ul>	<p>Yes Go to the next step.</p>
		<p>No Repair wiring harness between climate control unit and air intake actuator, then go to Step 8.</p>
5	<p><b>INSPECT TO SEE WHETHER MALFUNCTION IS IN</b></p>	<p>Yes Repair wiring harness between</p>

	<b>WIRING HARNESS (SHORT TO GROUND BETWEEN CLIMATE CONTROL UNIT AND AIR INTAKE ACTUATOR) OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>• Turn ignition switch to LOCK position.</li> <li>• Inspect for continuity at the following terminals between climate control unit and ground. <ul style="list-style-type: none"> <li>▪ Terminal G (20-pin, ACTR POWER)</li> <li>▪ Terminal I (20-pin, ACTR SIGNAL)</li> </ul> </li> <li>• Is there continuity?</li> </ul>		climate control unit and air intake actuator, then go to Step 8.
		No	Go to the next step.
6	<b>INSPECT AIR INTAKE LINK</b> <ul style="list-style-type: none"> <li>• Inspect air intake links. <ul style="list-style-type: none"> <li>▪ Is there grease on link?</li> <li>▪ Are links securely and properly installed?</li> <li>▪ Are links free of obstructions and hindrances?</li> </ul> </li> <li>• Are above items okay?</li> </ul>	Yes	Go to the next step.
		No	Apply grease to links. If any links are damaged, replace air intake actuator, then go to Step 8.
7	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN CLIMATE CONTROL UNIT OR AIR INTAKE DOOR</b> <ul style="list-style-type: none"> <li>• Inspect blower unit air intake door. <ul style="list-style-type: none"> <li>▪ Is door free of obstructions, cracks, and damage?</li> <li>▪ Are doors securely and properly installed?</li> </ul> </li> <li>• Are above items okay?</li> </ul>	Yes	Replace climate control unit, then go to the next step. (See <a href="#">CLIMATE CONTROL UNIT REMOVAL/INSTALLATION.</a> )
		No	Remove obstruction, or install doors in proper position. If any doors are cracked or damaged, replace them, then go to the next step.
8	<b>CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR</b> <ul style="list-style-type: none"> <li>• Does air intake mode change smoothly?</li> </ul>	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

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### NO.4 AIR INTAKE MODE DOES NOT CHANGE

<b>4</b>	<b>No temperature control with climate control unit.</b>
<b>DESCRIPTION</b>	<ul style="list-style-type: none"> <li>Malfunction in A/C unit and/or climate control unit air intake system.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>A/C unit air intake link, air intake crank, air intake rod malfunction</li> <li>Climate control unit rack-and-pinion, air intake wire malfunction</li> <li>A/C unit air intake door malfunction</li> <li>Heater piping malfunction</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT COOLANT TEMPERATURE</b> <ul style="list-style-type: none"> <li>Is coolant sufficiently warmed up?</li> </ul>	Yes Go to the next step.
		No Warm engine up, then go to Step 8.
2	<b>INSPECT A/C UNIT AIR INTAKE SYSTEM</b> <ul style="list-style-type: none"> <li>Inspect A/C unit air intake links, air intake cranks, air intake rods, air intake actuator. <ul style="list-style-type: none"> <li>Is there grease on links and cranks?</li> <li>Are links, cranks, and rods securely installed in their proper positions?</li> </ul> </li> <li>Are above items okay?</li> </ul>	Yes Go to the next step.
		No Apply grease or install links, cranks, and rods securely in their proper positions, repair or replace air intake actuator, then go to Step 8.

3	<b>VERIFY THAT AIR INTAKE WIRE FROM A/C UNIT IS POSITIONED SECURELY AND CORRECTLY (IF AVAILABLE)</b> <ul style="list-style-type: none"> <li>Is air intake wire securely installed in the correct position in relation to A/C unit air intake links?</li> </ul>	Yes	Go to the next step.
		No	Adjust air intake wire or install securely in correct position, then go to Step 8.
4	<b>INSPECT CLIMATE CONTROL UNIT</b> <ul style="list-style-type: none"> <li>Inspect climate control unit. (See <b>CLIMATE CONTROL UNIT INSPECTION.</b>)</li> <li>Is climate control unit okay?</li> </ul>	Yes	Go to the next step.
		No	Repair or replace climate control unit, then go to Step 8. (See <b>CLIMATE CONTROL UNIT REMOVAL/INSTALLATION.</b> )
5	<b>INSPECT A/C UNIT</b> <ul style="list-style-type: none"> <li>Is there any foreign material or obstruction in A/C unit air intake doors?</li> </ul>	Yes	Remove obstruction, then go to Step 8.
		No	Go to the next step.
6	<b>INSPECT A/C UNIT AIR INTAKE DOORS</b> <ul style="list-style-type: none"> <li>Is A/C unit air intake door securely and properly installed?</li> </ul>	Yes	Inspect air intake door for cracks or damage, then go to the next step.
		No	Install air intake door securely in proper position, then go to the next step.
7	<b>INSPECT HEATER LINES</b> <ul style="list-style-type: none"> <li>Inspect heater lines. <ul style="list-style-type: none"> <li>Is heater piping free of damage and cracks?</li> <li>Are heater piping connections free of engine coolant leakage?</li> <li>Are heater piping connections securely tightened?</li> <li>Are heater piping installation points on A/C unit free of</li> </ul> </li> </ul>	Yes	Operation is okay. Recheck malfunction symptoms.
		No	If heater piping connections is loosed, tighten connections with specified torque.  Repair or replace heater piping, then go to the next step.

	engine coolant leakage?  • Are above items okay?		
8	<b>VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR</b>  • Does unit operate in every temperature setting?	Yes	Troubleshooting completed.  Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

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### NO.6 AIR FROM VENTS NOT COLD ENOUGH

<b>6</b>	<b>Air from vents not cold enough.</b>
<b>DESCRIPTION</b>	<ul style="list-style-type: none"> <li>• Magnetic clutch operates but A/C system malfunctions.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Drive belt malfunction</li> <li>• Malfunction in A/C unit or condenser</li> <li>• Malfunction in receiver/drier or expansion valve (valve closes too much)</li> <li>• Malfunction in refrigerant lines</li> <li>• A/C compressor system malfunction, insufficient compressor oil</li> <li>• Over filling of compressor oil, malfunction in expansion valve or A/C unit air intake link system</li> </ul>

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT DRIVE BELT</b> <ul style="list-style-type: none"> <li>• Inspect drive belt.</li> </ul> (See <b>DRIVE BELT INSPECTION [LF]</b> .) <ul style="list-style-type: none"> <li>• Is it okay?</li> </ul>	Yes Go to the next step.
		No Adjust or replace drive belt, then go to Step 20.
2	<b>INSPECT REFRIGERANT SYSTEM PERFORMANCE</b> <ul style="list-style-type: none"> <li>• Perform refrigerant system performance test.</li> </ul> (See <b>REFRIGERANT SYSTEM PERFORMANCE TEST</b> .) <ul style="list-style-type: none"> <li>• Is operation normal?</li> </ul>	Yes Operation is normal. (Recheck malfunction symptoms.)
		No Go to the next step.
3	<b>CHECK TO SEE WHETHER MALFUNCTION</b>	Yes Go to the next step.

	<b>IS IN A/C UNIT INTAKE AND CONDENSER OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>Are refrigerant high-pressure and low-pressure values both high?</li> </ul>	No	Go to Step 6.
4	<b>INSPECT A/C UNIT INTAKE</b> <ul style="list-style-type: none"> <li>Is A/C unit intake clogged?</li> </ul>	Yes	Remove obstruction, then go to Step 20. (If air does not reach evaporator within A/C unit, heat exchange does not occur and refrigerant pressure becomes high.  Therefore, removal of obstruction is necessary.)
		No	Go to the next step.
5	<b>INSPECT CONDENSER</b> <ul style="list-style-type: none"> <li>Inspect condenser.  (See <b>CONDENSER INSPECTION</b>.)</li> <li>Is it okay?</li> </ul>	Yes	Adjust refrigerant to specified amount, then go to Step 20. (Excessive amount of refrigerant.)
		No	Replace condenser, or repair and clean condenser fins, then go to Step 20. (See <b>CONDENSER REMOVAL/INSTALLATION</b> .)
6	<b>CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE, RECEIVER/DRIER AND REFRIGERANT LINES OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>Are refrigerant high-pressure and low-pressure values low?</li> </ul>	Yes	Go to the next step.
		No	Go to Step 14.
7	<b>CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE AND RECEIVER/DRIER OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>Immediately after A/C compressor operates, does refrigerant high-pressure value momentarily rise to correct value, then fall and stay below it? (Is there negative pressure on low-pressure side?)</li> </ul>	Yes	Go to the next step.
		No	Go to Step 10.
8	<b>CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE OR RECEIVER/DRIER</b> <ul style="list-style-type: none"> <li>Turn A/C switch off and let air conditioner stop for <b>10 min</b>.</li> <li>Start engine.</li> <li>Turn both A/C switch and fan</li> </ul>	Yes	Go to the next step.
		No	Replace condenser and apply vacuum to refrigerant line for <b>more than 30 min</b> using vacuum pump, add refrigerant to specified level, then go to Step 20. (Since water has intermixed in receiver/drier and it is saturated, replacement is necessary.) (See <b>CONDENSER REMOVAL/INSTALLATION</b> .)



	<p>switch on.</p> <ul style="list-style-type: none"><li>Does malfunction occur after A/C compressor turns on?</li></ul>		
9	<p><b>VERIFY THAT EXPANSION VALVE HEAT-SENSING TUBE WITHIN A/C UNIT IS POSITIONED SECURELY AND CORRECTLY</b></p> <ul style="list-style-type: none"><li>Is expansion valve heat-sensing tube within A/C unit securely installed in proper position?</li></ul>	Yes	Replace expansion valve, then go to Step 20. (Since valve closes too much, replacement is necessary.) (See <a href="#">A/C UNIT DISASSEMBLY/ASSEMBLY</a> .)
		No	Install heat-sensing tube securely in proper position, then go to Step 20.
10	<p><b>INSPECT REFRIGERANT LINES</b></p> <ul style="list-style-type: none"><li>Inspect refrigerant lines.<ul style="list-style-type: none"><li>Is piping free of damage and cracks?</li><li>Are piping connections free of oil grime? (Visual inspection)</li><li>Are piping connections free of gas leakage?</li><li>Are piping installation points on condenser free of gas leakage?</li><li>Are piping installation points on receiver/drier free of gas leakage?</li><li>Are piping installation points on A/C compressor free of gas leakage?</li><li>Are piping installation</li></ul></li></ul>	Yes	Go to the next step.
		No	If piping or A/C component(s) are damaged or cracked, replace them.  Then go to Step 20.  If there is no damage, go to Step 13.

	<p>points on A/C unit free of gas leakage?</p> <ul style="list-style-type: none"> <li>Perform gas leak inspection using gas leak tester.</li> </ul> <p>• Are above items okay?</p>		
11	<p><b>INSPECT EVAPORATOR PIPING CONNECTIONS IN A/C UNIT FOR GAS LEAKAGE</b></p> <ul style="list-style-type: none"> <li>Are piping connections for evaporator in A/C unit free of gas leakage?</li> </ul>	<p>Yes If the vane makes a noise, add <b>10 ml {10 cc, 0.34 fl oz}</b> of compressor oil to the A/C compressor. Verify that the noise is no longer heard.</p> <p>Adjust refrigerant to specified amount, then go to Step 20.</p>	
		<p>No If piping is damaged or cracked, replace it.</p> <p>Then go to Step 20.</p> <p>If there is no damage, go to the next step.</p>	
12	<p><b>INSPECT EVAPORATOR PIPING CONNECTIONS IN A/C UNIT FOR LOOSE</b></p> <ul style="list-style-type: none"> <li>Are piping connections for evaporator in A/C unit loose?</li> </ul>	<p>Yes Tighten connections with specified torque, adjust both compressor oil and refrigerant to specified amount, then go to Step 20.</p>	
		<p>No If the vane makes a noise, add <b>10 ml {10 cc, 0.34 fl oz}</b> of compressor oil to the A/C compressor. Verify that the noise is no longer heard.</p> <p>Replace O-ring on piping, adjust refrigerant to specified amount, then go to Step 20.</p>	
13	<p><b>INSPECT PIPING CONNECTIONS FOR LOOSE</b></p> <ul style="list-style-type: none"> <li>Are piping connections loose?</li> </ul>	<p>Yes Tighten connections with specified torque, adjust both compressor oil and refrigerant to specified amount, then go to Step 20.</p>	
		<p>No If the vane makes a noise, add <b>10 ml {10 cc, 0.34 fl oz}</b> of compressor oil to the A/C compressor. Verify that the noise is no longer heard.</p> <p>Replace O-ring on piping, adjust refrigerant to specified amount, then go to Step 20.</p>	
14	<p><b>CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE, AIR MIX ACTUATOR AND COMPRESSOR OIL OR</b></p>	<p>Yes Go to the next step. (Pressure hardly increases.)</p>	
		<p>No Go to Step 17.</p>	

	<p><b>ELSEWHERE</b></p> <ul style="list-style-type: none"> <li>Does refrigerant high-pressure value hardly increase?</li> </ul>		
15	<p><b>CHECK TO SEE WHETHER MALFUNCTION IS IN COMPRESSOR OIL AMOUNT AND A/C COMPRESSOR OR ELSEWHERE</b></p> <ul style="list-style-type: none"> <li>When engine is racing, does high-pressure value increase?</li> </ul>	<p>Yes Return to Step 3.</p> <p>No Go to the next step.</p>	
16	<p><b>CHECK TO SEE WHETHER MALFUNCTION IS IN COMPRESSOR OIL AMOUNT OR A/C COMPRESSOR</b></p> <ul style="list-style-type: none"> <li>After compressor oil is replenished each <b>10 ml {10 cc, 0.34 fl oz}</b>, does high-pressure value increase?</li> </ul>	<p>Yes Troubleshooting completed. (Explain to customer that cause was insufficient compressor oil.)</p> <p>No Replace A/C compressor, then go to Step 20. (Cause is defective A/C compressor.) (See <a href="#">A/C COMPRESSOR REMOVAL/INSTALLATION</a>.)</p>	
17	<p><b>CHECK TO SEE WHETHER MALFUNCTION IS IN EXPANSION VALVE OR ELSEWHERE</b></p> <ul style="list-style-type: none"> <li>Is only refrigerant low-pressure value high?</li> </ul>	<p>Yes Go to Step 19.</p> <p>No Go to the next step.</p>	
18	<p><b>VERIFY THAT AIR MIX IS INSTALLED SECURELY AND PROPERLY</b></p> <ul style="list-style-type: none"> <li>Are A/C unit air mix links, air mix cranks, and air mix rods securely and properly installed?</li> </ul>	<p>Yes Set fan switch to 4th position.</p> <p>Turn A/C switch on.</p> <p>Set FRESH mode.</p> <p>Set temperature control to MAX COLD.</p> <p>Set VENT mode.</p> <ul style="list-style-type: none"> <li>(1) Start and run the engine at <b>1,500 rpm</b> for <b>10 min</b>.</li> <li>(2) Run the engine at idle for <b>1 min</b>.</li> <li>(3) Within <b>12 s</b>, idle → <b>4,000 rpm</b> → idle. Perform cycle <b>5 times</b>.</li> <li>(4) Run the engine at idle for <b>30 s</b>.</li> <li>(5) Drain the compressor oil completely from the A/C compressor and verify the amount. <ul style="list-style-type: none"> <li>If there is <b>approx. 90 ml {90 cc, 3.0 fl oz}</b> of</li> </ul> </li> </ul>	

			<p>compressor oil, go to Step 20.</p> <ul style="list-style-type: none"><li>• If there is <b>more than 90 ml {90 cc, 3.0 fl oz}</b> of compressor oil, remove surplus oil and fill A/C compressor with <b>90 ml {90 cc, 3.0 fl oz}</b> of compressor oil. Repeat Steps (1) to (5).</li></ul> <p>(Cause is excessive amount of compressor oil.)</p>
		No	Repair or install links, cranks and rods securely in proper position, then go to Step 20.
19	<b>VERIFY THAT EXPANSION VALVE HEAT-SENSING TUBE WITHIN A/C UNIT IS POSITIONED SECURELY AND CORRECTLY</b> <ul style="list-style-type: none"><li>• Is expansion valve heat-sensing tube within A/C unit securely installed in proper position?</li></ul>	Yes	Replace expansion valve, then go to the next step. (Since valve opens too much, replacement is necessary.)
		No	Install heat-sensing tube securely in proper position, then go to the next step.
20	<b>VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR</b> <ul style="list-style-type: none"><li>• Does cool air blow out? (Are results of refrigerant system performance test okay?)</li></ul>	Yes	Troubleshooting completed.  Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

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### NO.7 AIR FROM VENTS NOT COLD ENOUGH

<b>7</b>	No cool air
<b>DESCRIPTION</b>	<ul style="list-style-type: none"> <li>• Magnetic clutch does not operate.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Malfunction in PCM A/C cut control system</li> <li>• Malfunction in climate control unit</li> <li>• Malfunction in refrigerant pressure switch</li> <li>• Malfunction in PCM (A/C signal)</li> <li>• Malfunction in PCM (IG1 signal)</li> <li>• Malfunction in A/C compressor</li> <li>• Malfunction in A/C relay</li> <li>• Malfunction in evaporator temperature sensor</li> </ul>

- When performing an asterisked (\*) troubleshooting inspection, shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunctions. If there is a problem, check to make sure connectors, terminals and wiring harnesses are connected correctly and undamaged.

### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT AIR BLOW OUT</b> <ul style="list-style-type: none"> <li>• Does air blow out?</li> </ul>	Yes Go to the next step.
		No Go to Step 1 of troubleshooting indexes No.1 and 2.
2	<b>INSPECT A/C COMPRESSOR OPERATION</b> <ul style="list-style-type: none"> <li>• Start engine.</li> <li>• Turn A/C switch and fan switch on.</li> <li>• Does A/C compressor</li> </ul>	Yes Go to Step 1 of troubleshooting index No.7.
		No Go to the next step.

	operate?		
3	<b>INSPECT FOR DTC IN PCM</b> <ul style="list-style-type: none"> <li>Inspect for DTCs related to the PCM on-board diagnostic system.</li> <li>Are any DTCs displayed?</li> </ul>	Yes	Go to appropriate inspection procedure.
		No	Go to the next step.
4	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN CLIMATE CONTROL UNIT OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>Does cool air blow out when terminal K of climate control unit connector (20-pin, A/C signal) is grounded?</li> </ul>	Yes	Replace climate control unit, then go to Step 17. (See <a href="#">CLIMATE CONTROL UNIT REMOVAL/INSTALLATION.</a> )
		No	Release short, then go to the next step.
5*	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN A/C SIGNAL CIRCUIT (BETWEEN REFRIGERANT PRESSURE SWITCH AND PCM) OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>Test voltage at following terminal of refrigerant pressure switch. <ul style="list-style-type: none"> <li>Terminal D (A/C signal)</li> </ul> </li> <li>Is voltage <b>approx. 12 V</b>?</li> </ul>	Yes	Go to Step 7.
		No	Go to the next step.
6*	<b>INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN WIRING HARNESS (BETWEEN REFRIGERANT PRESSURE SWITCH AND PCM) OR PCM</b> <ul style="list-style-type: none"> <li>Test voltage at A/C signal terminal AU of PCM.</li> <li>Is voltage <b>approx. 12 V</b>?</li> </ul>	Yes	Repair wiring harness between PCM and refrigerant pressure switch, then go to Step 17.
		No	Inspect PCM, then go to Step 17.
7	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN REFRIGERANT PRESSURE SWITCH, REFRIGERANT AMOUNT, OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>Does cool air blow out when terminals C and D of refrigerant pressure switch connector are shorted?</li> </ul>	Yes	Go to Step 9.
		No	Go to the next step.

8*	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN WIRING HARNESS (BETWEEN REFRIGERANT PRESSURE SWITCH AND CLIMATE CONTROL UNIT) OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>Test voltage at following terminal of climate control unit. <ul style="list-style-type: none"> <li>Terminal K (20-pin, A/C signal)</li> </ul> </li> <li>Is voltage <b>approx. 12 V</b>?</li> </ul>	Yes	Go to Step 10.
		No	Repair wiring harness between refrigerant pressure switch and climate control unit, then go to Step 17.
9	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN REFRIGERANT PRESSURE SWITCH OR REFRIGERANT AMOUNT</b> <ul style="list-style-type: none"> <li>Inspect refrigerant pressure switch.</li> <li>Is it okay?</li> </ul>	Yes	If refrigerant amount is empty, replace condenser, apply vacuum to refrigerant line for <b>more than 30 min</b> using vacuum pump, and add refrigerant to specified level, then go to Step 17. (See <a href="#">CONDENSER REMOVAL/INSTALLATION.</a> )
		No	Replace refrigerant pressure switch, then go to Step 17. (See <a href="#">REFRIGERANT PRESSURE SWITCH REMOVAL/INSTALLATION.</a> )
10	<b>INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN A/C CONTROL SIGNAL CIRCUIT (BETWEEN A/C RELAY AND PCM) OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>Does cool air blow out when terminal E of A/C relay connector (A/C control signal) is grounded?</li> </ul>	Yes	Release short, then go to the next step.
		No	Go to Step 12.
11*	<b>INSPECT TO SEE WHETHER MALFUNCTION (LACK OF CONTINUITY) IS IN PCM OR WIRING HARNESS (BETWEEN A/C RELAY AND PCM)</b> <ul style="list-style-type: none"> <li>Test voltage at the A/C relay control signal terminal I of PCM.</li> <li>Is voltage <b>approx. 12 V</b>?</li> </ul>	Yes	Inspect PCM, then go to Step 17.
		No	Repair wiring harness between A/C relay and PCM, then go to Step 17.
12*	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN MAGNETIC CLUTCH OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>Test voltage at the following terminal of magnetic clutch thermal protector.</li> </ul>	Yes	Inspect magnetic clutch, then go to Step 17.
		No	Go to the next step.

	<ul style="list-style-type: none"> <li>▪ Terminal A (magnetic clutch operation signal)</li> <li>• Is voltage <b>approx. 12 V</b>?</li> </ul>		
13	<b>INSPECT FUSE</b> <ul style="list-style-type: none"> <li>• Are A/C relay power supply fuses okay?</li> </ul>	Yes	Go to the next step.
		No	Replace fuse, then go to Step 17. If fuse burns out immediately, go to the next step.
14	<b>INSPECT WIRING HARNESS BETWEEN FUSE BLOCK AND A/C RELAY FOR LACK OF CONTINUITY</b> <ul style="list-style-type: none"> <li>• Test voltages at following terminals of A/C relay. <ul style="list-style-type: none"> <li>▪ Terminal C (A/C relay control signal)</li> <li>▪ Terminal A (A/C control signal)</li> </ul> </li> <li>• Are voltages <b>approx. 12 V</b>?</li> </ul>	Yes	Go to the next step.
		No	Repair wiring harness between fuse block and A/C relay, then go to Step 17.
15	<b>INSPECT TO SEE WHETHER MALFUNCTION IS IN A/C RELAY OR WIRING HARNESS (BETWEEN A/C RELAY AND MAGNETIC CLUTCH) AND EVAPORATOR TEMPERATURE SENSOR</b> <ul style="list-style-type: none"> <li>• Test voltage at the following terminal of A/C relay. <ul style="list-style-type: none"> <li>▪ Terminal D (magnetic clutch operation signal)</li> </ul> </li> <li>• Is voltage <b>approx. 12 V</b>?</li> </ul>	Yes	Inspect wiring harness between A/C relay and magnetic clutch. <ul style="list-style-type: none"> <li>• If above wiring harness is OK, go to the next step.</li> <li>• If above wiring harness malfunctions, repair wiring harness, then go to Step 17.</li> </ul>
		No	Replace A/C relay, then go to Step 17.
16	<b>INSPECT EVAPORATOR TEMPERATURE SENSOR</b> <ul style="list-style-type: none"> <li>• Inspect evaporator temperature sensor.</li> <li>• Is it okay?</li> </ul>	Yes	Go to the next step.
		No	Replace evaporator temperature sensor, then go to the next step.



17	<b>CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR</b> <ul style="list-style-type: none"><li>Does cool air blow out? (Are the results of refrigerant system performance test okay?)</li></ul>	Yes	Troubleshooting completed. Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

## 2008 - MX-5 - HVAC

### NO.8 NOISE WHILE OPERATING A/C SYSTEM

<b>8</b>	<b>Noise while operating A/C system.</b>
<b>DESCRIPTION</b>	<ul style="list-style-type: none"> <li>Noise from magnetic clutch, A/C compressor, hose or refrigerant line.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>Magnetic clutch operation noise</li> <li>A/C compressor vane noise</li> <li>A/C compressor slippage noise</li> <li>Hose or refrigerant line interference noise</li> </ul>

#### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>CHECK A/C COMPRESSOR VANE NOISE</b> <ul style="list-style-type: none"> <li>Is there a jingling, popping, beeping, or buzzing sound (A/C compressor vane noise)?</li> </ul>	Yes Go to Step 5.
		No Go to the next step.
2	<b>INSPECT A/C COMPRESSOR SLIPPAGE NOISE</b> <ul style="list-style-type: none"> <li>Is there a squeaking or whirling sound (A/C compressor slippage noise)?</li> </ul>	Yes Go to Step 14.
		No Go to the next step.
3	<b>INSPECT A/C COMPRESSOR INTERFERENCE NOISE</b> <ul style="list-style-type: none"> <li>Is there a rattling or vibrating sound (interference noise)?</li> </ul>	Yes Go to Step 18.
		No Go to the next step.
4	<b>INSPECT MAGNETIC CLUTCH OPERATION NOISE</b> <ul style="list-style-type: none"> <li>Is there a clicking sound (magnetic clutch operation</li> </ul>	Yes Adjust clearance between pressure plate of magnetic clutch and A/C compressor pulley, then go to Step 19.  (See <b>MAGNETIC CLUTCH ADJUSTMENT</b> .)

	noise)?		No Condition is normal. (Recheck malfunction symptoms.)
5	<b>INSPECT A/C COMPRESSOR NOISE TIME</b> <ul style="list-style-type: none"> <li>Is noise heard continuously for <b>more than 3 s</b> after A/C compressor comes on?</li> </ul>	Yes	Go to the next step.
		No	Condition is normal. (Noise occurs for <b>2—3 s</b> immediately after A/C compressor turns on.)
6	<b>INSPECT IDLE SPEED</b> <ul style="list-style-type: none"> <li>Inspect idle speed. (See <b>ENGINE TUNE-UP [LF]</b>)</li> <li>Is it okay?</li> </ul>	Yes	Go to the next step.
		No	Follow the repair instruction described in section F, then go to Step 19.
7	<b>INSPECT REFRIGERANT AMOUNT</b> <ul style="list-style-type: none"> <li>Inspect refrigerant amount.</li> <li>Is it okay?</li> </ul>	Yes	Go to Step 10.
		No	Go to the next step.
8	<b>INSPECT REFRIGERANT LINES</b> <ul style="list-style-type: none"> <li>Inspect refrigerant lines. <ul style="list-style-type: none"> <li>Is piping free of damage and cracks?</li> <li>Are piping connections free of oil grime? (Visual inspection)</li> <li>Are piping connections free of gas leakage?</li> <li>Are piping installation points on condenser free of gas leakage?</li> <li>Are piping installation points on receiver/drier free of gas leakage?</li> </ul> </li> </ul>	Yes	Go to the next step.
		No	<p>If piping or A/C component(s) is damaged or cracked, replace then go to Step 19.</p> <p>If there is gas leakage, repair or replace connection and replace condenser<sup>*1</sup>, then go to Step 19.</p>

	<ul style="list-style-type: none"> <li>▪ Are piping installation points on A/C compressor free of gas leakage?</li> <li>▪ Are piping installation points on A/C unit free of gas leakage?</li> <li>▪ Perform gas leak inspection using gas leak tester.</li> </ul> <ul style="list-style-type: none"> <li>• Are above items okay?</li> </ul>		
9	<b>INSPECT EVAPORATOR PIPING CONNECTIONS IN A/C UNIT FOR GAS LEAKAGE</b> <ul style="list-style-type: none"> <li>• Are piping connections for evaporator in A/C unit free of gas leakage?</li> </ul>	Yes	Adjust refrigerant amount to specified level, then go to Step 19.
		No	If piping is damaged or cracked, replace then go to Step 19.  If there is gas leakage, repair or replace connection and replace condenser <sup>*1</sup> , then go to Step 19.
10	<b>CHECK TO SEE WHETHER MALFUNCTION IS IN COMPRESSOR OIL OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>• Add <b>20 ml { 20 cc, 0.8 fl oz }</b> of compressor oil.</li> <li>• Is noise heard when racing engine?</li> </ul>	Yes	Go to the next step.
		No	Troubleshooting completed.  Explain repair to customer.
11	<b>CHECK TO SEE WHETHER MALFUNCTION IS IN A/C COMPRESSOR OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>• Drain compressor oil.</li> <li>• Is it contaminated with metal particles?</li> </ul>	Yes	Go to the next step.
		No	Replace A/C compressor, then go to Step 19. (See <a href="#">A/C COMPRESSOR REMOVAL/INSTALLATION.</a> )
12	<b>CHECK TO SEE WHETHER MALFUNCTION IS SOMEWHERE IN A/C SYSTEM OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>• Is compressor oil whitish and mixed with water?</li> </ul>	Yes	Replace A/C compressor, evaporator, expansion valve, condenser and refrigerant line, then go to Step 19. (See <a href="#">A/C COMPRESSOR REMOVAL/INSTALLATION.</a> ) (See <a href="#">A/C UNIT DISASSEMBLY/ASSEMBLY.</a> ) (See <a href="#">CONDENSER REMOVAL/INSTALLATION.</a> ) (See <a href="#">REFRIGERANT LINE</a>

			<b>REMOVAL/INSTALLATION.)</b>
		No	Go to the next step.
13	<b>INSPECT A/C COMPRESSOR OIL</b> <ul style="list-style-type: none"> <li>Is compressor oil darker than normal and contaminated with aluminum chips?</li> </ul>	Yes	Replace A/C compressor and condenser, then go to Step 19. (Since A/C compressor may be worn and receiver/drier may be clogged, replacement of receiver/drier is necessary.) (See <b>A/C COMPRESSOR REMOVAL/INSTALLATION.)</b> (See <b>CONDENSER REMOVAL/INSTALLATION.)</b> )
		No	Condition is normal. Recheck malfunction symptoms.
14	<b>CHECK TO SEE WHETHER MALFUNCTION IS IN A/C COMPRESSOR OR ELSEWHERE</b> <ul style="list-style-type: none"> <li>Is noise heard immediately after A/C compressor is stopped?</li> </ul>	Yes	Replace A/C compressor, then go to Step 19. (A/C compressor discharge valve left open) (See <b>A/C COMPRESSOR REMOVAL/INSTALLATION.)</b> )
		No	Go to the next step.
15	<b>INSPECT DRIVE BELT</b> <ul style="list-style-type: none"> <li>Inspect drive belt. (See <b>DRIVE BELT INSPECTION [LF].</b>)</li> <li>Is it okay?</li> </ul>	Yes	Go to the next step.
		No	Adjust or replace drive belt, then go to Step 19.
16	<b>INSPECT DRIVE BELT CONDITION</b> <ul style="list-style-type: none"> <li>Is drive belt worn?</li> <li>Does it have foreign material imbedded in it, or have oil on it?</li> </ul>	Yes	Remove obstruction, remove oil, or replace drive belt, then go to Step 19.
		No	Go to the next step.
17	<b>INSPECT MAGNETIC CLUTCH</b> <ul style="list-style-type: none"> <li>Inspect magnetic clutch. (See <b>MAGNETIC CLUTCH INSPECTION.)</b>)</li> <li>Is it okay?</li> </ul>	Yes	Replace A/C compressor (excluding pressure plate, A/C compressor pulley, and stator), then go to Step 19. (See <b>A/C COMPRESSOR REMOVAL/INSTALLATION.)</b> )
		No	Replace magnetic clutch, then go to Step 19. (See <b>MAGNETIC CLUTCH DISASSEMBLY/ASSEMBLY.)</b> )
18	<b>CHECK TO SEE WHETHER MALFUNCTION IS IN A/C COMPRESSOR OR REFRIGERANT LINES</b> <ul style="list-style-type: none"> <li>Is noise emitted from A/C compressor?</li> </ul>	Yes	Visually inspect A/C compressor, replace appropriate parts if necessary, then go to the next step.
		No	If noise is due to refrigerant lines, repair detached or missing clips, tighten loose bolts, then go to the

			next step.
19	<b>VERIFY THAT MALFUNCTION SYMPTOM OCCURS AFTER REPAIR</b> <ul style="list-style-type: none"><li>Has A/C compressor noise stopped?</li></ul>	Yes	Troubleshooting completed.  Explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

\*1

If there is gas leakage, air enters into the A/C system. The desiccant within the receiver/drier absorbs the moisture from the air and becomes saturated. If the A/C system is used in this condition, the inside of the A/C compressor will begin to rust due to this moisture, which may cause lock up or noise to occur. Therefore, replacement of the receiver/drier is necessary.

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## 2008 - MX-5 - HVAC

### REFRIGERANT SYSTEM SERVICE WARNINGS

#### Using/Handling Unapproved Refrigerant

- Using a flammable refrigerant, such as OZ-12, in this vehicle is dangerous. In an accident, the refrigerant may catch fire, resulting in serious injury or death. When servicing this vehicle, use only R-134a.
- Checking for system leakage on a vehicle that has been serviced with flammable refrigerant, such as OZ-12, is dangerous. Conventional leak detectors use an electronically generated arc which can ignite the refrigerant, causing serious injury or death. If a flammable refrigerant may have been used to service the system, or if you suspect a flammable refrigerant has been used, contact the local fire marshal or EPA office for information on handling the refrigerant.

#### Handling Refrigerant

- Avoid breathing air conditioning refrigerant or lubricant vapor. Exposure may irritate eyes, nose and throat. Also, due to environmental concerns, use service equipment certified to meet the requirements of SAE J2210 (R-134a recycling equipment) when draining R-134a from the air conditioning system. If accidental system discharge occurs, ventilate work area before resuming service.
- Do not pressure test or leak test R-134a service equipment and/or vehicle air conditioning system with compressed air. Some mixtures of air and R-134a have been shown to be combustible at elevated pressures. These mixtures, if ignited, may cause injury or property damage. Additional health and safety information may be obtained from refrigerant manufacturers.
- Do not allow the refrigerant to leak near fire or any kind of heat. A poisonous gas may be generated if the refrigerant gas contacts fire or heat such as from cigarettes and heaters. When carrying out any operation that can cause refrigerant leakage, extinguish or remove the above mentioned heat sources and maintain adequate ventilation.
- Handling liquid refrigerant is dangerous. A drop of it on the skin can result in localized frostbite. When handling the refrigerant, wear gloves and safety goggles. If refrigerant splashes into the eyes, immediately wash them with clean water and consult a doctor.

#### Storing Refrigerant

- The refrigerant container is highly pressurized. If it is subjected to high heat, it could explode, scattering metal fragments and liquid refrigerant that can

seriously injure you. Store the refrigerant at temperatures below 40 °C {104 °F}.

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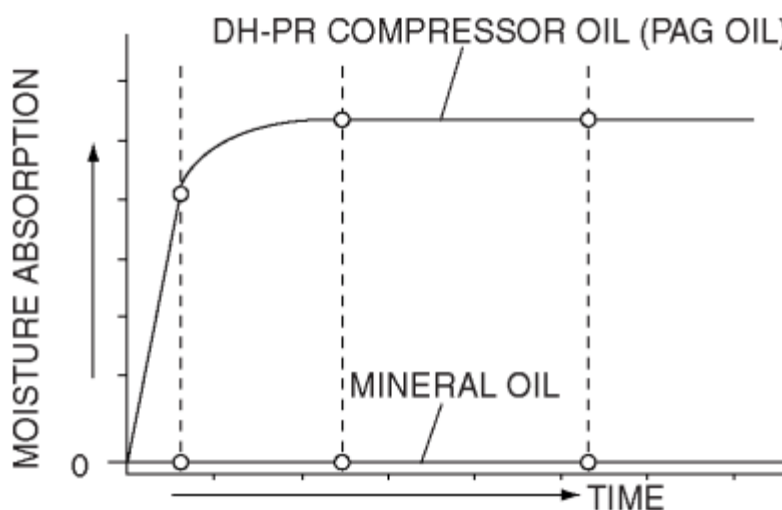


## 2008 - MX-5 - HVAC

### REFRIGERANT SYSTEM SERVICE CAUTIONS

#### Handling Compressor Oil

- Use only DH-PR compressor oil for this vehicle. Using PAG oil other than DH-PR compressor oil can damage the A/C compressor.
- Do not spill DH-PR compressor oil on the vehicle. A drop of compressor oil on the vehicle surface can eat away at the paint. If oil gets on the vehicle, wipe it off immediately.
- DH-PR compressor oil (PAG oil) has a higher moisture absorption efficiency than the previously used mineral oil. If moisture mixes with the compressor oil, the refrigerant system could be damaged. Therefore, install caps immediately after using the compressor oil or removing refrigerant system parts to prevent moisture absorption.

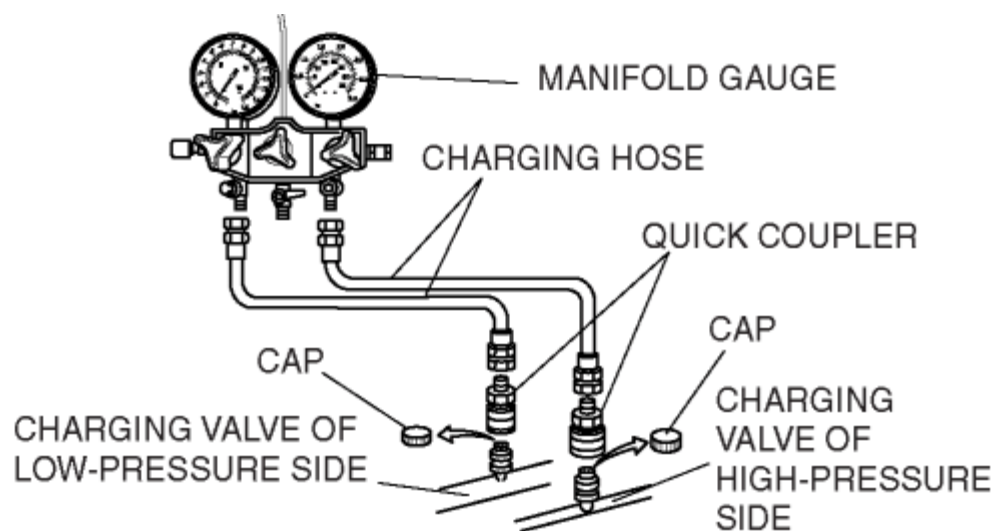


## 2008 - MX-5 - HVAC

### REFRIGERANT SYSTEM GENERAL PROCEDURES

#### Manifold Gauge Set Installation

1. Fully close the valves of the manifold gauge.
2. Connect the charging hoses to the high/low pressure side joints of the manifold gauge.



3. Connect the quick couplers to the ends of the charging hoses.
4. Connect the quick couplers to the charging valves.

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### REFRIGERANT CHARGING

#### WARNING:

- Avoid breathing air conditioning refrigerant or lubricant vapor. Exposure may irritate eyes, nose and throat. Also, due to environmental concerns, use service equipment certified to meet the requirements of SAE J2210 (R-134a recycling equipment) when draining R-134a from the air conditioning system. If accidental system discharge occurs, ventilate work area before resuming service.

#### CAUTION:

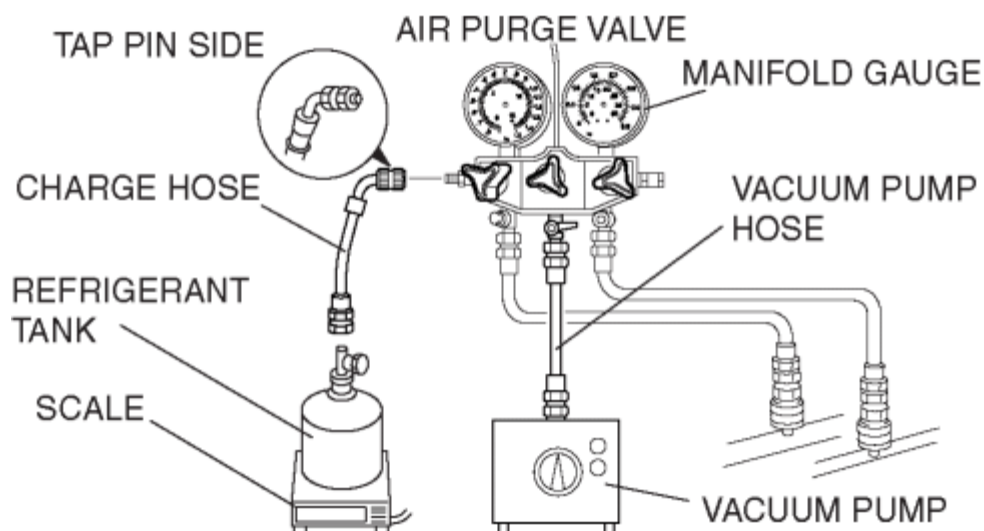
- Do not exceed the specification when charging the system with refrigerant. Doing so will decrease the efficiency of the air conditioner or damage the refrigeration cycle parts.

### Charging Recycled R-134a Refrigerant

1. Connect an R-134a recovery/recycling/recharging device to the vehicle and follow the device manufacturer's instructions.

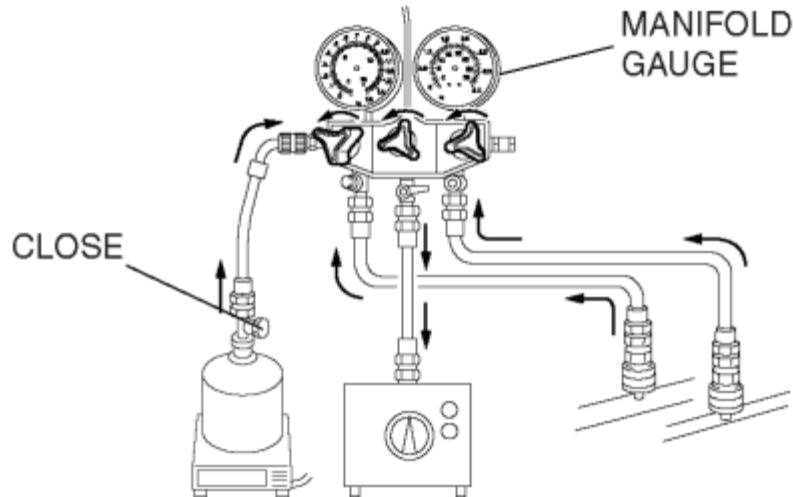
### Charging New R-134a Refrigerant

1. Install the manifold gauge set.
2. Connect the tap pin side of the charging hose to the air purge valve of the manifold gauge.



3. Connect the vacuum pump hose to the center joint of the manifold gauge.
4. Connect the vacuum pump hose to the vacuum pump.
5. Connect the charging hose to the refrigerant tank.

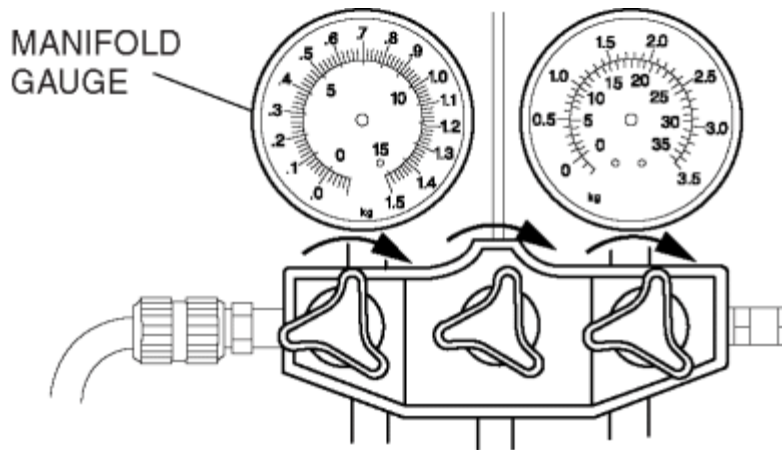
6. Place the refrigerant tank on the scale.
7. Open all the valves of the manifold gauge.



**CAUTION:**

- Close the manifold gauge valve immediately after stopping the vacuum pump. If the valve is left open, the vacuum pump oil will back flow into the refrigeration cycle and cause a decrease in the efficiency of the air conditioner.

8. Start the vacuum pump and let it operate for **15 min**.
9. Verify that high and low pressure side readings of the manifold gauge are at **-101 kPa {-760 mmHg, -29.9 inHg}**. Close each valve of the manifold gauge.



10. Stop the vacuum pump and wait for **5 min**.
11. Inspect the high and low pressure side readings of the manifold gauge.
  - If the reading has changed, inspect for leakage and then repeat from Step 7.
  - If the reading has not changed, go to next step.
12. Open the valve of the refrigerant tank.
13. Weigh the refrigerant tank to charge the suitable amount of refrigerant.

**Refrigerant type**

- R-134a

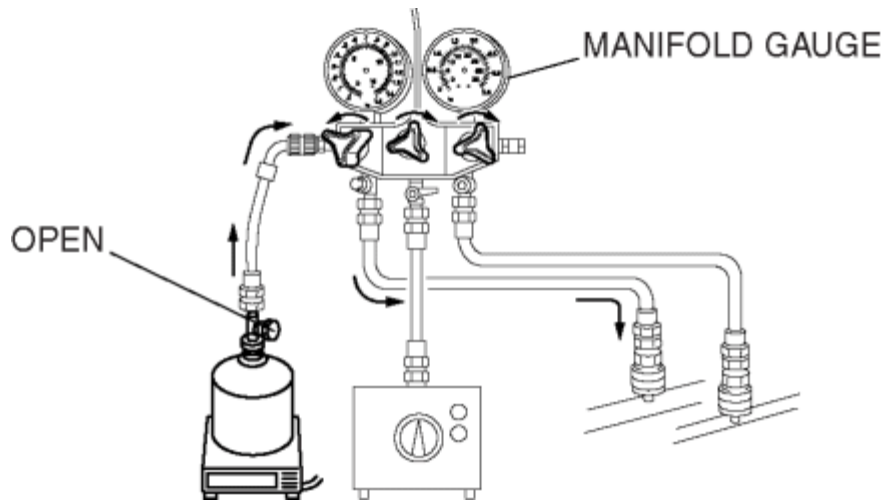
### Regular amount of refrigerant (approx. quantity)

- 450 g {15.9 oz}

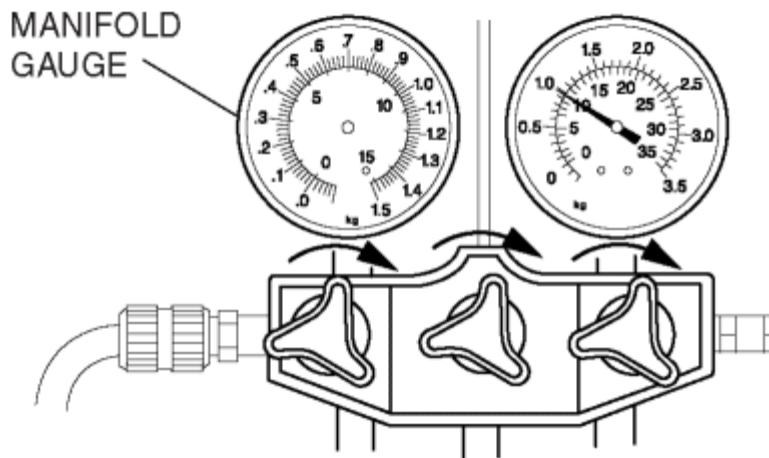
#### WARNING:

- If the refrigerant system is charged with a large amount of refrigerant when checking for gas leakage, and if any leakage should occur, the refrigerant will be released into the atmosphere. In order to prevent the accidental release of refrigerant which can destroy the ozone layer in the stratosphere, follow the proper procedures and charge with only a small amount of refrigerant when checking for gas leakage.
- If charging the system with refrigerant by service cans or refrigerant tank, running the engine with the high pressure side valve open is dangerous. Pressure within the service cans or refrigerant tank will increase and they could explode, scattering metal fragments and liquid refrigerant that can seriously injure you. Therefore, do not open the high pressure side valve while the engine is running.

14. Open the low pressure side valve of the manifold gauge.



15. When the high pressure side reading increases to **98 kPa {1.0 kgf/cm<sup>2</sup>, 14 psi}**, close the low pressure side valve of the manifold gauge.



16. Inspect for leakage from the cooler pipe/hose connections using a gas leak tester.

- If there is no leakage, go to Step 18.

- If leakage is found at a loose joint, tighten the joint, go to next step.

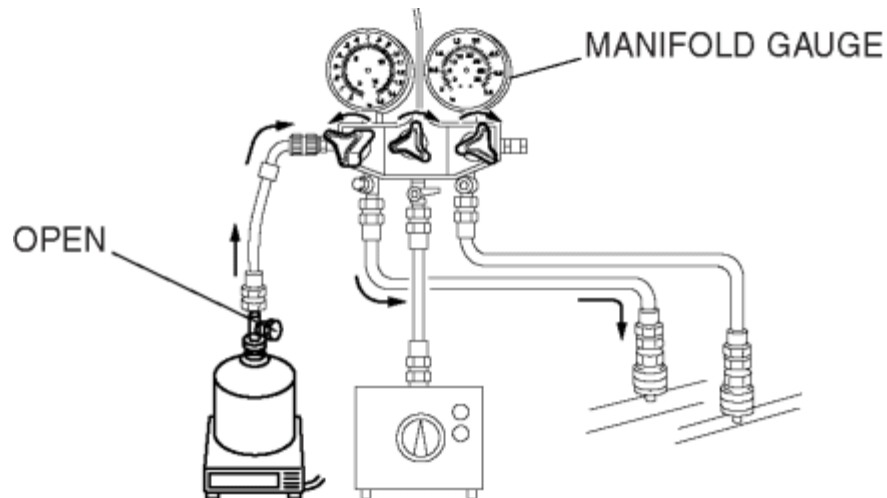
17. Inspect for leakage again.

- If there is no leakage after tightening the joint, go to next step.
- If there is still a leakage at the same joint, discharge the refrigerant and then repair the joint. Repeat the charging procedure from Step 7.

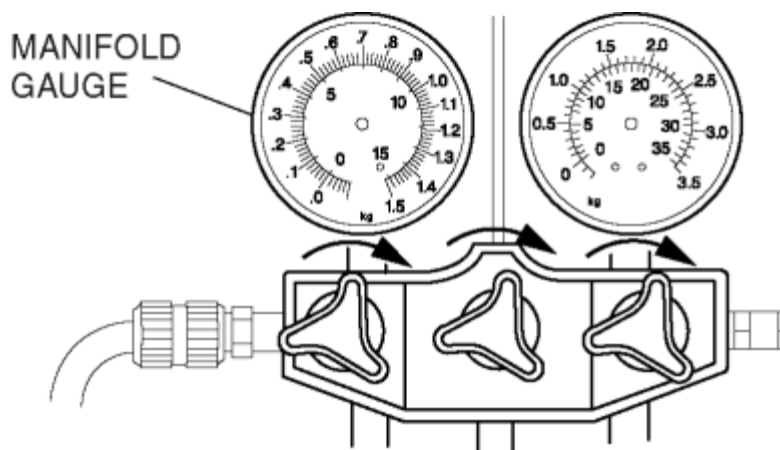
#### WARNING:

- If charging the system with refrigerant by service cans or refrigerant tank, running the engine with the high pressure side valve open is dangerous. Pressure within the service cans or refrigerant tank will increase and they could explode, scattering metal fragments and liquid refrigerant that can seriously injure you. Therefore, do not open the high pressure side valve while the engine is running.

18. Open the low pressure side valve of the manifold gauge and charge with refrigerant until the weight of refrigerant tank has decreased **200 g {7.06 oz}** from the amount in Step 13.



19. Close the low pressure side valve of the manifold gauge.



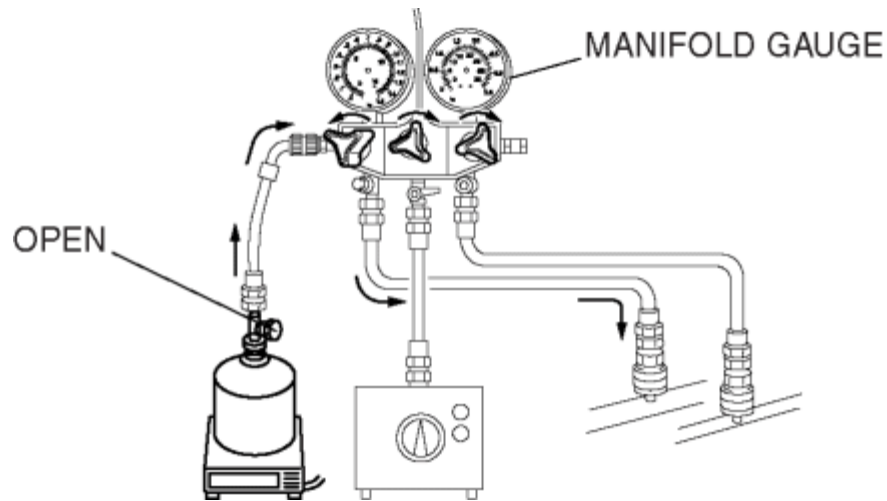
#### WARNING:

- If charging the system with refrigerant by service cans or refrigerant tank, running the engine with the high pressure side valve open is dangerous. Pressure within the service cans or refrigerant tank will increase and they could explode, scattering metal fragments and liquid refrigerant that can seriously injure you. Therefore, do not open the high pressure side valve while the

engine is running.

20. Start the engine and actuate the A/C compressor.

21. Open the low pressure side valve of the manifold gauge and charge with refrigerant until the weight of the refrigerant tank has decreased **450 g { 15.9 oz }** from the amount in Step 13.



22. Close the low pressure side valve of the manifold gauge and the valve of the refrigerant tank.

23. Stop the engine and A/C compressor.

24. Inspect for leakage using a gas leak tester.

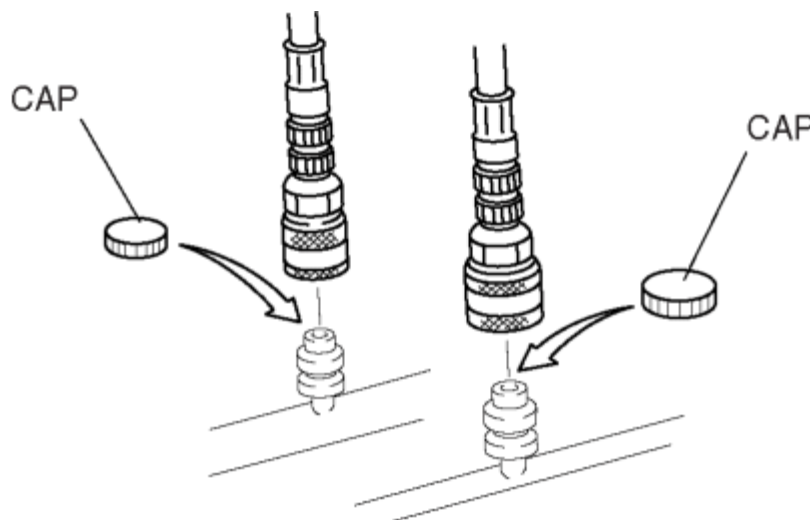
- If there is no leakage, go to Step 26.
- If leakage is found at a loose joint, tighten the joint, then go to next step.

25. Inspect for leakage again.

- If there is still leakage after tightening the joint, go to next step.
- If there is still leakage at the same joint, discharge the refrigerant and then repair the joint. Repeat the charging procedure from Step 7.

26. Remove the manifold gauge set.

27. Install the caps to the charging valves.



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### REFRIGERANT RECOVERY

#### WARNING:

- Avoid breathing air conditioning refrigerant or lubricant vapor. Exposure may irritate eyes, nose and throat. Also, due to environmental concerns, use service equipment certified to meet the requirements of SAE J2210 (R-134a recycling equipment) when draining R-134a from the air conditioning system. If accidental system discharge occurs, ventilate work area before resuming service.

1. Connect an R-134a recovery/recycling/recharging device to the vehicle and follow the device manufacturer's instructions.

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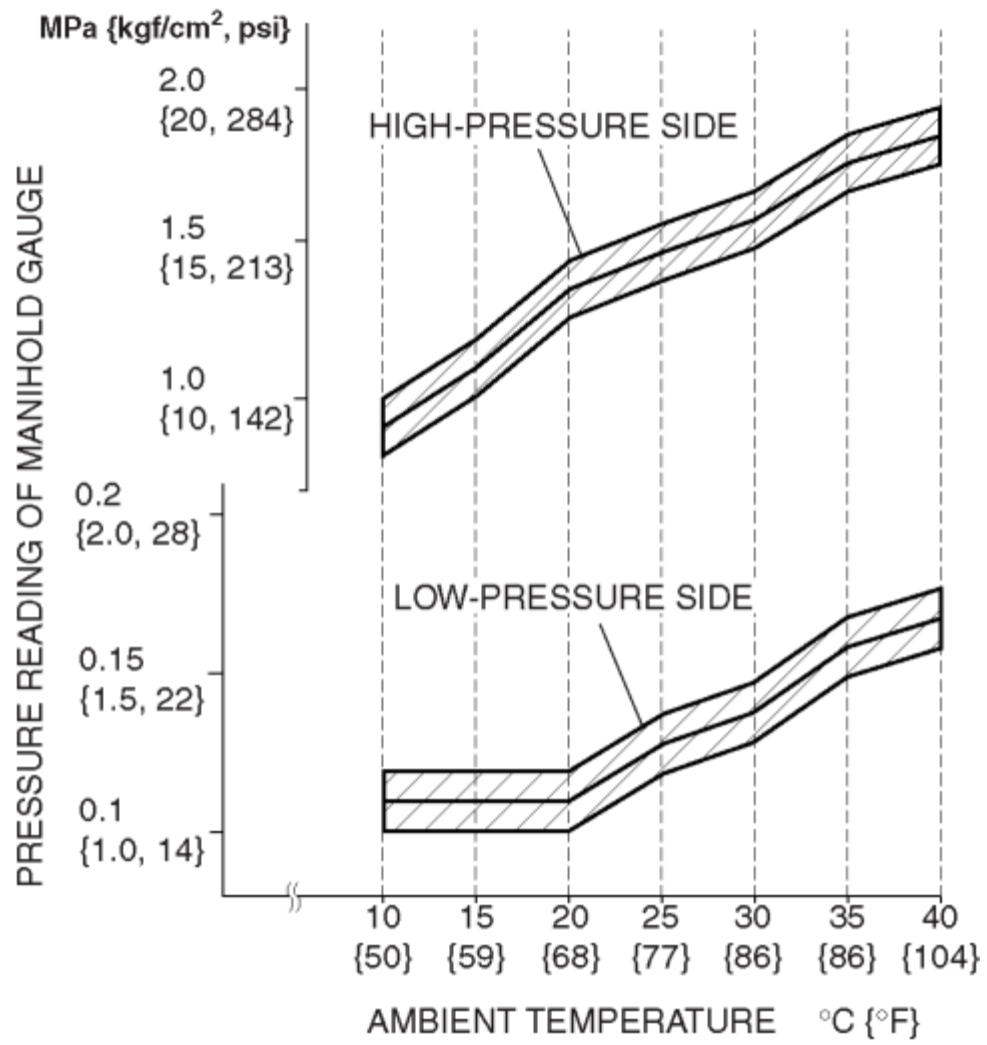
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### REFRIGERANT PRESSURE CHECK

1. Connect the manifold gauge.
2. Start the engine and allow it to reach operating temperature.
3. During pressure check, run the engine at a constant **1,500 rpm**.
4. Set the fan speed MAX-HI.
5. Turn the A/C switch on.
6. Set to RECIRCULATE mode.
7. Set the temperature control to MAX COLD.
8. Set to VENT mode.
9. Close all the doors and all the windows.
10. Measure the manifold gauge reading and ambient temperature.
11. Verify that the high and low pressure readings are within each shaded zone.
  - If there is any malfunction, inspect the refrigerant system according to the troubleshooting chart.



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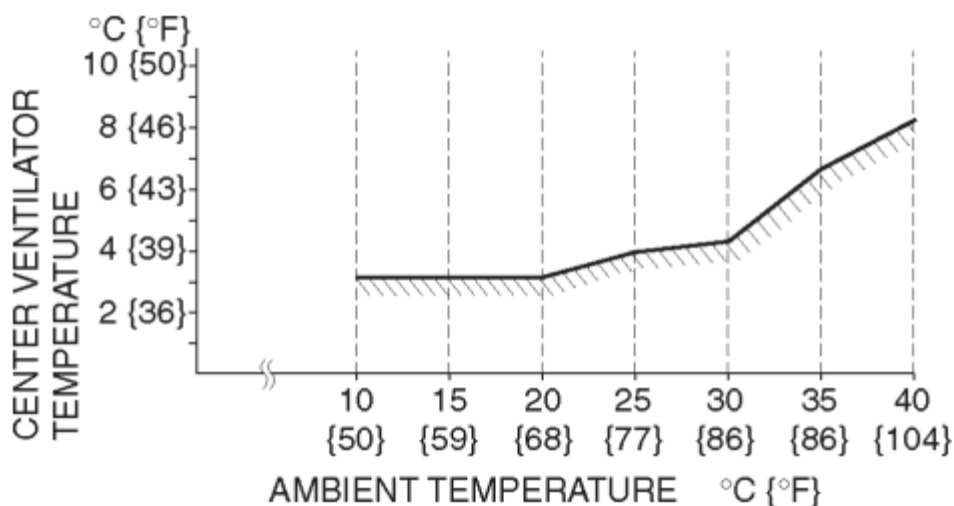
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### REFRIGERANT SYSTEM PERFORMANCE TEST

1. Inspect the refrigerant pressure. (See [REFRIGERANT PRESSURE CHECK.](#))
2. Place a dry-bulb thermometer in the driver-side center ventilator outlet.
3. Start the engine and allow it to reach operating temperature.
4. During pressure check, run the engine at a constant **1,500 rpm**.
5. Set the fan speed MAX-HI.
6. Turn the A/C switch on.
7. Set to RECIRCULATE mode.
8. Set the temperature control to MAX COLD.
9. Set to VENT mode.
10. Close all the doors and windows.
11. Wait until the air conditioner output temperature stabilizes.

#### Stabilized condition

- The A/C compressor repeatedly turns on and off at regular intervals.
12. After the blower air is stabilized, read the dry-bulb thermometer.
  13. Verify the ambient temperature.
  14. Verify that the temperature reading is in the shaded zone.
    - If there is any malfunction, inspect the refrigerant system according to the troubleshooting chart.



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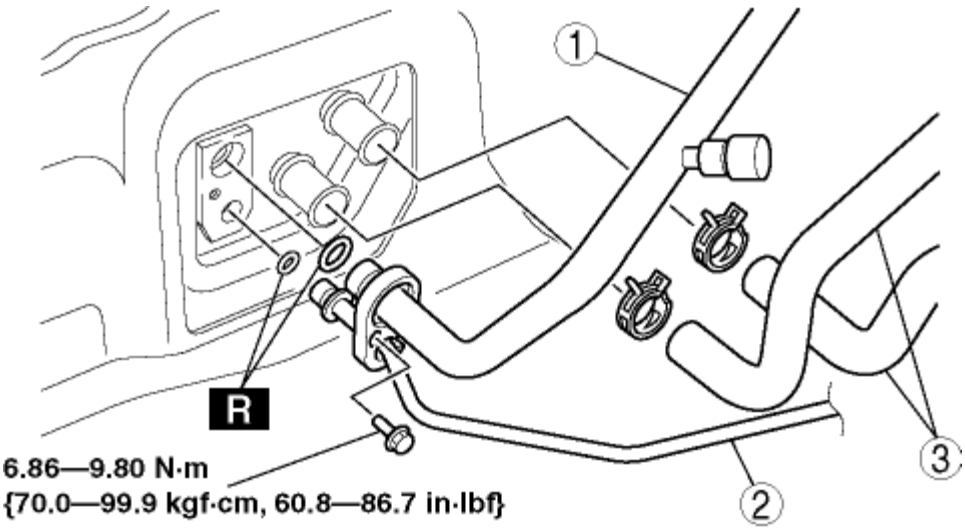
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A/C UNIT REMOVAL/INSTALLATION

- 1. Remove battery cover.
- 2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
- 3. Discharge the refrigerant from the system. (See [REFRIGERANT RECOVERY.](#)) (See [REFRIGERANT CHARGING.](#))
- 4. Drain the engine coolant. (See [ENGINE COOLANT REPLACEMENT \[LF\].](#))
- 5. Disconnect from A/C unit in the order in the table.

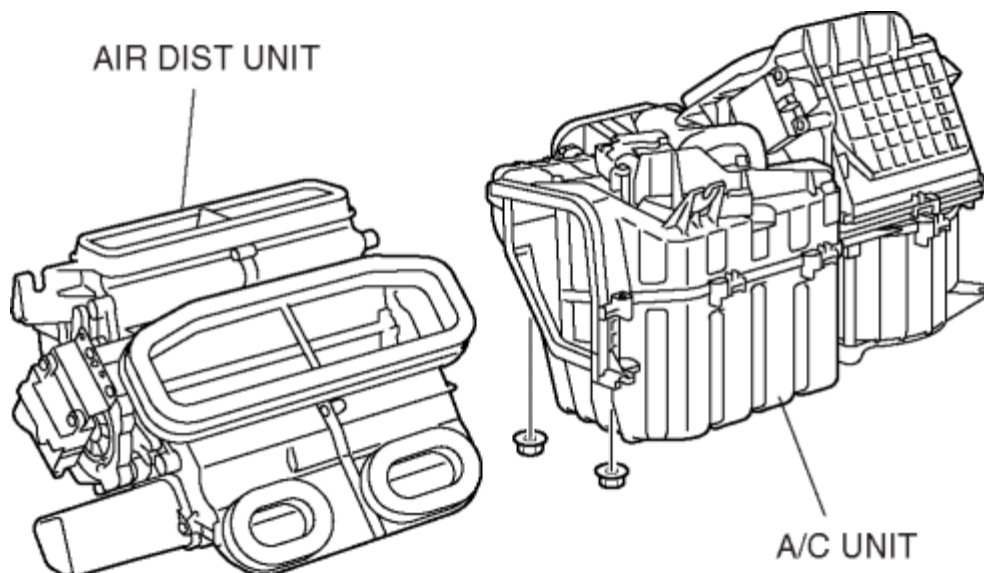
CAUTION:

- If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise or other malfunction could occur. Always plug open fittings immediately after removing any refrigeration cycle parts.



1	Cooler pipe No.3 (LO) (See <a href="#">REFRIGERANT LINE REMOVAL/INSTALLATION.</a> ) (See <a href="#">REFRIGERANT LINE REMOVAL/INSTALLATION.</a> )
2	Cooler pipe No.2 (HI) (See <a href="#">REFRIGERANT LINE REMOVAL/INSTALLATION.</a> ) (See <a href="#">REFRIGERANT LINE REMOVAL/INSTALLATION.</a> )

6. Remove the A/C unit and air dist unit. (See [AIR DIST UNIT REMOVAL/INSTALLATION.](#))
7. Disassembly the A/C unit as shown in the figure.



8. Install in the reverse order of removal.
9. Perform the refrigerant system performance test. (See [REFRIGERANT SYSTEM PERFORMANCE TEST.](#))

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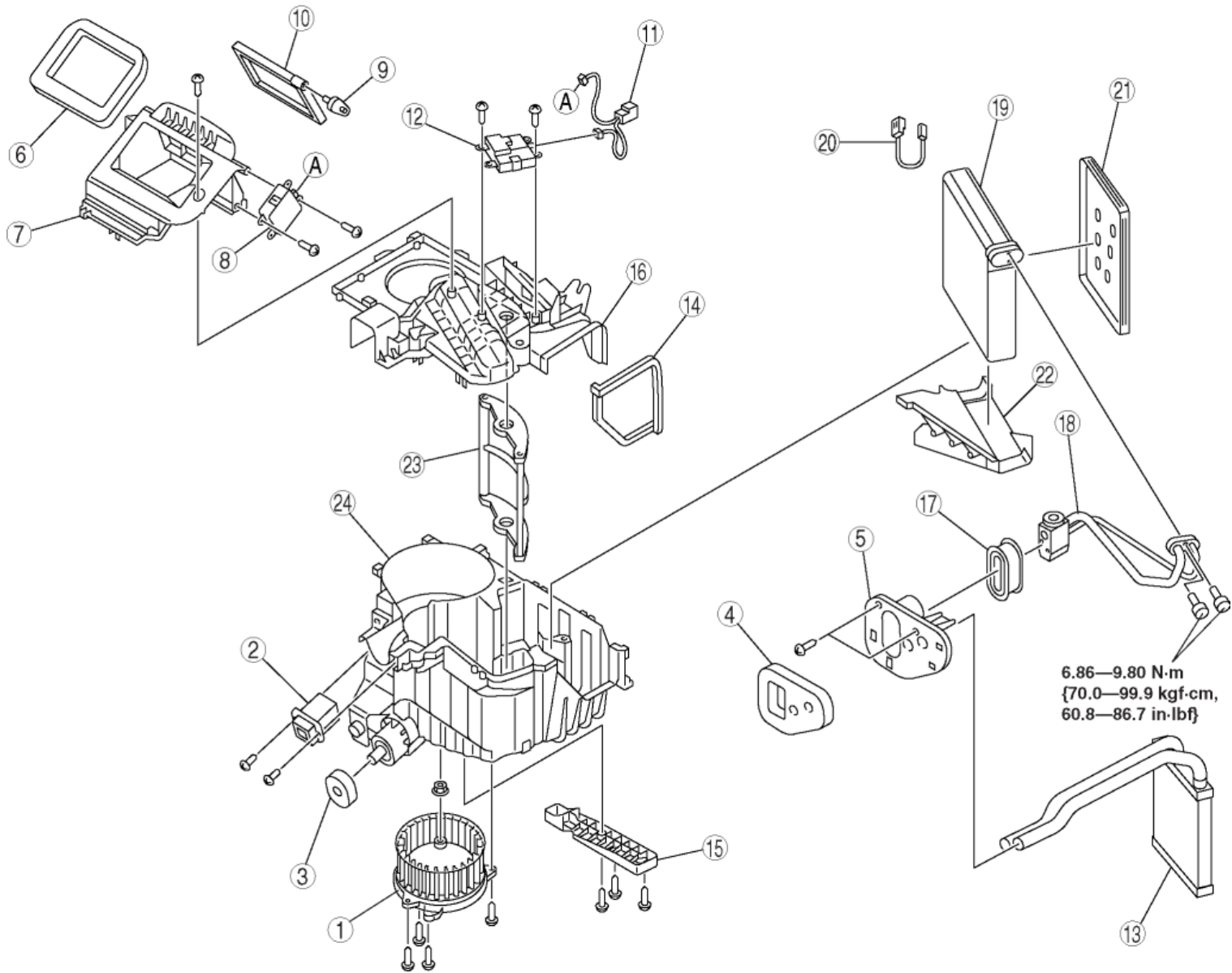
A/C UNIT DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.

CAUTION:

- If a non-specified grease is used, it may result in abnormal noise or improper operation of the links. Apply only the specified grease to each link.
- If the air mix damper is removed and reinstalled improperly because the original installation position cannot be specified, the air mix damper and air mix actuator may be damaged when it is operated. Therefore, set the air mix to the middle position before disassembling so that the installation position can be specified.

2. Assemble in the reverse order of disassembly.



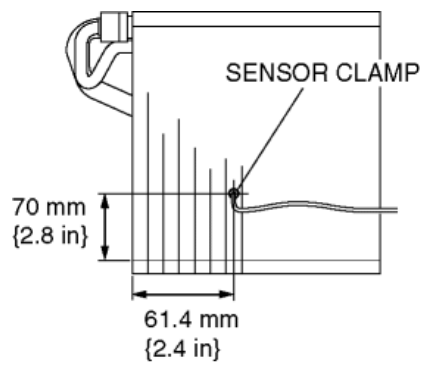
1	Blower motor
2	Power MOS FET



3	Polyurethane foam (1)
4	Polyurethane foam (2)
5	Cover (1)
6	Adhesive polyurethane (1)
7	Air intake box
8	Air intake actuator
9	Air intake crank
10	Air intake door
11	Harness
12	Air mix actuator
13	Heater core
14	Adhesive polyurethane (2)
15	Cover (2)
16	A/C case (1)
17	Cover (3)
18	Expansion valve
19	Evaporator
20	Evaporator temperature sensor (See <a href="#">A/C UNIT DISASSEMBLY/ASSEMBLY.</a> )
21	Cover (4)
22	Insulator
23	Air mix damper
24	A/C case (2)

### Evaporator Temperature Sensor Assembly Note

1. Assemble the evaporator temperature sensor as shown in the figure.



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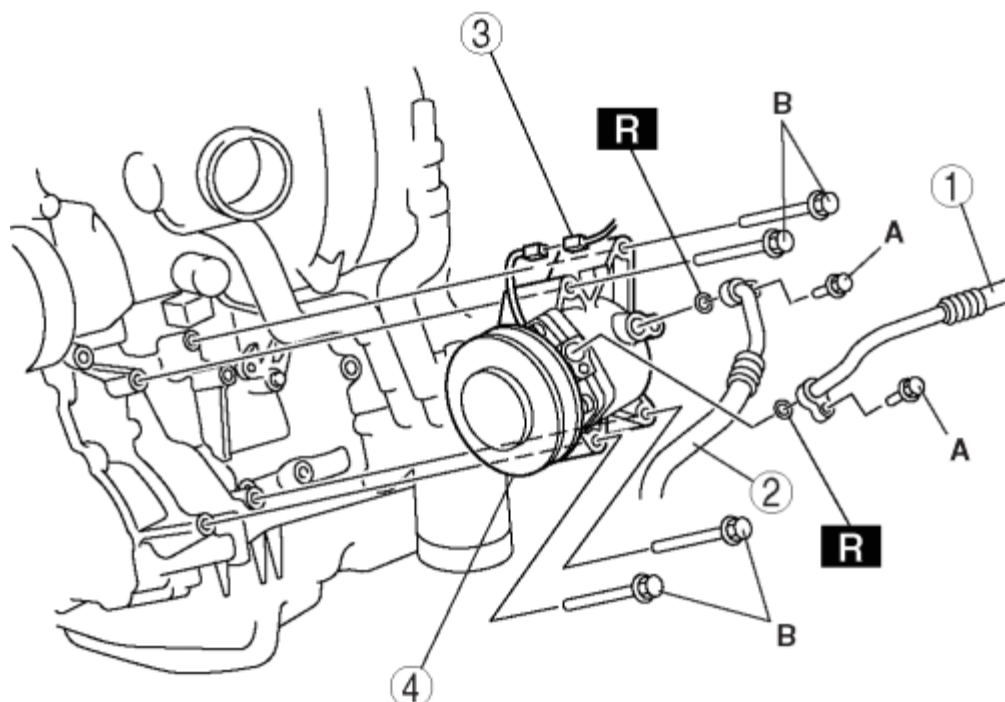
## 2008 - MX-5 - HVAC

### A/C COMPRESSOR REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Discharge the refrigerant from the system. (See [REFRIGERANT CHARGING](#).)
4. Remove the air cleaner. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
5. Remove the PCM. (See [PCM REMOVAL/INSTALLATION \[LF\]](#).)
6. Remove the drive belt. (See [DRIVE BELT REPLACEMENT \[LF\]](#).)
7. Do not allow remaining compressor oil in the A/C compressor and pipes to spill, and remove in the order indicated in the table.

#### CAUTION:

- If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise or other malfunction could occur. Always plug open fittings immediately after removing any refrigeration cycle parts.



A: 6.86—9.80 N·m {70.0—99.9 kgf·cm, 60.8—86.7 in·lbf}

B: 17.6—26.5 N·m {1.80—2.70 kgf·m, 13.0—19.5 ft·lbf}

	(See <a href="#">REFRIGERANT LINE REMOVAL/INSTALLATION.</a> )
	(See <a href="#">REFRIGERANT LINE REMOVAL/INSTALLATION.</a> )
2	Cooler hose (HI) (See <a href="#">REFRIGERANT LINE REMOVAL/INSTALLATION.</a> ) (See <a href="#">REFRIGERANT LINE REMOVAL/INSTALLATION.</a> )
3	A/C compressor connector
4	A/C compressor (See <a href="#">A/C UNIT REMOVAL/INSTALLATION.</a> )

8. Install in the reverse order of removal.

9. Perform the refrigerant system performance test. (See [REFRIGERANT SYSTEM PERFORMANCE TEST.](#))

## A/C Compressor Installation Note

### CAUTION:

- Due to the high moisture-absorption characteristics of the compressor oil, it may absorb moisture if left over a long period of time thereby negatively affecting A/C operation. Drain the compressor oil and refill within 10 min. of each other.
1. Rotate new A/C compressor shaft six to eight revolutions while draining new refrigerant oil in a clean measuring device. Use this refrigerant oil to refill new compressor. Do not allow refrigerant oil to become contaminated.
  2. Rotate old A/C compressor shaft six to eight revolutions while draining old refrigerant oil in a separate, clean measuring device.
  3. Compare those oil amounts. The amount of the oil drained from the new A/C compressor should be greater than the old one.
  4. Pour the same amount oil of drained from the old A/C compressor back into the new A/C compressor.

#### A/C compressor oil type

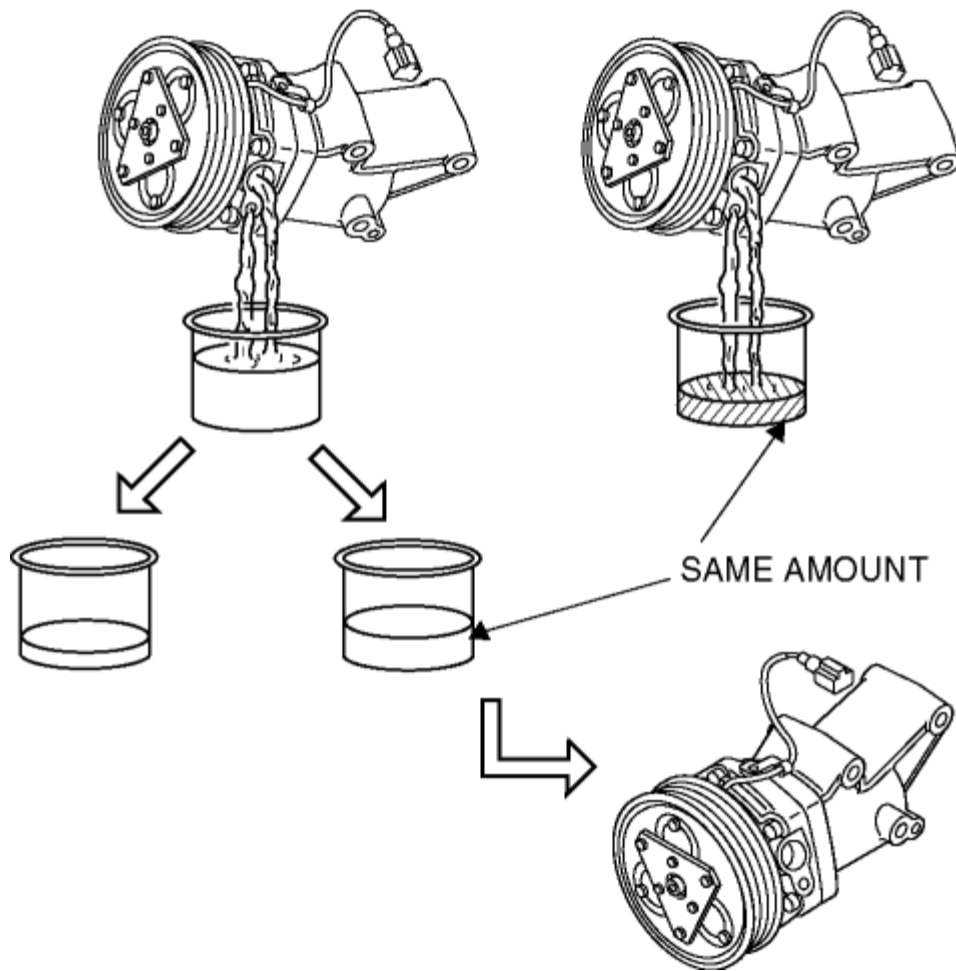
- DH-PR

#### A/C compressor oil sealed volume (approx. quantity)

- 130 ml {130 cc, 4.39 fl oz}

NEW A/C COMPRESSOR

OLD A/C COMPRESSOR



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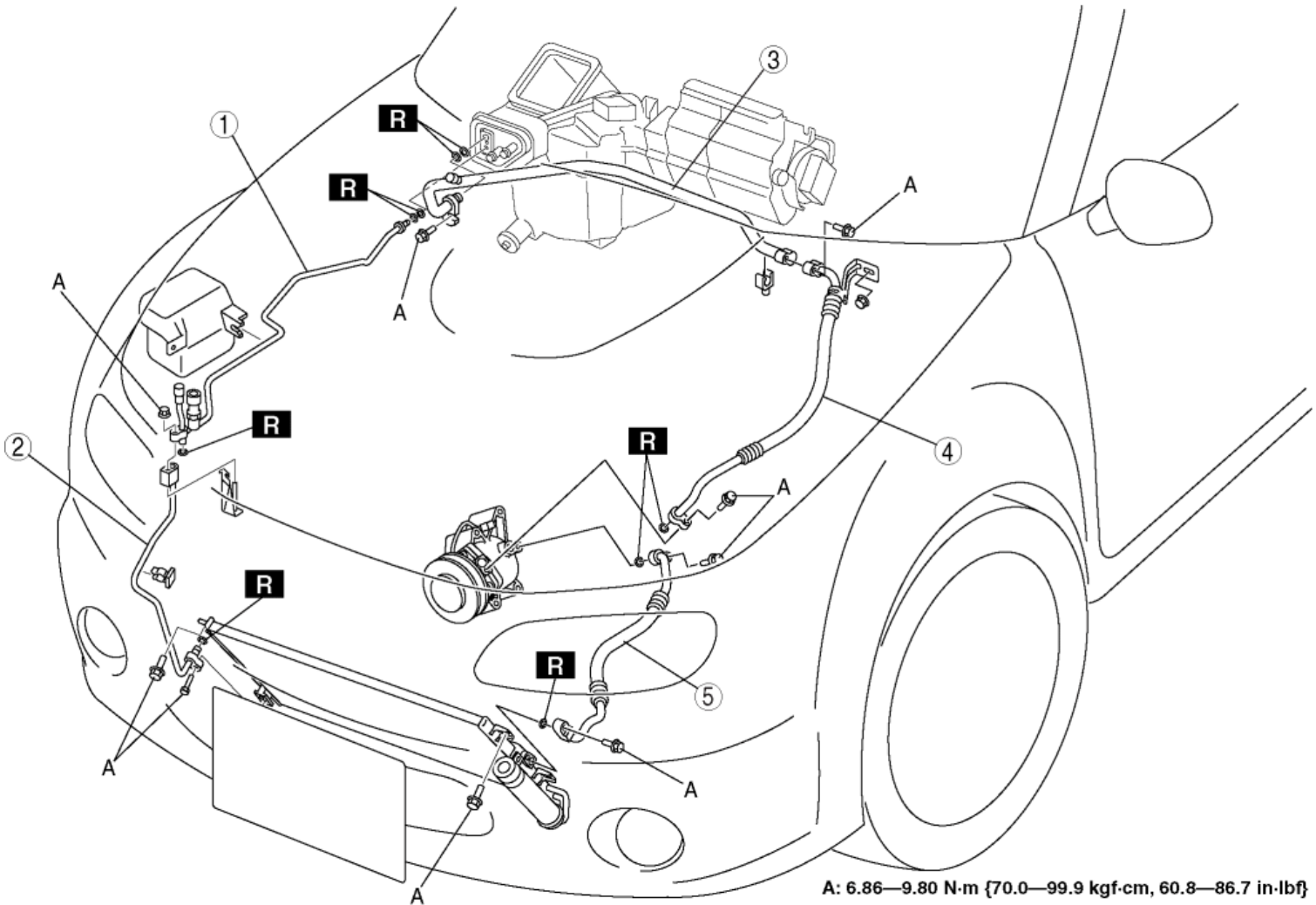
## 2008 - MX-5 - HVAC

### REFRIGERANT LINE REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Discharge the refrigerant from the system. (See [REFRIGERANT CHARGING](#).)
4. Remove the air cleaner. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[LF\]](#).)
5. Remove the splash shield.
6. Remove the under cover.
7. Do not allow remaining compressor oil in the piping and connecting parts to spill, and remove in the order indicated in the table.

#### CAUTION:

- If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise or other malfunction could occur. Always plug open fittings immediately after removing any refrigeration cycle parts.



1 Cooler pipe No.2 (HI)

(See [REFRIGERANT LINE REMOVAL/INSTALLATION](#).)

(See [REFRIGERANT LINE REMOVAL/INSTALLATION](#).)

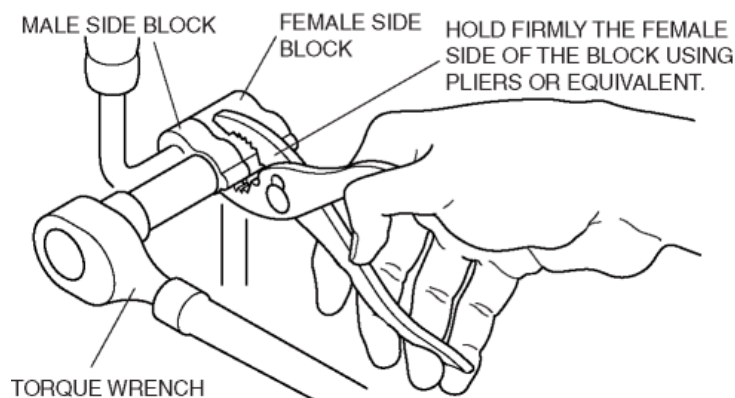
2 Cooler pipe No.1 (HI)
(See <a href="#">REFRIGERANT LINE REMOVAL/INSTALLATION.</a> )
(See <a href="#">REFRIGERANT LINE REMOVAL/INSTALLATION.</a> )
3 Cooler pipe No.3 (LO)
(See <a href="#">REFRIGERANT LINE REMOVAL/INSTALLATION.</a> )
(See <a href="#">REFRIGERANT LINE REMOVAL/INSTALLATION.</a> )
4 Cooler hose (LO)
(See <a href="#">REFRIGERANT LINE REMOVAL/INSTALLATION.</a> )
(See <a href="#">REFRIGERANT LINE REMOVAL/INSTALLATION.</a> )
5 Cooler hose (HI)
(See <a href="#">REFRIGERANT LINE REMOVAL/INSTALLATION.</a> )
(See <a href="#">REFRIGERANT LINE REMOVAL/INSTALLATION.</a> )

8. Install in the reverse order of removal.

9. Perform the refrigerant system performance test. (See [REFRIGERANT SYSTEM PERFORMANCE TEST.](#))

### Refrigerant Line Removal Note

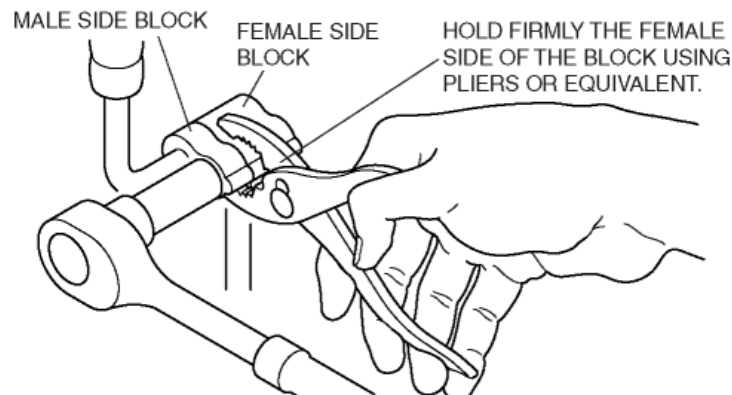
1. Disconnect the block joint type pipes by grasping the female side of the block with pliers or similar tool and holding firmly, and then remove the connection bolt or nut.



### Refrigerant Line Installation Note

1. Temporarily tighten the joint bolt by hand.

2. Connect the block joint type pipes by grasping the female side of the block with pliers or similar tool and holding firmly, and then tighten the connection bolt or nut with a torque wrench.







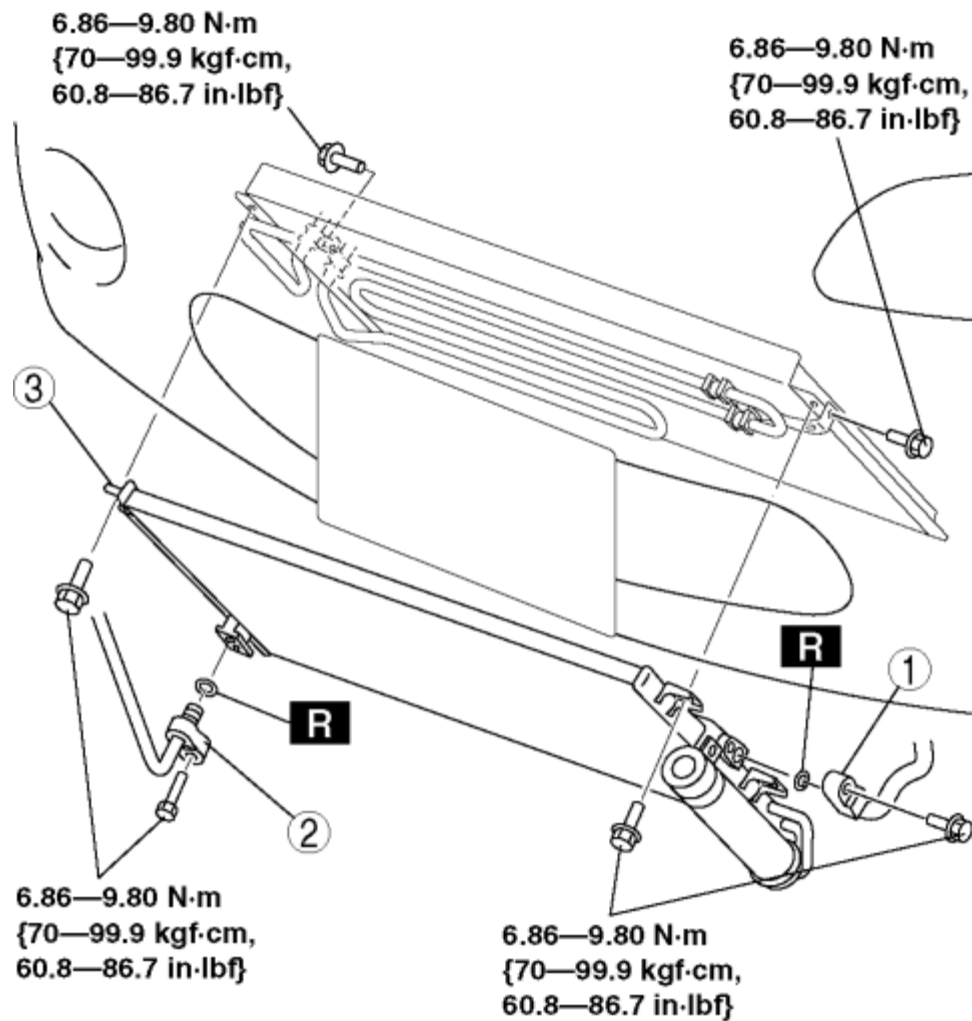
## 2008 - MX-5 - HVAC

### CONDENSER REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Discharge the refrigerant from the system. (See [REFRIGERANT CHARGING](#).)
4. Remove the splash shields.
5. Remove the under cover.
6. Remove the cooling pipe installation bolts.
7. Do not allow remaining compressor oil in the condenser and pipes to spill, and remove in the order indicated in the table.

#### CAUTION:

- If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise or other malfunction could occur. Always plug open fittings immediately after removing any refrigeration cycle parts.



1	Cooler hose (HI) (See <a href="#">REFRIGERANT LINE REMOVAL/INSTALLATION.</a> ) (See <a href="#">REFRIGERANT LINE REMOVAL/INSTALLATION.</a> )
2	Cooler pipe No.1 (HI) (See <a href="#">REFRIGERANT LINE REMOVAL/INSTALLATION.</a> ) (See <a href="#">REFRIGERANT LINE REMOVAL/INSTALLATION.</a> )
3	Condenser (See <a href="#">CONDENSER REMOVAL/INSTALLATION.</a> )

8. Install in the reverse order of removal.

9. Perform the refrigerant system performance test. (See [REFRIGERANT SYSTEM PERFORMANCE TEST.](#))

## Condenser Installation Note

1. When replacing the new condenser, add compressor oil to the refrigeration cycle.

### **Supplemental amount (approx. quantity)**

- 20 ml {20 cc, 0.7 fl oz}

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## 2008 - MX-5 - HVAC

### CONDENSER INSPECTION

1. Inspect the condenser for cracks, damage, and oil leakage.
  - If there is any malfunction, replace the condenser.
2. Visually inspect the fins for clogging of foreign material.
  - If any fins are clogged, remove the foreign material.
3. Visually inspect the fins for bending.
  - If there is any bending, use the end of a flathead screwdriver to straighten fins.

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## 2008 - MX-5 - HVAC

### EVAPORATOR INSPECTION

1. Inspect the evaporator for damage, cracks and oil leakage.
  - If there is any malfunction, replace the evaporator.
2. Visually inspect the fins for bending.
  - If there is any bending, use the end of a flathead screwdriver to straighten the fins.

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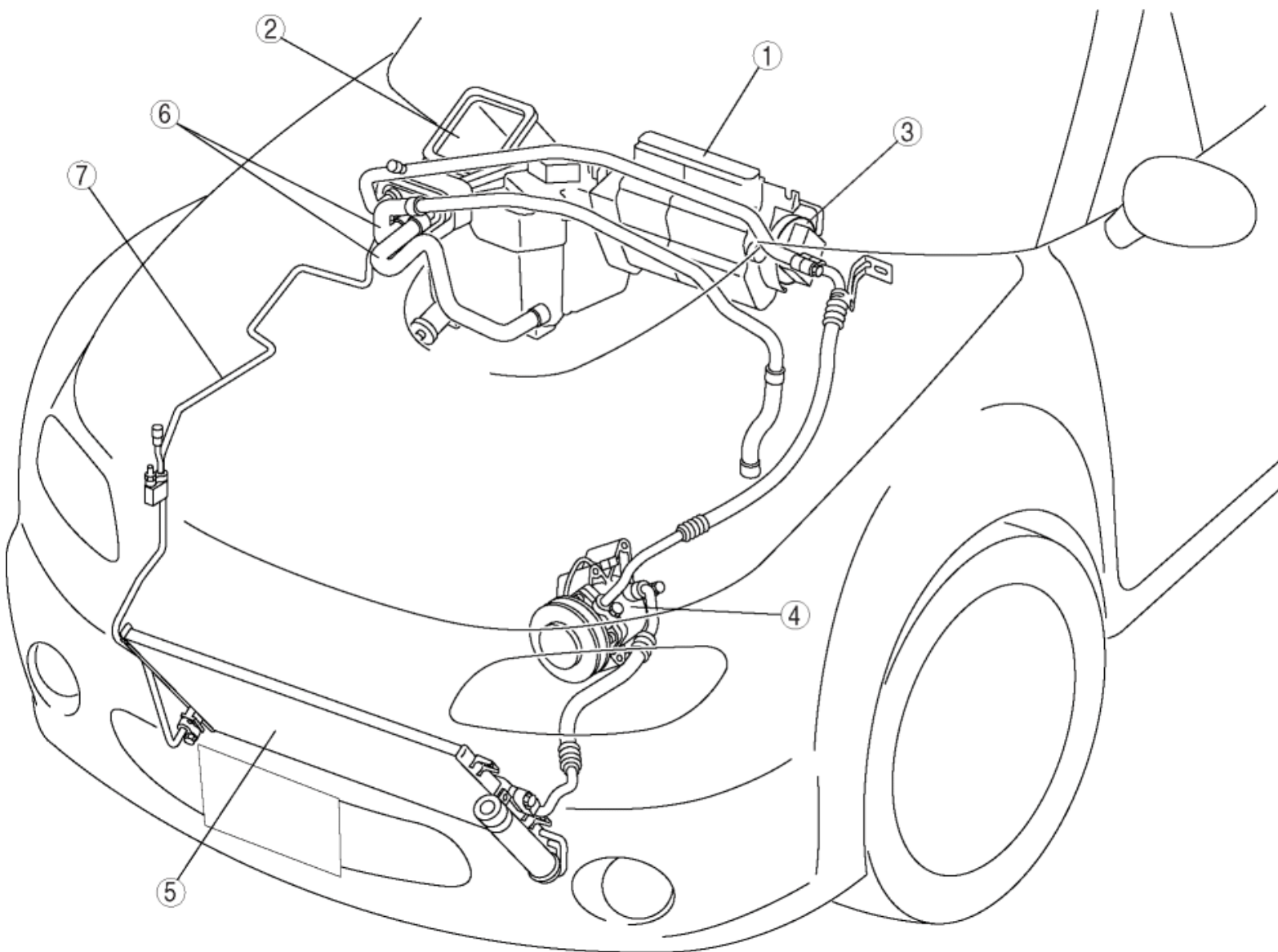
## 2008 - MX-5 - HVAC

### HEATER CORE INSPECTION

1. Inspect the heater core for damage, cracks and water leakage.
  - If there is any malfunction, replace the heater core.
2. Visually inspect the fins for bending.
  - If there is any bending, use the end of a flathead screwdriver to straighten the fins.
3. Visually inspect the heater hose for deformation.
  - Repair with pliers if there is deformation. If there is any malfunction, replace the heater core.

## 2008 - MX-5 - HVAC

### HVAC BASIC SYSTEM LOCATION INDEX



1 Air dist unit

(See [AIR DIST UNIT REMOVAL/INSTALLATION.](#))

(See [AIR DIST UNIT DISASSEMBLY/ASSEMBLY.](#))

2 A/C unit

(See [A/C UNIT REMOVAL/INSTALLATION.](#))

(See [A/C UNIT DISASSEMBLY/ASSEMBLY.](#))

(See [EVAPORATOR INSPECTION.](#))

	(See <a href="#">HEATER CORE INSPECTION.</a> )
3	Airflow mode main link (See <a href="#">AIRFLOW MODE MAIN LINK REMOVAL/INSTALLATION.</a> )
4	A/C compressor (See <a href="#">A/C COMPRESSOR REMOVAL/INSTALLATION.</a> )
5	Condenser (See <a href="#">CONDENSER REMOVAL/INSTALLATION.</a> ) (See <a href="#">CONDENSER INSPECTION.</a> )
6	Heater hose
7	Refrigerant line (See <a href="#">REFRIGERANT LINE REMOVAL/INSTALLATION.</a> )

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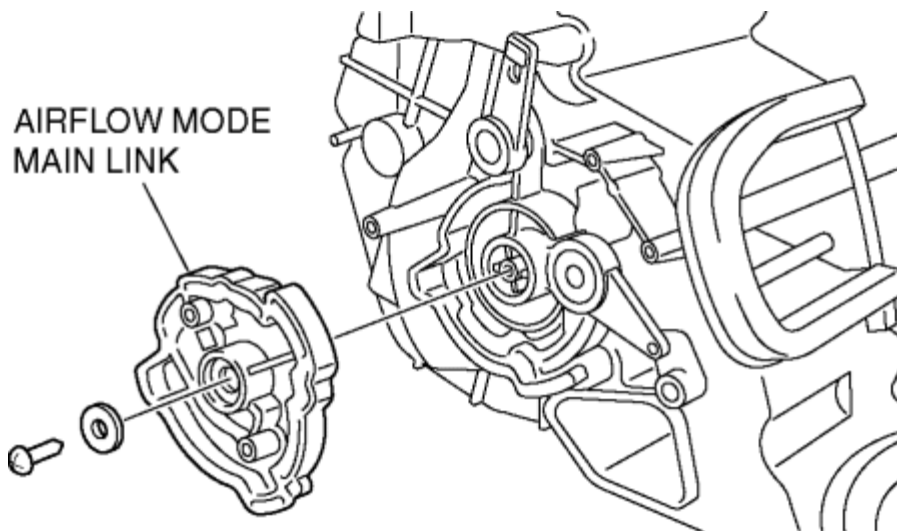
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## 2008 - MX-5 - HVAC

### AIRFLOW MODE MAIN LINK REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the airflow mode actuator. (See [AIRFLOW MODE ACTUATOR REMOVAL/INSTALLATION.](#))
4. Remove the airflow mode main link as shown in the figure.



5. Install in the reverse order of removal.

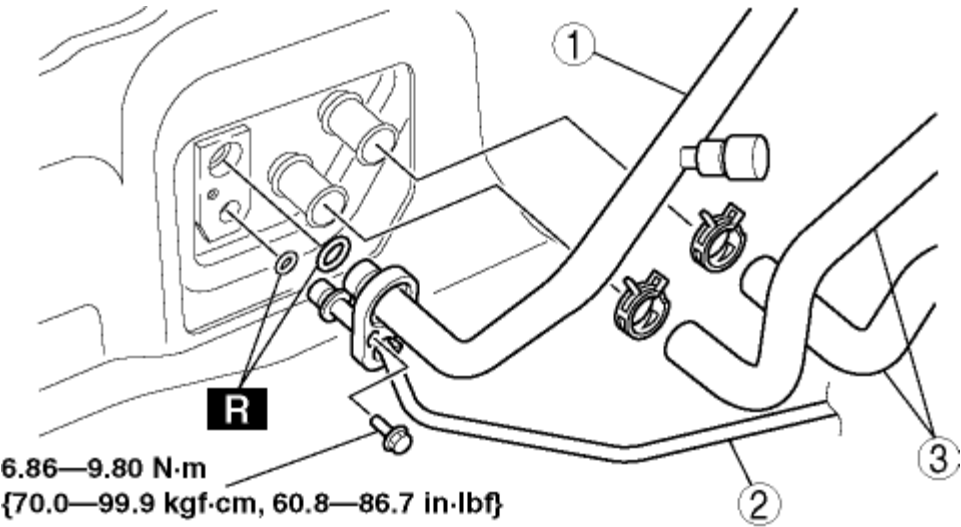
2008 - MX-5 - HVAC

AIR DIST UNIT REMOVAL/INSTALLATION

- 1. Remove the battery cover.
- 2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
- 3. Discharge the refrigerant from the system. (See [REFRIGERANT RECOVERY.](#)) (See [REFRIGERANT CHARGING.](#))
- 4. Drain the engine coolant. (See [ENGINE COOLANT REPLACEMENT \[LF\].](#))
- 5. Disconnect from A/C unit in the order in the table.

CAUTION:

- If moisture or foreign material enters the refrigeration cycle, cooling ability will be lowered and abnormal noise or other malfunction could occur. Always plug open fittings immediately after removing any refrigeration cycle parts.

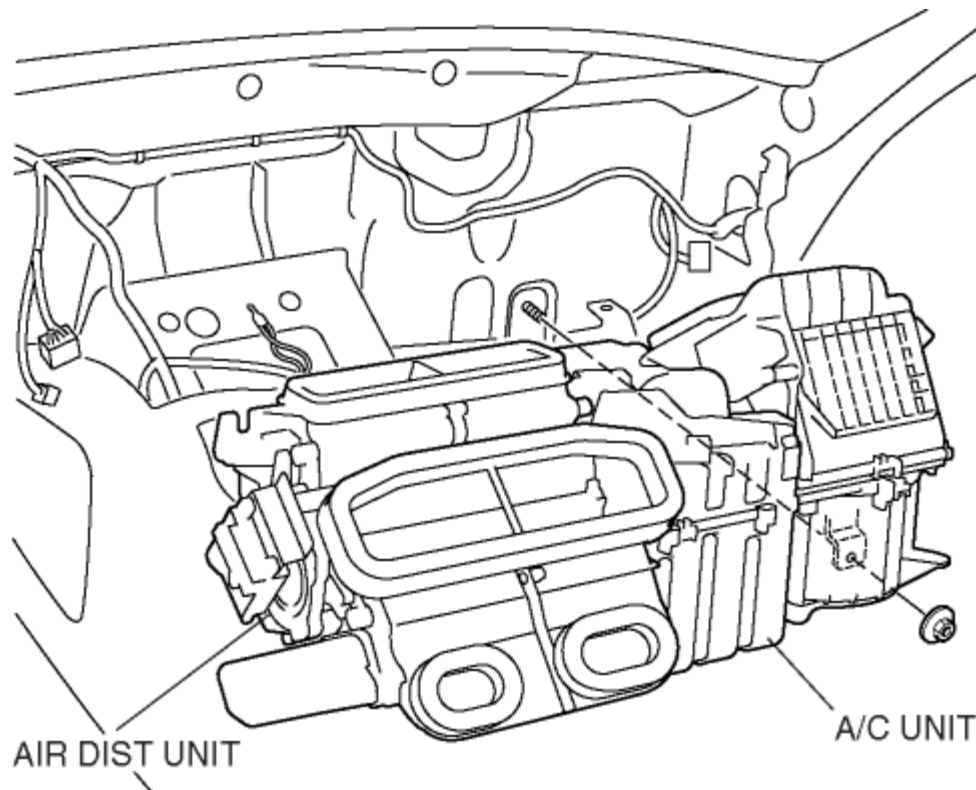


1	Cooler pipe No.3 (LO) (See <a href="#">REFRIGERANT LINE REMOVAL/INSTALLATION.</a> )
2	Cooler pipe No.2 (HI) (See <a href="#">REFRIGERANT LINE REMOVAL/INSTALLATION.</a> )
3	Heater hose

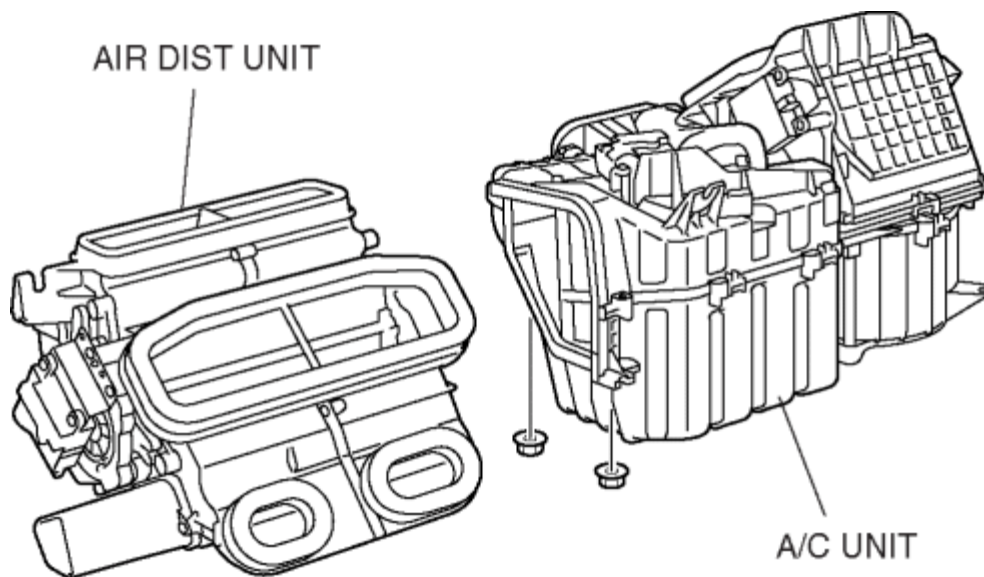
6. Remove the following parts:

- a. Console (See [CONSOLE REMOVAL/INSTALLATION.](#))
- b. Glove compartment (See [GLOVE COMPARTMENT REMOVAL/INSTALLATION.](#))
- c. Side wall (See [SIDE WALL REMOVAL/INSTALLATION.](#))
- d. Console panel (See [CONSOLE PANEL REMOVAL/INSTALLATION.](#))
- e. Center panel unit (See [CENTER PANEL UNIT REMOVAL/INSTALLATION.](#))
- f. Lower panel (See [LOWER PANEL REMOVAL/INSTALLATION.](#))
- g. Knee bolster
- h. Column cover (See [COLUMN COVER REMOVAL/INSTALLATION.](#))
- i. Driver-side air bag module (See [DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.](#))
- j. Steering wheel (See [STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.](#))
- k. Combination switch (See [COMBINATION SWITCH REMOVAL/INSTALLATION.](#))
- l. Steering shaft (See [STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.](#))
- m. Meter hood (See [METER HOOD REMOVAL/INSTALLATION.](#))
- n. Instrument cluster (See [INSTRUMENT CLUSTER REMOVAL/INSTALLATION.](#))
- o. Side panel (See [SIDE PANEL REMOVAL/INSTALLATION.](#))
- p. Hood release lever (See [HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION \[ADVANCED KEYLESS SYSTEM\].](#))
- q. Female bracket (See [CONVERTIBLE TOP DISASSEMBLY/ASSEMBLY.](#))
- r. A-pillar trim (See [A-PILLAR TRIM REMOVAL/INSTALLATION.](#))
- s. Scuff plate (See [SCUFF PLATE REMOVAL/INSTALLATION.](#))
- t. Front side trim (See [FRONT SIDE TRIM REMOVAL/INSTALLATION.](#))
- u. Fuse box No.1
- v. Dashboard (See [DASHBOARD REMOVAL/INSTALLATION.](#))

7. Remove the air dist unit and A/C unit.



8. Disassemble the air dist unit as shown in the figure.



9. Install in the reverse order of removal.

10. Perform the refrigerant system performance test. (See [REFRIGERANT SYSTEM PERFORMANCE TEST](#).)

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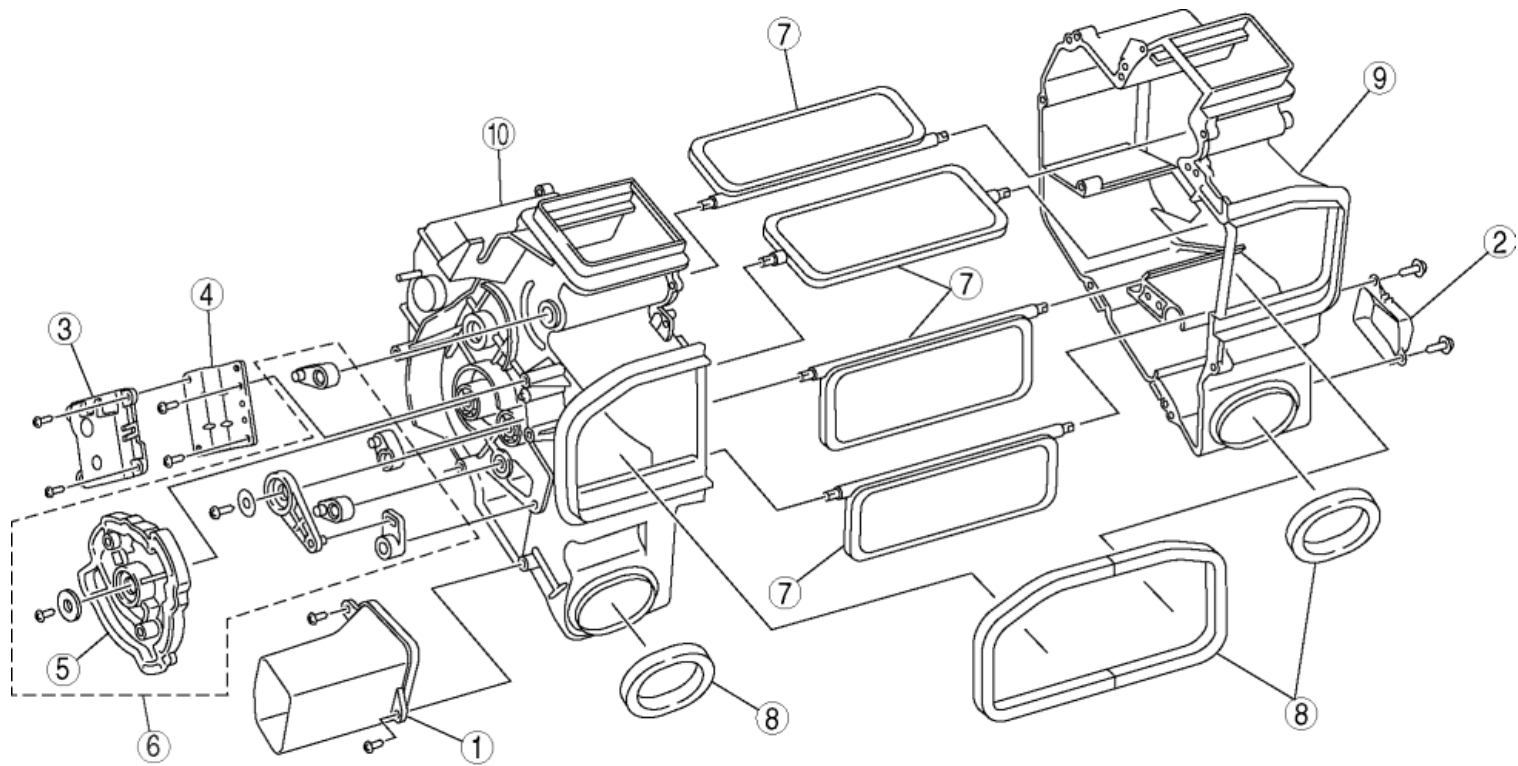
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AIR DIST UNIT DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.

CAUTION:

- If a non-specified grease is used, it may result in abnormal noise or improper operation of the links. Apply only the specified grease to each link.



1	Duct (1)
2	Duct (2)
3	Airflow mode actuator
4	Bracket
5	Airflow mode main link
6	Airflow mode link set
7	Airflow mode door
8	Polyurethane form
9	Case (1)
10	Case (2)

2. Assemble in the reverse order of disassembly.

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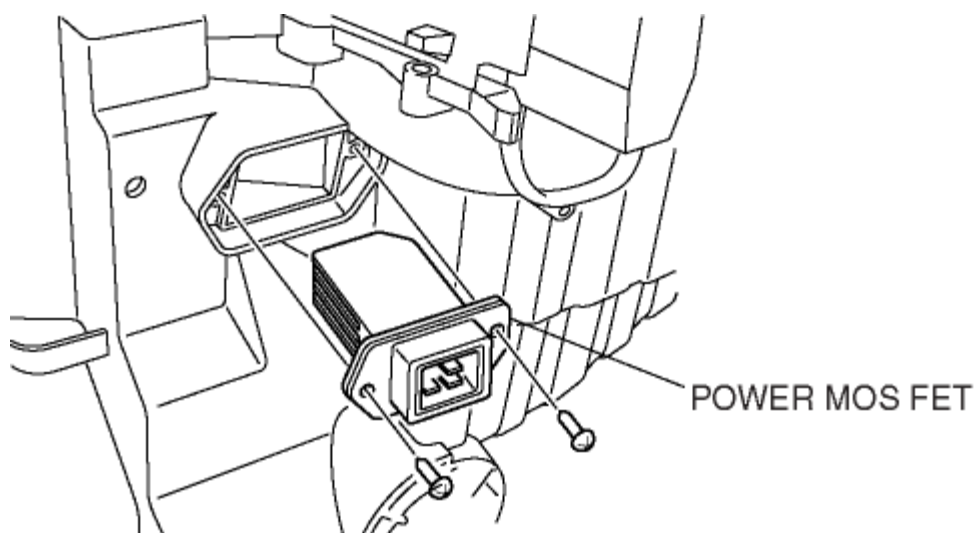
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## 2008 - MX-5 - HVAC

### POWER METAL OXIDE SEMICONDUCTOR FIELD EFFECT TRANSISTOR (POWER MOS FET) REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Disconnect the power MOS FET connector.
4. Remove the power MOS FET as shown in the figure.



5. Install in the reverse order of removal.
6. Perform the refrigerant system performance test. (See [REFRIGERANT SYSTEM PERFORMANCE TEST](#).)

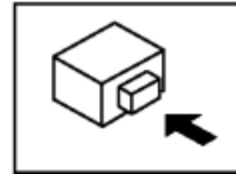
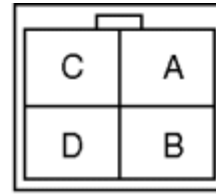
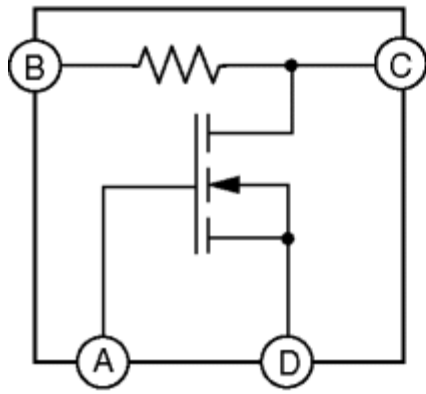
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POWER METAL OXIDE SEMICONDUCTOR FIELD EFFECT TRANSISTOR (POWER MOS FET) INSPECTION

1. Verify that the resistance between the terminals of the power MOS FET is as shown in the table.
- If there is any malfunction, replace the power MOS FET.

Tester lead		Resistance (kilohm) (approx. quantity)
+	–	
A	B	1,300
A	C	1,300
A	D	2.2
B	A	∞
B	C	0.12
B	D	∞
C	A	∞
C	B	0.12
C	D	∞
D	A	2.2
D	B	190
D	C	1,300





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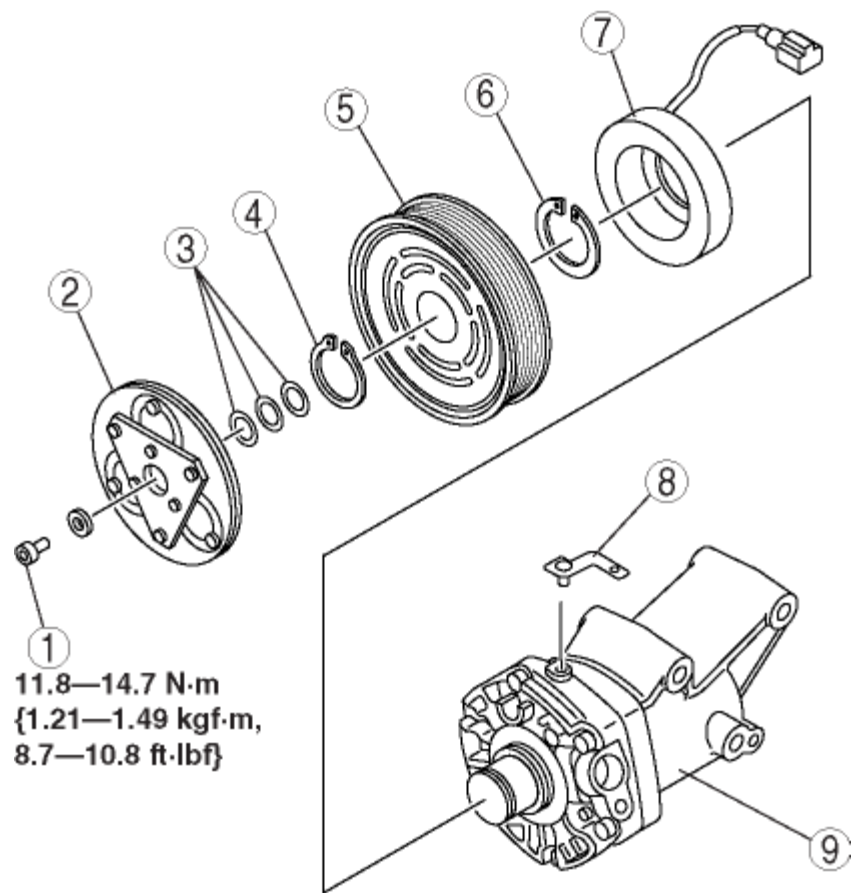
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MAGNETIC CLUTCH DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.



11.8—14.7 N·m  
{1.21—1.49 kgf·m,  
8.7—10.8 ft·lb}

1	Bolt (See Bolt Removal/Installation Note.)
2	Pressure plate
3	Shim (See Shim Installation Note.)
4	Snap ring (See Snap Ring Removal/Installation Note.)

5	A/C compressor pulley (See <a href="#">A/C Compressor Pulley Removal Note.</a> ) (See <a href="#">A/C Compressor Pulley Installation Note.</a> )
6	Snap ring (See <a href="#">Snap Ring Removal/Installation Note.</a> )
7	Stator (See <a href="#">Stator Installation Note.</a> )
8	Clamp
9	A/C compressor body

2. Assemble in the reverse order of disassembly.

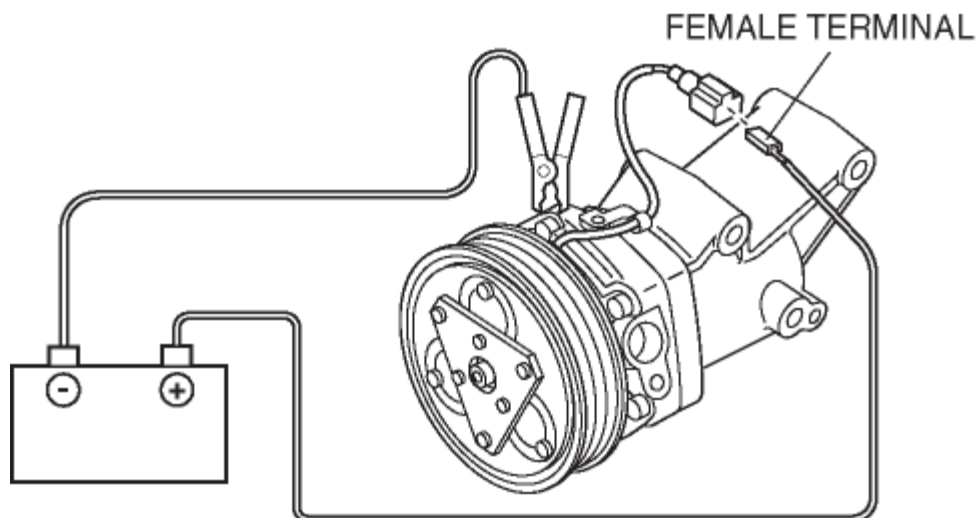
3. Adjust the magnetic clutch clearance. (See [MAGNETIC CLUTCH ADJUSTMENT.](#))

### Bolt Removal/Installation Note

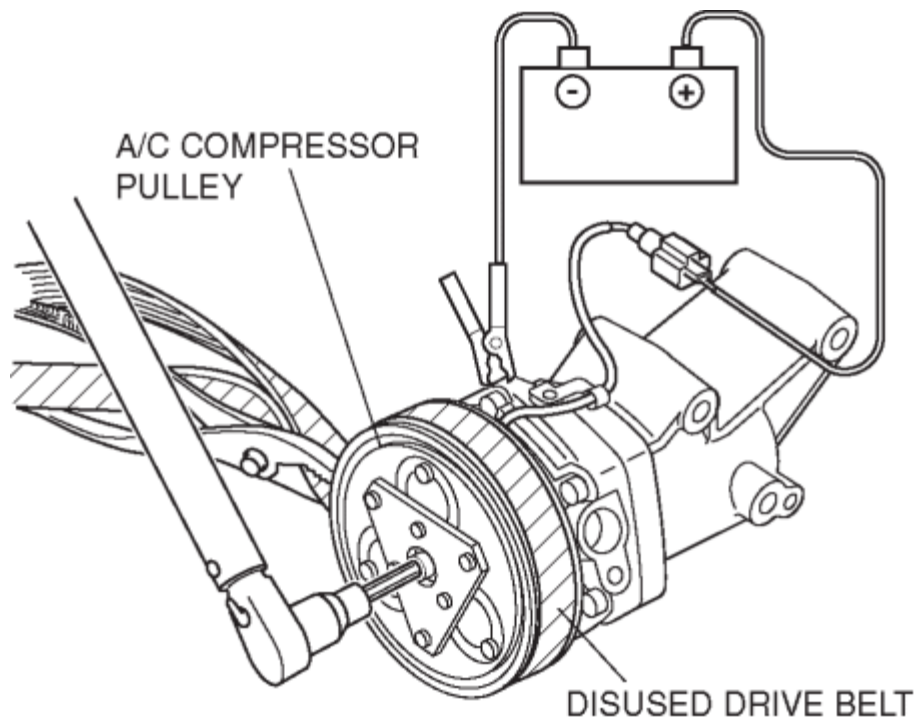
1. When removing or installing the bolt, lock the A/C compressor pulley against rotation using the following procedure.

#### CAUTION:

- When connecting the positive battery cable to the magnetic clutch connector, use a cable with a female terminal of the correct size. Otherwise, load will be applied to the male terminal, resulting in deformation or damage, and poor contact. In addition, the positive battery cable could disconnect from the connector resulting in a short circuit.
- a. Apply battery positive voltage to the magnetic clutch terminal and connect the A/C compressor body to the ground.



b. Wrap the drive belt, which is no longer of use, tightly around the A/C compressor pulley.



c. Hold the drive belt in place with pliers.

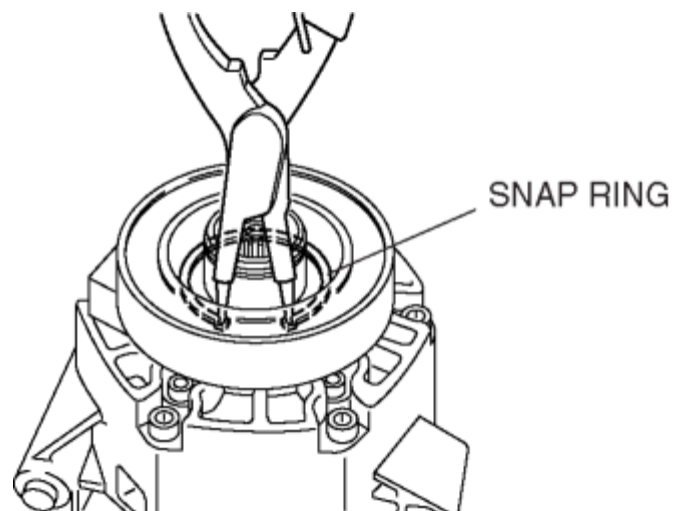
d. Remove or install the bolt.

#### **Tightening torque**

- 11.8—14.7 N·m {1.21—1.49 kgf·m, 8.7—10.8 ft·lbf}

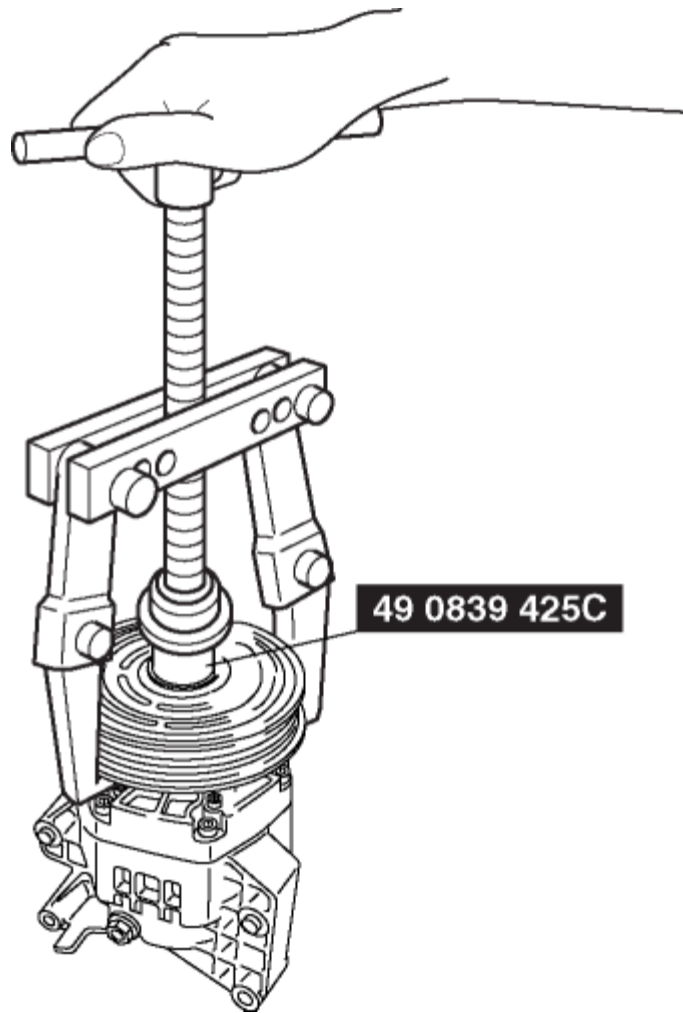
#### **Snap Ring Removal/Installation Note**

1. Remove the snap ring using a snap ring pliers.



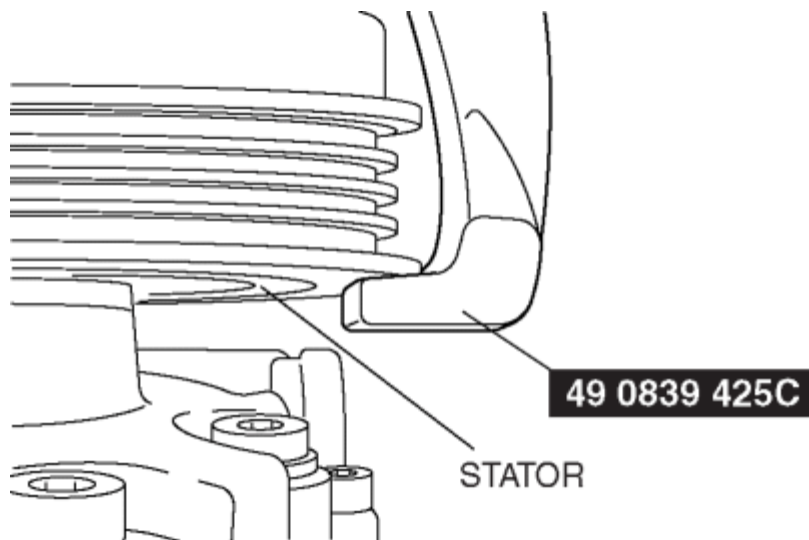
#### **A/C Compressor Pulley Removal Note**

1. Remove the A/C compressor pulley using the **SST (49 0839 425C)**.



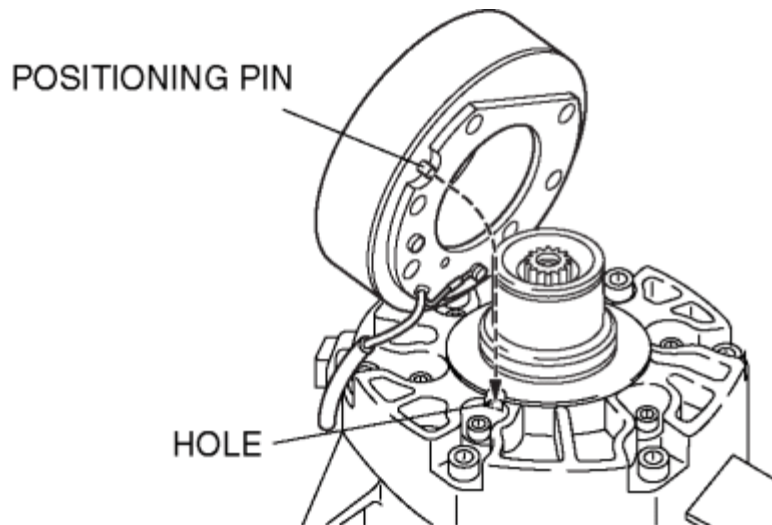
**CAUTION:**

- Be careful that the SST (49 0839 425C) tabs do not hang over the stator.



**Stator Installation Note**

1. Align the positioning pin with the hole of A/C compressor body and insert.

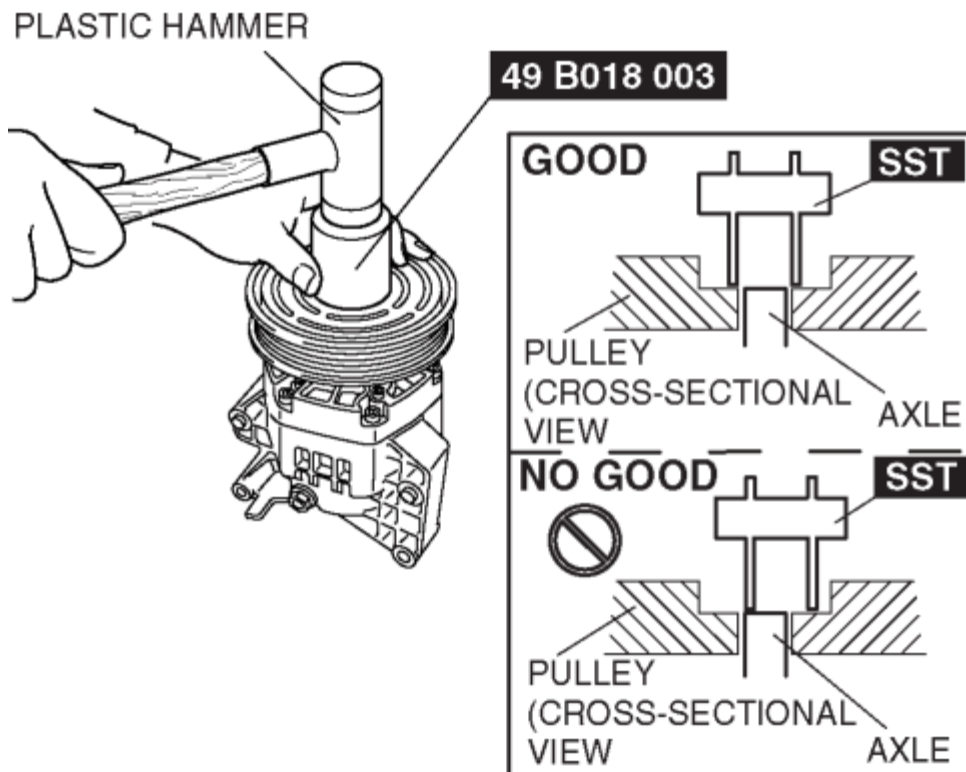


### A/C Compressor Pulley Installation Note

1. Install the inner wheel of the pulley using a plastic hammer and **SST (49 B018 003)** to the compressor.

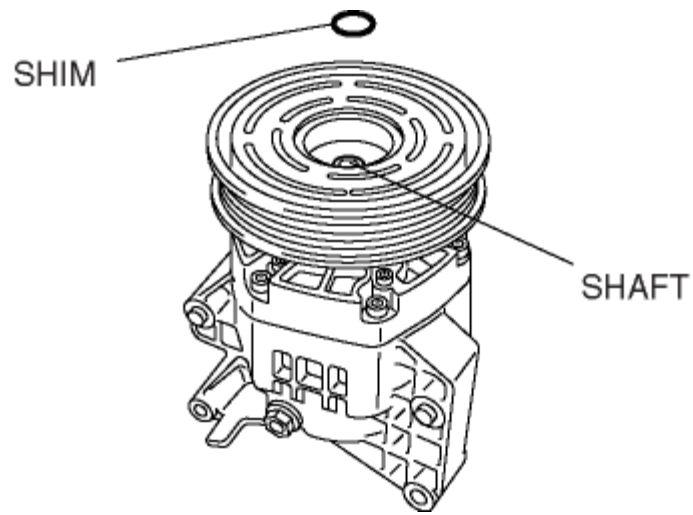
#### CAUTION:

- If the SST is not properly positioned when the A/C compressor pulley is press-fit, the A/C compressor axle will interfere with the SST, possibly damaging component parts. Verify that the SST and axle are properly positioned and perform the procedure very carefully.



### Shim Installation Note

1. First, insert the **1 mm (0.039 in)** thick shim into the shaft.



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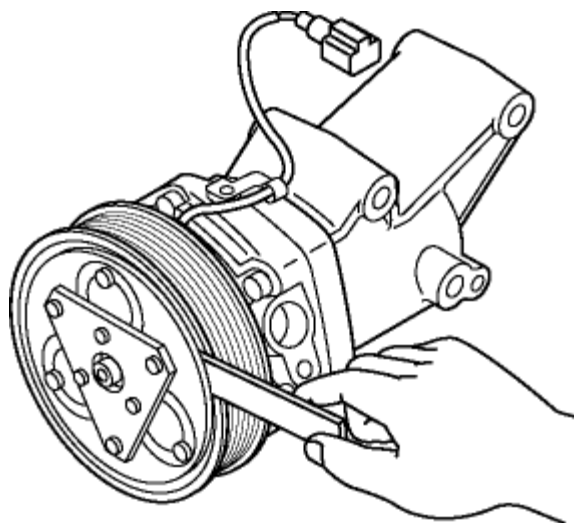
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## 2008 - MX-5 - HVAC

### MAGNETIC CLUTCH ADJUSTMENT

1. Measure the clearance around the entire circumference between the pressure plate and A/C compressor pulley using a thickness gauge.



2. Inspect the clearance.
  - If not within the specification, adjust the clearance by changing the shim or the number of shims.

#### **Magnetic clutch clearance**

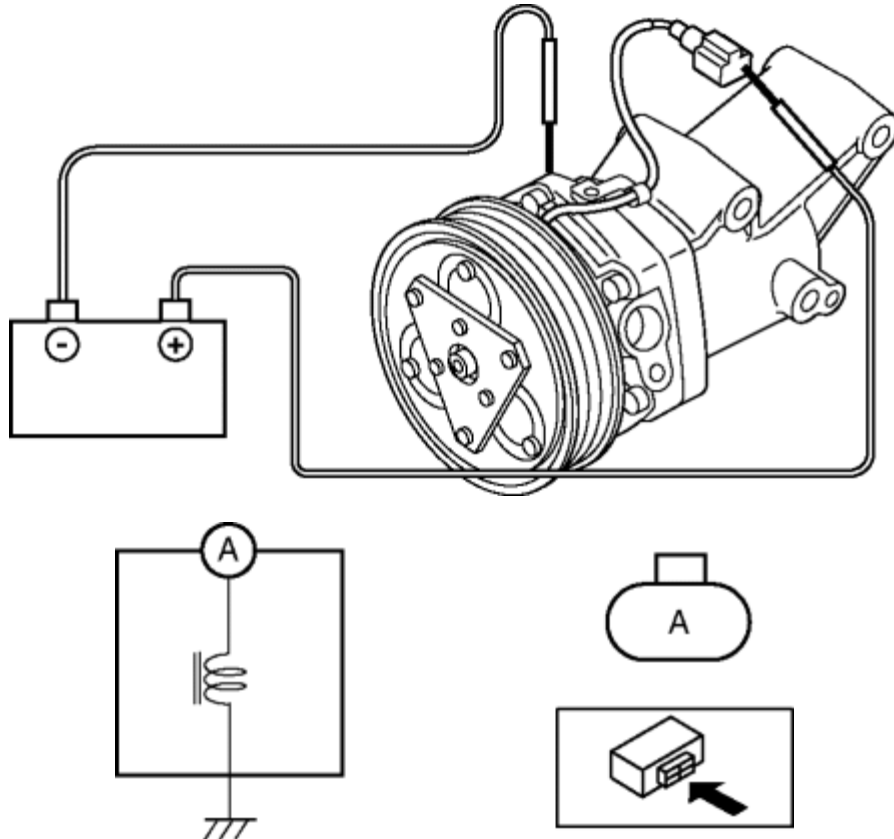
- 0.3—0.6 mm {0.012—0.023 in}



## 2008 - MX-5 - HVAC

### MAGNETIC CLUTCH INSPECTION

1. Connect battery positive voltage to magnetic clutch terminal A and ground.

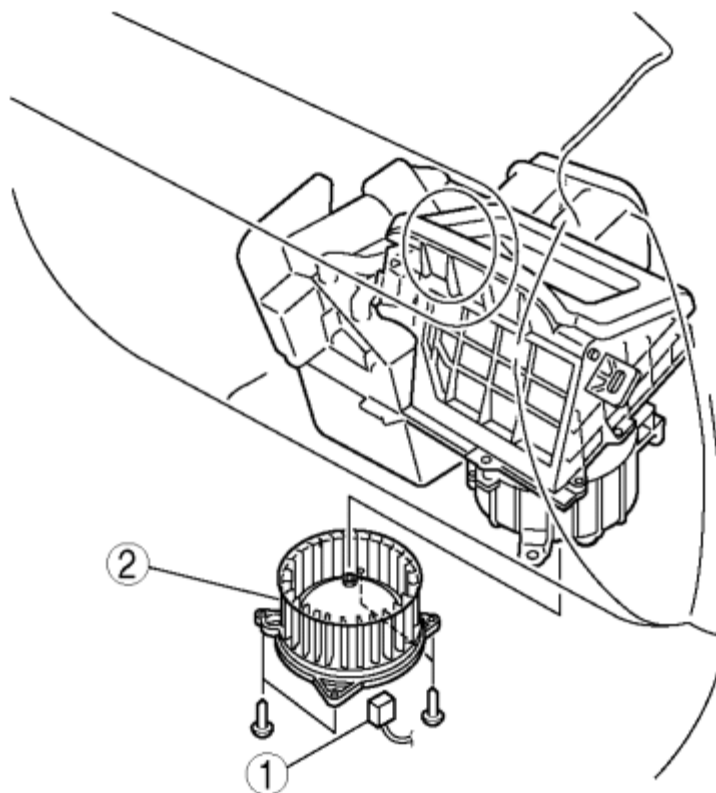


2. Verify that the magnetic clutch turns on.
  - If the magnetic clutch does not turn on, replace the A/C compressor.

## 2008 - MX-5 - HVAC

### BLOWER MOTOR REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove in the order indicated in the table.



1	Blower motor connector
2	Blower motor

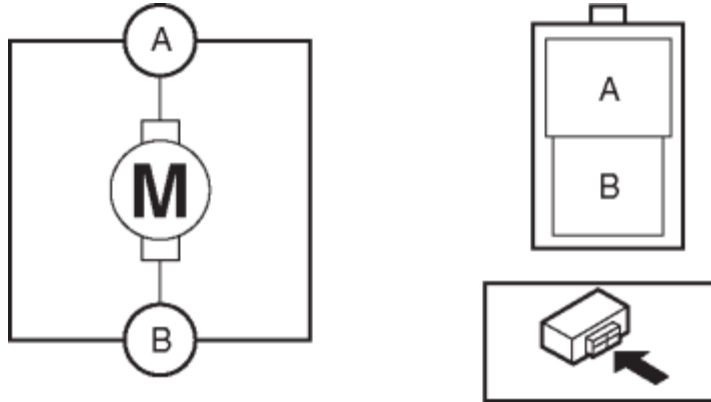
4. Install in the reverse order of removal.

## 2008 - MX-5 - HVAC

### BLOWER MOTOR INSPECTION

1. Connect battery positive voltage to blower motor terminal A, ground to terminal B, and then verify that the blower motor operates smoothly.

- If the operation condition is not normal, replace the blower motor.



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## 2008 - MX-5 - HVAC

### EVAPORATOR TEMPERATURE SENSOR REMOVAL/INSTALLATION

1. Remove the evaporator temperature sensor from the A/C unit. (See [A/C UNIT DISASSEMBLY/ASSEMBLY](#).)

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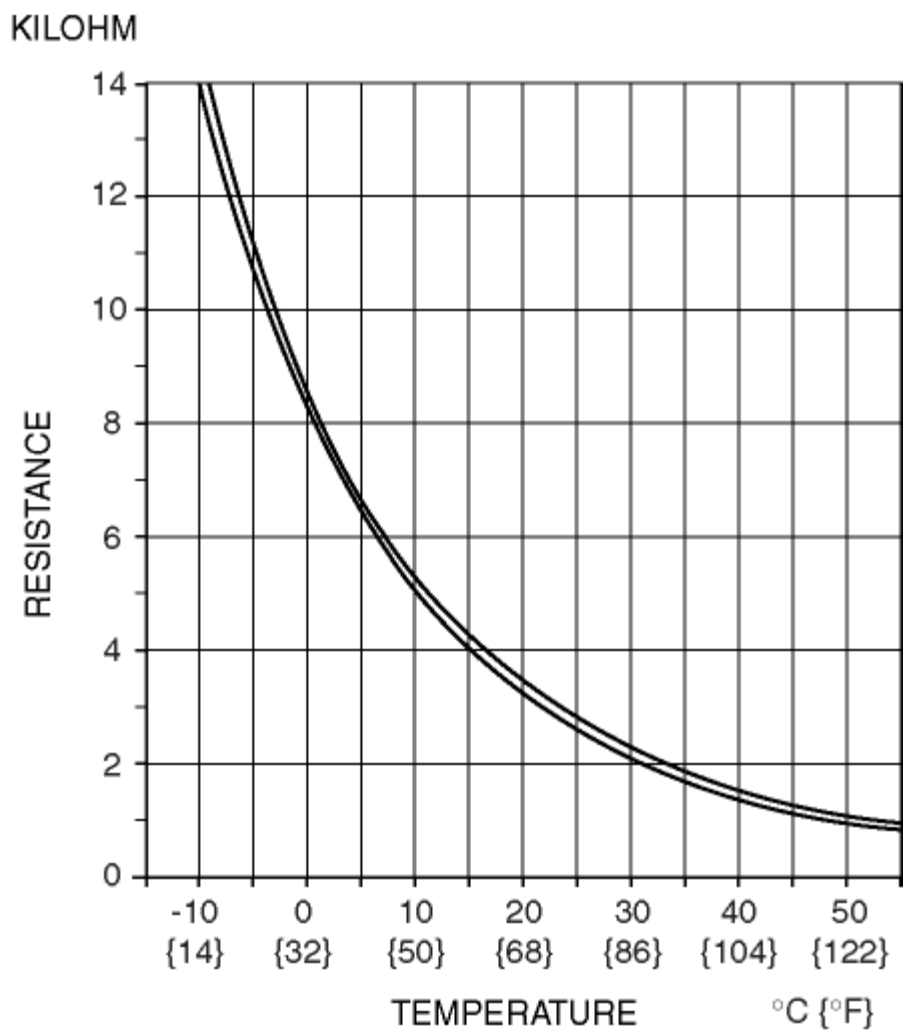
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## 2008 - MX-5 - HVAC

### EVAPORATOR TEMPERATURE SENSOR INSPECTION

#### NOTE:

- Inspect the evaporator temperature sensor when it is installed to the A/C unit.
1. Set the fan speed MAX-HI.
  2. Set the temperature control to MAX COLD.
  3. Set the air intake mode to RECIRCULATE.
  4. Turn the A/C switch off.
  5. Close all of the doors and roll up all the windows.
  6. Wait for **5 min**.
  7. Disconnect the evaporator temperature sensor connector.
  8. Measure the temperature at the air intake.
  9. Measure the resistance between evaporator temperature sensor terminals.
    - If the characteristics of the evaporator temperature sensor are not as shown in the graph, replace the evaporator temperature sensor.



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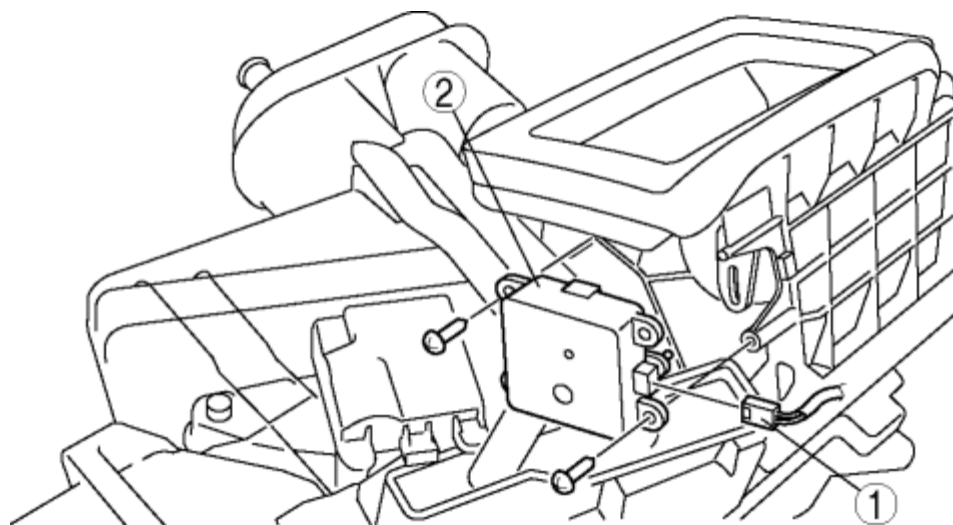
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## 2008 - MX-5 - HVAC

### AIR INTAKE ACTUATOR REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the following parts:
  - a. Console (See [CONSOLE REMOVAL/INSTALLATION.](#))
  - b. Glove compartment (See [GLOVE COMPARTMENT REMOVAL/INSTALLATION.](#))
  - c. Side wall (See [SIDE WALL REMOVAL/INSTALLATION.](#))
  - d. Console panel (See [CONSOLE PANEL REMOVAL/INSTALLATION.](#))
  - e. Center panel unit (See [CENTER PANEL UNIT REMOVAL/INSTALLATION.](#))
  - f. Lower panel (See [LOWER PANEL REMOVAL/INSTALLATION.](#))
  - g. Knee bolster
  - h. Column cover (See [COLUMN COVER REMOVAL/INSTALLATION.](#))
  - i. Driver-side air bag module (See [DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.](#))
  - j. Steering wheel (See [STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.](#))
  - k. Combination switch (See [COMBINATION SWITCH REMOVAL/INSTALLATION.](#))
  - l. Steering shaft (See [STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.](#))
  - m. Meter hood (See [METER HOOD REMOVAL/INSTALLATION.](#))
  - n. Instrument cluster (See [INSTRUMENT CLUSTER REMOVAL/INSTALLATION.](#))
  - o. Side panel (See [SIDE PANEL REMOVAL/INSTALLATION.](#))
  - p. Hood release lever (See [HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION \[ADVANCED KEYLESS SYSTEM\].](#))
  - q. Female bracket (See [CONVERTIBLE TOP DISASSEMBLY/ASSEMBLY.](#))
  - r. A-pillar trim (See [A-PILLAR TRIM REMOVAL/INSTALLATION.](#))
  - s. Scuff plate (See [SCUFF PLATE REMOVAL/INSTALLATION.](#))
  - t. Front side trim (See [FRONT SIDE TRIM REMOVAL/INSTALLATION.](#))
  - u. Fuse box No.1
  - v. Dashboard (See [DASHBOARD REMOVAL/INSTALLATION.](#))
4. Remove in the order indicated in the table.



1	Air intake actuator connector
---	-------------------------------

2	Air intake actuator
---	---------------------

5. Install in the reverse order of removal.

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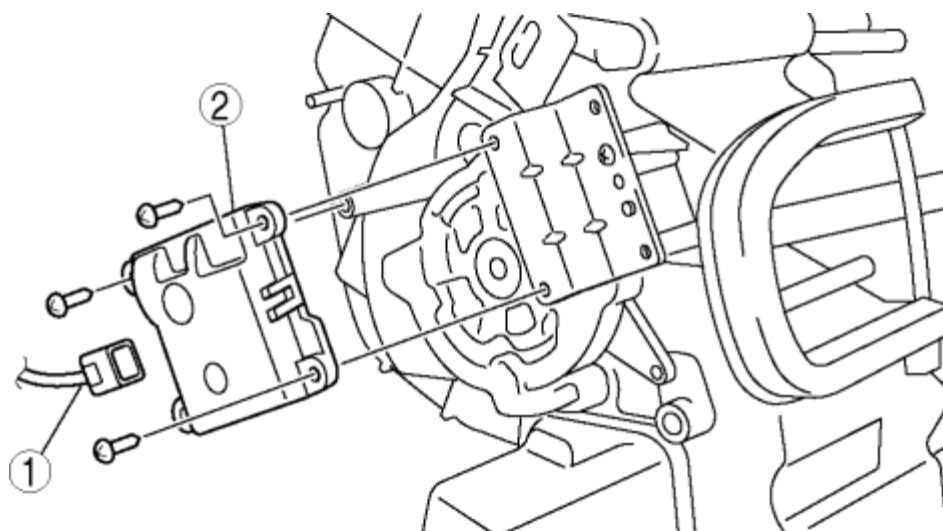
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## 2008 - MX-5 - HVAC

### AIRFLOW MODE ACTUATOR REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the following parts:
  1. Lower panel (See [LOWER PANEL REMOVAL/INSTALLATION.](#))
  2. Knee bolster
4. Remove in the order indicated in the table.



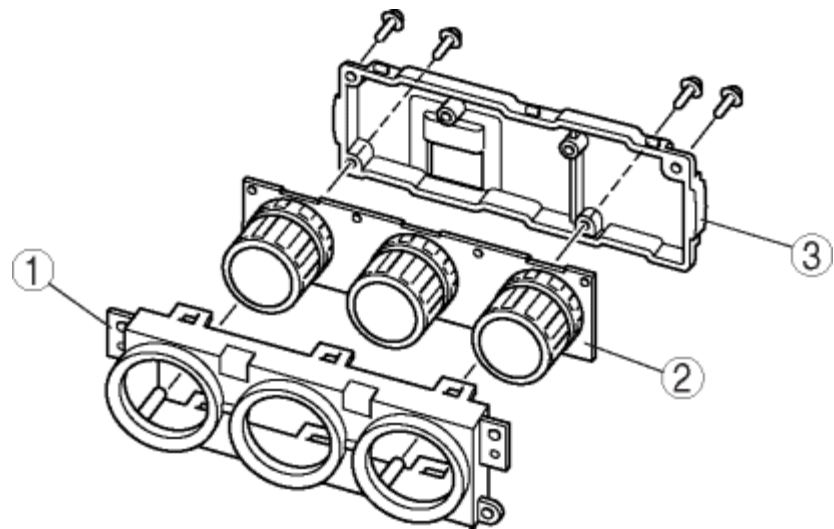
1	Airflow mode actuator connector
2	Airflow mode actuator

5. Install in the reverse order of removal.

2008 - MX-5 - HVAC

CLIMATE CONTROL UNIT DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.



1	Case (1)
2	Panel
3	Case (2)

2. Assemble in the reverse order of disassembly.

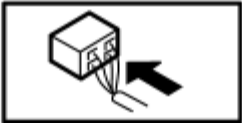
2008 - MX-5 - HVAC

CLIMATE CONTROL UNIT INSPECTION

1. Turn the ignition switch to the ON position.
2. Connect the negative (-) lead of the tester to body ground.
3. By inserting the positive (+) lead of the tester into each climate control unit terminal, measure the voltage according to the terminal voltage table.

• If there is any malfunction, inspect the parts under "Inspection item (s)".

▪ If the parts under "Inspection item (s)" are found to be normal, replace the climate control unit.
- Terminal Voltage Table (Reference)
- |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|
| S | Q | O | M | K | I | G | E | C | A |
| T | R | P | N | L | J | H | F | D | B |

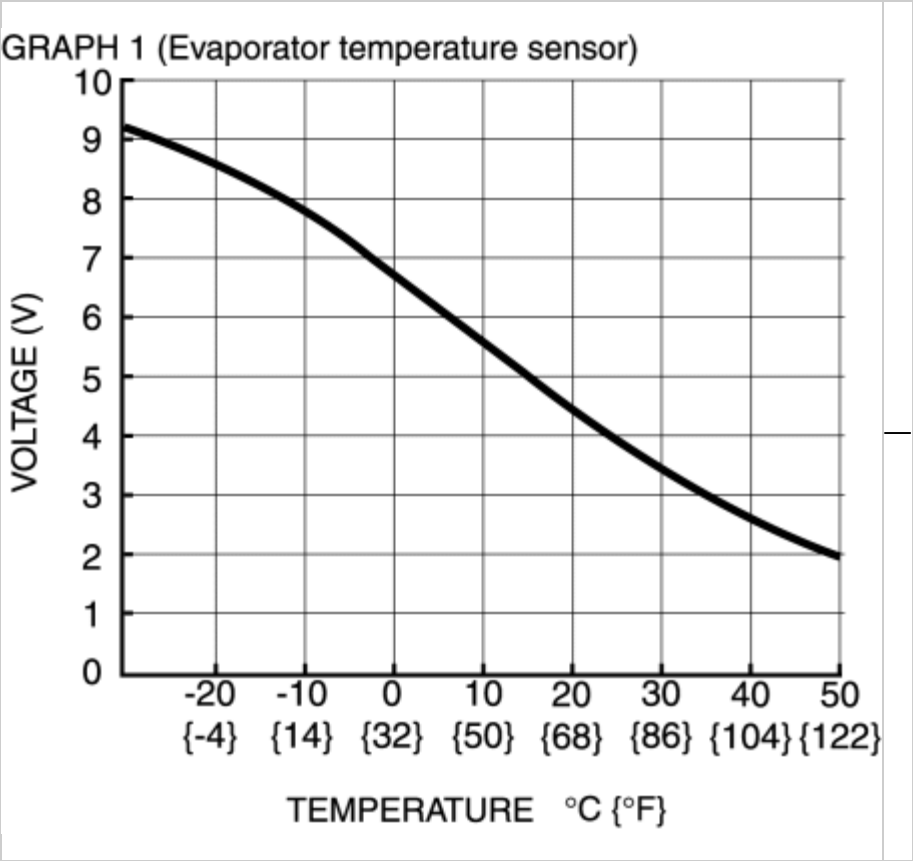

- | Terminal | Signal name | Connected to   | Measurement condition | Voltage (V) | Inspection item (s)  |
|----------|-------------|----------------|-----------------------|-------------|--|
| A        | IG2         | A/C 7.5 A fuse | IG SW ON              | B+          | <div><div>• Wiring harness: continuity, short circuit (Climate control unit— fuse: A—A/C 7.5 A)</div><div>• A/C 7.5 A fuse</div></div> |
|          |             |                | IG SW LOCK            | 1.0 or less | <div><div>• Wiring harness: continuity, short circuit (Climate control unit— fuse: A—A/C 7.5 A)</div></div>                            |

B	B+	ROOM 15 A fuse	Under any condition	B+	<ul style="list-style-type: none"><li>Wiring harness: continuity, short circuit (Climate control unit—fuse: B—ROOM 15 A)</li><li>ROOM 15 A fuse</li></ul>
C	Blower fan speed control	Power MOS FET	Fan stopped	1.0 or less	<ul style="list-style-type: none"><li>Wiring harness: continuity, short circuit (Climate control unit—power MOS FET: C—C)</li><li>Power MOS FET</li></ul>
			Fan: manual 1 (LO) — 24	2.7—3.4	
			Fan: manual 25 (HI)	9.6	
D	TNS signal	TNS relay	Headlight switch OFF	1.0 or less	<ul style="list-style-type: none"><li>Wiring harness: short circuit (Climate control unit—TNS relay: D—D)</li><li>TNS relay</li><li>Headlight switch</li></ul>
			Headlight switch ON	B+	<ul style="list-style-type: none"><li>Wiring harness: continuity, short circuit (Climate control unit—TNS relay: D—D)</li><li>TNS relay</li><li>Headlight switch</li></ul>
E	Blower motor feedback	Power MOS FET	Fan stopped	B+	<ol style="list-style-type: none"><li>Wiring harness: continuity, short circuit (Climate control unit—power MOS FET: E—B)</li><li>Power MOS FET</li><li>Blower motor</li><li>Blower relay</li><li>HEATER 40 A fuse</li><li>Power MOS FET replacement</li></ol>
			Fan: manual LO	8.17	
			Fan: manual HI	0.6	

F	Panel control signal	Instrument cluster	Headlight switch OFF	0	<ul style="list-style-type: none"><li>Wiring harness: continuity (Climate control unit—instrument cluster: F—1F)</li><li>Instrument cluster</li><li>Climate control unit: terminal voltage (D)</li></ul>
			Headlight switch ON	2.7	<ul style="list-style-type: none"><li>Wiring harness: short circuit (Climate control unit—instrument cluster: F—1F)</li></ul>
G	Actuator power	<ul style="list-style-type: none"><li>Air intake actuator</li><li>Air mix actuator</li><li>Airflow mode actuator</li></ul>	IG SW ON	B+	<ul style="list-style-type: none"><li>Wiring harness: continuity, short circuit (Climate control unit— air intake actuator, air mix actuator, air flow mode actuator: G—A, A, A)</li><li>Air intake actuator</li><li>Air mix actuator</li><li>Airflow mode actuator</li></ul>
			IG SW LOCK	1.0 or less	
H	GND	Body ground	Under any condition	1.0 or less	<ul style="list-style-type: none"><li>Wiring harness: continuity (Climate control unit—GND: H—GND)</li></ul>
I	Plus Signal	—	—	—	—
J	—	—	—	—	—
			A/C switch ON, fan switch at 1st	1.0 or less	<ul style="list-style-type: none"><li>Wiring harness: short circuit (Climate control unit—refrigerant pressure switch: K—A)</li></ul>
					<ul style="list-style-type: none"><li>Wiring harness:</li></ul>

K	A/C	Refrigerant pressure switch	A/C switch OFF	B+	continuity, short circuit (Climate control unit—refrigerant pressure switch: K—A) (Refrigerant pressure switch—PCM: C—1J) <ul style="list-style-type: none"> <li>Refrigerant pressure switch</li> <li>PCM: terminal voltage (1J)</li> </ul>
L	—	—	—	—	—
M	Evaporator temperature sensor input	Evaporator temperature sensor	Compared with temperature detected by evaporator temperature sensor	Refer to graph 1	<ul style="list-style-type: none"> <li>Wiring harness: continuity (Climate control unit—evaporator temperature sensor: M—B, S—A)</li> <li>Wiring harness: short circuit (Climate control unit—evaporator temperature sensor: M—B)</li> <li>Evaporator temperature sensor</li> </ul>
N	Rear window defroster operation	Rear window defroster relay	Rear window defroster switch OFF	B+	<ul style="list-style-type: none"> <li>Wiring harness: continuity, short circuit (Climate control unit—rear window defroster relay: N—E)</li> <li>Rear window defroster relay</li> </ul>
			Rear window defroster switch ON	1.0 or less	
O	—	—	—	—	—
P	—	—	—	—	—
Q	—	—	—	—	—
R	—	—	—	—	—

S	Sensor GND	Evaporator temperature sensor	Under any condition	1.0 or less	<ul style="list-style-type: none"> <li>Wiring harness: continuity (Climate control unit—GND: S—GND)</li> </ul>
T	—	—	—	—	—

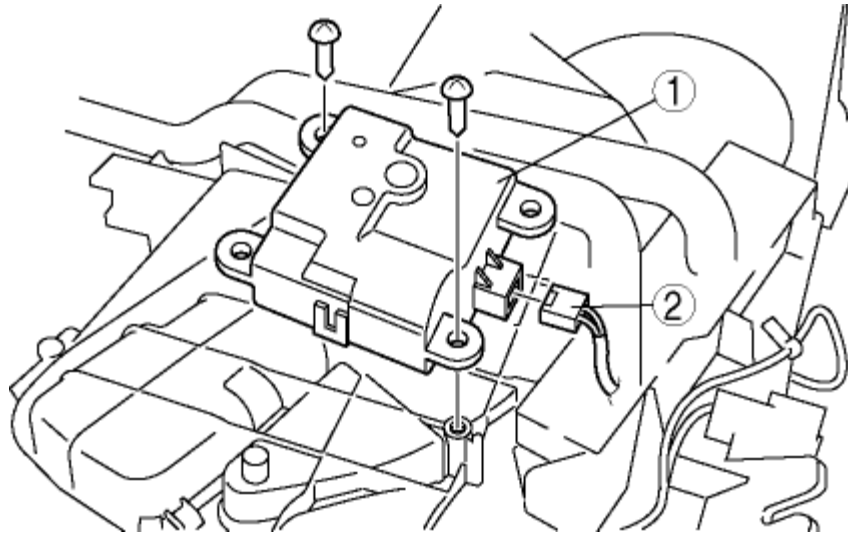


## 2008 - MX-5 - HVAC

### AIR MIX ACTUATOR REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the following parts:
  - a. Console (See [CONSOLE REMOVAL/INSTALLATION.](#))
  - b. Glove compartment (See [GLOVE COMPARTMENT REMOVAL/INSTALLATION.](#))
  - c. Side wall (See [SIDE WALL REMOVAL/INSTALLATION.](#))
  - d. Console panel (See [CONSOLE PANEL REMOVAL/INSTALLATION.](#))
  - e. Center panel unit (See [CENTER PANEL UNIT REMOVAL/INSTALLATION.](#))
  - f. Lower panel (See [LOWER PANEL REMOVAL/INSTALLATION.](#))
  - g. Knee bolster
  - h. Column cover (See [COLUMN COVER REMOVAL/INSTALLATION.](#))
  - i. Driver-side air bag module (See [DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.](#))
  - j. Steering wheel (See [STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.](#))
  - k. Combination switch (See [COMBINATION SWITCH REMOVAL/INSTALLATION.](#))
  - l. Steering shaft (See [STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.](#))
  - m. Meter hood (See [METER HOOD REMOVAL/INSTALLATION.](#))
  - n. Instrument cluster (See [INSTRUMENT CLUSTER REMOVAL/INSTALLATION.](#))
  - o. Side panel (See [SIDE PANEL REMOVAL/INSTALLATION.](#))
  - p. Hood release lever (See [HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION \[ADVANCED KEYLESS SYSTEM\].](#))
  - q. Female bracket (See [CONVERTIBLE TOP DISASSEMBLY/ASSEMBLY.](#))
  - r. A-pillar trim (See [A-PILLAR TRIM REMOVAL/INSTALLATION.](#))
  - s. Scuff plate (See [SCUFF PLATE REMOVAL/INSTALLATION.](#))
  - t. Front side trim (See [FRONT SIDE TRIM REMOVAL/INSTALLATION.](#))
  - u. Fuse box No.1
  - v. Dashboard (See [DASHBOARD REMOVAL/INSTALLATION.](#))
4. Remove in the order indicated in the table.





1	Air mix actuator
2	Air mix actuator connector

5. Install in the reverse order of removal.

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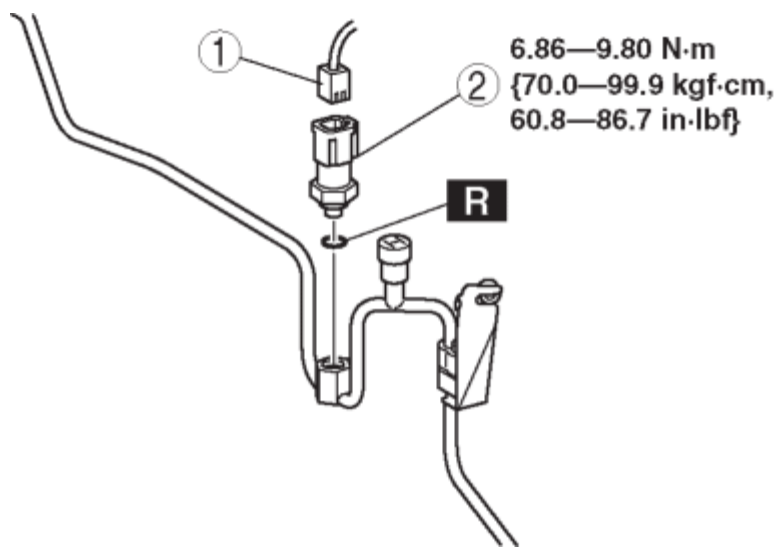
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2008 - MX-5 - HVAC

REFRIGERANT PRESSURE SWITCH REMOVAL/INSTALLATION

- 1. Remove the battery cover.
- 2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
- 3. Discharge the refrigerant from the system. (See [REFRIGERANT CHARGING.](#))
- 4. Remove in the order indicated in the table.



1	Refrigerant pressure switch connector
2	Refrigerant pressure switch (See <a href="#">Refrigerant Pressure Switch Installation Note.</a> )

- 5. Install in the reverse order of removal.

Refrigerant Pressure Switch Installation Note

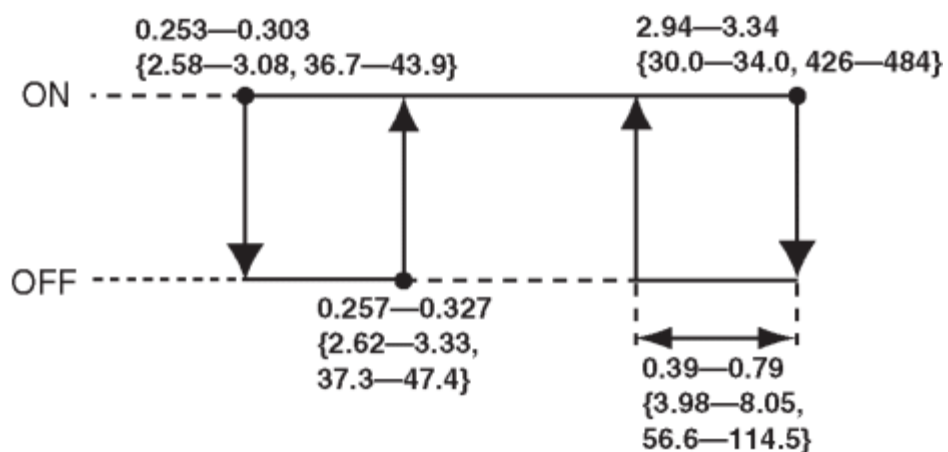
- 1. Apply compressor oil to the O-ring joints.

## 2008 - MX-5 - HVAC

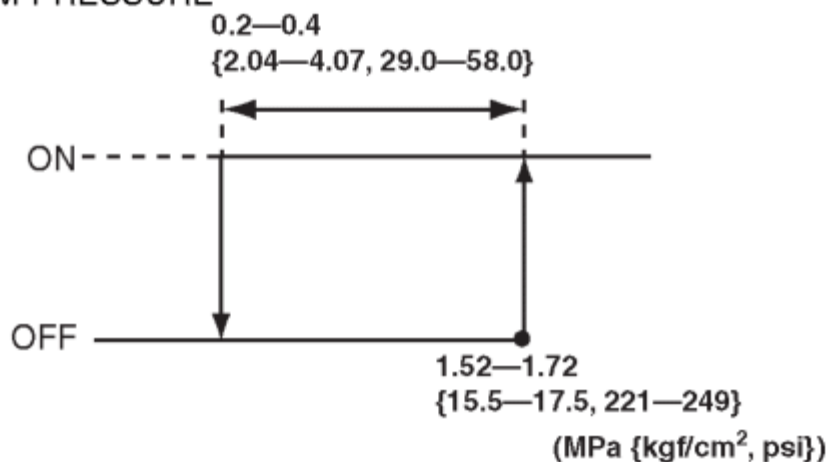
### REFRIGERANT PRESSURE SWITCH INSPECTION

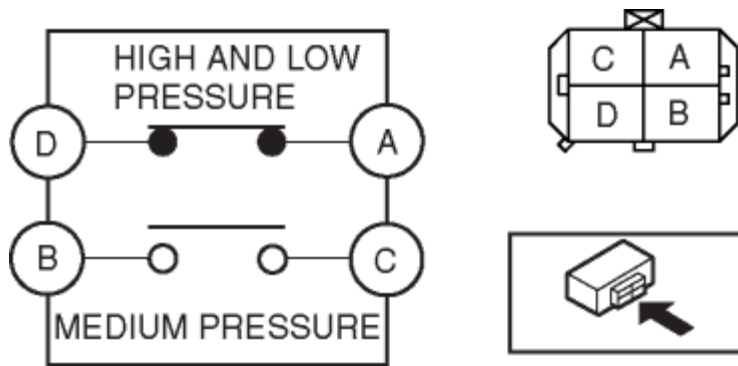
1. Connect the manifold gauge.
2. Verify the high-pressure side reading.
3. Disconnect the refrigerant pressure switch connector.
4. Verify continuity between the terminals of the refrigerant pressure switch.
  - If the continuity is not normal, replace the refrigerant pressure switch.

#### HI AND LO PRESSURE



#### MEDIUM-PRESSURE





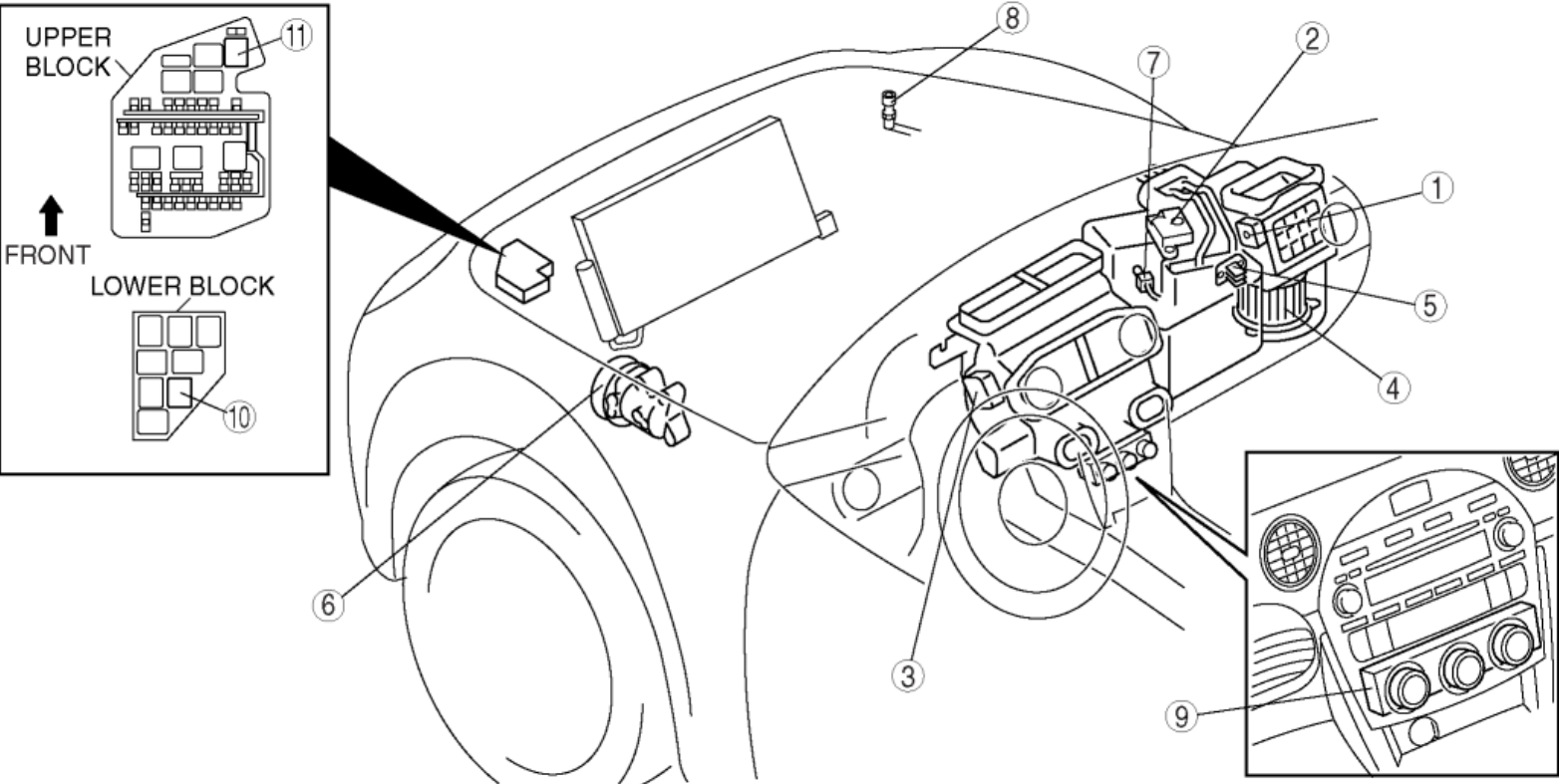
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2008 - MX-5 - HVAC

HVAC CONTROL SYSTEM LOCATION INDEX



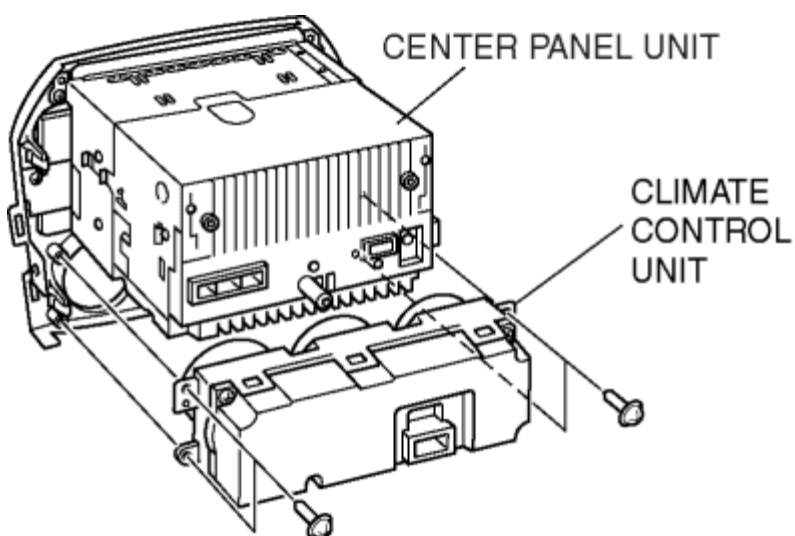
1	Air intake actuator (See <a href="#">AIR INTAKE ACTUATOR REMOVAL/INSTALLATION.</a> )
2	Air mix actuator (See <a href="#">AIR MIX ACTUATOR REMOVAL/INSTALLATION.</a> )
3	Airflow mode actuator (See <a href="#">AIRFLOW MODE ACTUATOR REMOVAL/INSTALLATION.</a> )
4	Blower motor (See <a href="#">BLOWER MOTOR REMOVAL/INSTALLATION.</a> ) (See <a href="#">BLOWER MOTOR INSPECTION.</a> )
5	Power MOS FET (See <a href="#">POWER METAL OXIDE SEMICONDUCTOR FIELD EFFECT TRANSISTOR (POWER MOS FET) REMOVAL/INSTALLATION.</a> ) (See <a href="#">POWER METAL OXIDE SEMICONDUCTOR FIELD EFFECT TRANSISTOR (POWER MOS FET) INSPECTION.</a> )
6	Magnetic clutch (See <a href="#">MAGNETIC CLUTCH DISASSEMBLY/ASSEMBLY.</a> ) (See <a href="#">MAGNETIC CLUTCH ADJUSTMENT.</a> )

	(See <a href="#">MAGNETIC CLUTCH INSPECTION.</a> )
7	Evaporator temperature sensor (See <a href="#">EVAPORATOR TEMPERATURE SENSOR REMOVAL/INSTALLATION.</a> ) (See <a href="#">EVAPORATOR TEMPERATURE SENSOR INSPECTION.</a> )
8	Refrigerant pressure switch (See <a href="#">REFRIGERANT PRESSURE SWITCH REMOVAL/INSTALLATION.</a> ) (See <a href="#">REFRIGERANT PRESSURE SWITCH INSPECTION.</a> )
9	Climate control unit (See <a href="#">CLIMATE CONTROL UNIT REMOVAL/INSTALLATION.</a> ) (See <a href="#">CLIMATE CONTROL UNIT DISASSEMBLY/ASSEMBLY.</a> ) (See <a href="#">CLIMATE CONTROL UNIT INSPECTION.</a> )
10	A/C relay (See <a href="#">RELAY INSPECTION.</a> )
11	Blower relay (See <a href="#">RELAY INSPECTION.</a> )

## 2008 - MX-5 - HVAC

### CLIMATE CONTROL UNIT REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the side wall. (See [SIDE WALL REMOVAL/INSTALLATION.](#))
4. Remove the center panel unit. (See [CENTER PANEL UNIT REMOVAL/INSTALLATION.](#))
5. Remove the climate control unit from the center panel unit.



6. Install in the reverse order of removal.

2008 - MX-5 - HVAC

HVAC TECHNICAL DATA

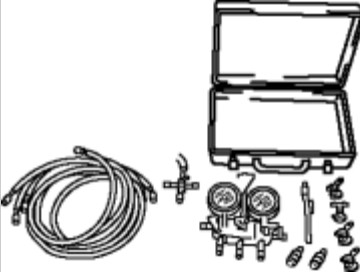
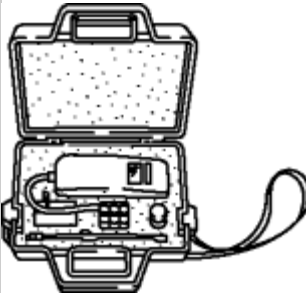
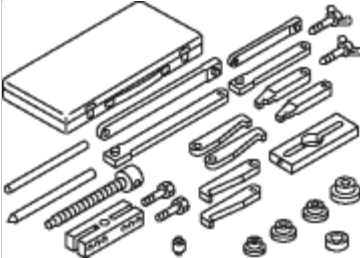
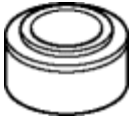
Item			Specification
REFRIGERANT SYSTEM			
Refrigerant	Type		R-134a
	Regular amount (approx. quantity)	(g {oz})	450 {15.9}
BASIC SYSTEM			
A/C compressor	Lubrication oil	Type	DH-PR
		Sealed volume (approx. quantity)	(ml {cc, fl oz}) 130 {130, 4.39}
CONTROL SYSTEM			
A/C compressor	Magnetic clutch clearance	(mm {in})	0.3—0.6 {0.012—0.023}



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2008 - MX-5 - HVAC

HVAC SST

49 C061 0A0B  Gas Charging Set		49 C061 013  Gas Leak Tester		49 0839 425C  Bearing Puller Set	
49 B018 003  Body B		—	—	—	—

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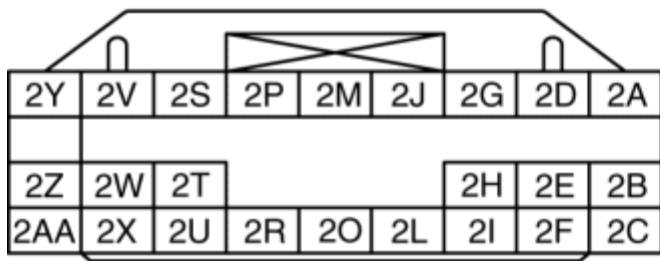
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2008 - MX-5 - Restraints

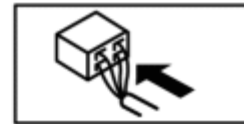
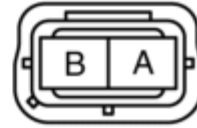
DTC B104B, B1051, B2887, U2017

DTC	B104B	Driver-side air bag sensor assembly incorrect
	B1051	Driver side side air bag sensor system internal circuit disabled
	B2887	Driver-side side air bag sensor system communication data error
	U2017	Driver side side air bag sensor system communication error
DETECTION CONDITION		<p><b>WARNING:</b></p> <ul style="list-style-type: none"><li>• Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.</li><li>• The SAS control module detects an error of impact magnitude set in the sensor, which occurs due to installation mismatch of the crash zone sensor or side air bag sensors.</li><li>• Malfunction in wiring harness between driver-side side air bag sensor and SAS control module</li><li>• Malfunction in driver-side side air bag sensor circuit</li></ul>
POSSIBLE CAUSE		<ul style="list-style-type: none"><li>• Driver-side side air bag sensor mis-installed with wrong sensor</li><li>• Driver-side side air bag sensor connector malfunction</li><li>• Open or short circuit in wiring harness between driver-side side air bag sensor and SAS control module</li><li>• Driver-side side air bag sensor malfunction</li><li>• SAS control module malfunction</li></ul>

## SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR



## DRIVER-SIDE SIDE AIR BAG SENSOR WIRING HARNESS-SIDE CONNECTOR



### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT DRIVER SIDE SIDE AIR BAG SENSOR CONNECTOR</b> <b>WARNING:</b> <ul style="list-style-type: none"> <li>Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the service warnings and cautions before handling the air bag system components.</li> </ul> <p>(See <a href="#">AIR BAG SYSTEM SERVICE WARNINGS</a>.)</p> <p>(See <a href="#">AIR BAG SYSTEM SERVICE CAUTIONS</a>.)</p> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Remove the battery cover.</li> <li>Disconnect the negative battery cable and wait for <b>1 min or more</b>. (See <a href="#">BATTERY REMOVAL/INSTALLATION [LF]</a>.)</li> <li>Remove the tire house trim (driver-side). (See <a href="#">TIRE HOUSE TRIM REMOVAL/INSTALLATION</a>.)</li> <li>Disconnect the driver-side side air bag sensor connector. (See <a href="#">SIDE AIR BAG MODULE REMOVAL/INSTALLATION</a>.)</li> <li>Inspect the driver-side side air bag sensor connector. (Corrosion, damage, and disconnected pins)</li> <li>Is there any malfunction of the driver-side side air bag sensor connector?</li> </ul>	<p>Yes Replace the driver-side side air bag sensor wiring harness.</p> <p>No Go to the next step.</p>
	<b>INSPECT WIRING HARNESS BETWEEN DRIVER-SIDE SIDE AIR</b>	

<div>2</div> <div>BAG SENSOR AND SAS CONTROL MODULE</div> <div> <ul style="list-style-type: none"> <li>Remove the column cover. (See <a href="#">COLUMN COVER REMOVAL/INSTALLATION.</a>)</li> <li>Disconnect the clock spring connector. (See <a href="#">CLOCK SPRING REMOVAL/INSTALLATION.</a>)</li> <li>Remove the glove compartment. (See <a href="#">GLOVE COMPARTMENT REMOVAL/INSTALLATION.</a>)</li> <li>Disconnect the passenger-side air bag module connector. (See <a href="#">PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.</a>)</li> <li>Disconnect the driver and passenger-side seat connectors. (See <a href="#">SEAT REMOVAL/INSTALLATION.</a>)</li> <li>Remove the back trim. (See <a href="#">BACK TRIM REMOVAL/INSTALLATION.</a>)</li> <li>Disconnect the driver and passenger-side pre-tensioner seat belt connectors. (See <a href="#">SEAT BELT REMOVAL/INSTALLATION.</a>)</li> <li>Remove the console panel. (See <a href="#">CONSOLE PANEL REMOVAL/INSTALLATION.</a>)</li> <li>Disconnect the SAS control module connectors. (See <a href="#">SAS CONTROL MODULE REMOVAL/INSTALLATION.</a>)</li> <li>Inspect the wiring harnesses between SAS control module connector terminal 2F and driver-side side air bag sensor connector terminal A, SAS control module connector terminal 2C and driver-side side air bag sensor connector terminal B for the following: <ul style="list-style-type: none"> <li>Short circuit between terminals</li> <li>Short to body ground</li> <li>Open circuit</li> </ul> </li> </ul> <div>NOTE:</div> <ul style="list-style-type: none"> <li>Inspect for continuity while shaking the wiring harness between the SAS control module and the driver-side side air bag sensor.</li> <li>Is the wiring harness normal?</li> </ul> <div>INSPECT THE WIRING HARNESS BETWEEN THE SAS CONTROL</div> </div>	<div>Yes</div> <div>Go to the next step.</div> <div>No</div> <div>Replace the wiring harness between the SAS control module and the driver-side side air bag sensor.</div>
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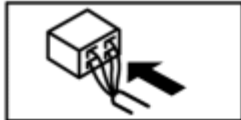
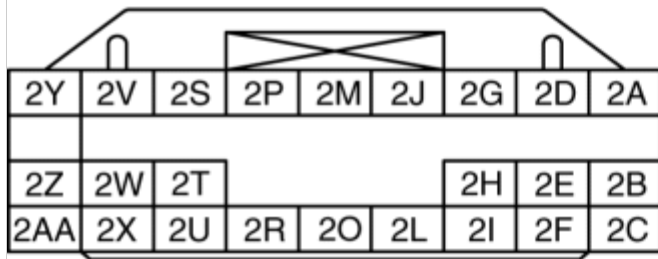
3	<p><b>MODULE AND DRIVER-SIDE SIDE AIR BAG SENSOR FOR A SHORT CIRCUIT TO THE POWER SUPPLY</b></p> <ul style="list-style-type: none"> <li>• Connect the negative battery cable.</li> <li>• Turn the ignition switch to the ON position with SAS control module connector and driver-side side air bag sensor connector disconnected.</li> <li>• Measure the voltage of SAS control module connector terminals 2F and 2C.</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• Measure the voltage while shaking the wiring harness between the SAS control module and the driver-side side air bag sensor.</li> <li>• Is the voltage measured?</li> </ul>	Yes	Replace the wiring harness between the SAS control module and the driver-side side air bag sensor.
		No	Replace the driver-side side air bag sensor, then go to the next step.
			(See <a href="#">SIDE AIR BAG MODULE REMOVAL/INSTALLATION.</a> )
4	<p><b>PERFORM SAS CONTROL MODULE DTC INSPECTION</b></p> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Disconnect the negative battery cable and wait for <b>1 min or more</b>.</li> <li>• Reconnect all disconnected connectors.</li> <li>• Connect the negative battery cable.</li> <li>• Turn the ignition switch to the ON position.</li> <li>• Clear the DTC for the SAS control module using the M-MDS.</li> </ul> <p>(See <a href="#">CLEARING DTC.</a>)</p> <ul style="list-style-type: none"> <li>• Perform the DTC inspection for the SAS control module using the M-MDS.</li> </ul> <p>(See <a href="#">DTC DISPLAY.</a>)</p> <ul style="list-style-type: none"> <li>• Are the same DTCs present?</li> </ul>	Yes	Replace the SAS control module.  (See <a href="#">SAS CONTROL MODULE REMOVAL/INSTALLATION.</a> )
		No	DTC troubleshooting completed.

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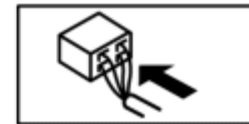
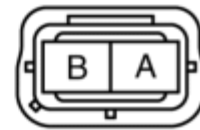
DTC B104C, B104F, B2886, U2018

DTC	B104C	Passenger-side air bag sensor assembly incorrect
	B104F	<b>Passenger side side air bag sensor</b> system internal circuit disabled
	B2886	Passenger-side side air bag sensor system communication data error
	U2018	<b>Passenger side side air bag sensor</b> system communication error
DETECTION CONDITION	<b>WARNING:</b> <ul style="list-style-type: none"><li>• Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.</li><li>• The SAS control module detects an error of impact magnitude set in the sensor, which occurs due to installation mismatch of the crash zone sensor or side air bag sensors.</li><li>• Malfunction in wiring harness between passenger-side side air bag sensor and SAS control module</li><li>• Malfunction in passenger-side side air bag sensor circuit</li></ul>	
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Passenger-side side air bag sensor mis-installed with wrong sensor</li><li>• Passenger-side side air bag sensor connector malfunction</li><li>• Open or short circuit in wiring harness between passenger-side side air bag sensor and SAS control module</li><li>• Passenger-side side air bag sensor malfunction</li><li>• SAS control module malfunction</li></ul>	

## SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR



## PASSENGER-SIDE SIDE AIR BAG SENSOR WIRING HARNESS-SIDE CONNECTOR



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT PASSENGER SIDE SIDE AIR BAG SENSOR CONNECTOR</b> <b>WARNING:</b> <ul style="list-style-type: none"> <li>Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the service warnings and cautions before handling the air bag system components.</li> </ul> <p>(See <a href="#">AIR BAG SYSTEM SERVICE WARNINGS</a>.)</p> <p>(See <a href="#">AIR BAG SYSTEM SERVICE CAUTIONS</a>.)</p> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Remove the battery cover.</li> <li>Disconnect the negative battery cable and wait for <b>1 min or more</b>. (See <a href="#">BATTERY REMOVAL/INSTALLATION [LF]</a>.)</li> <li>Remove the tire house trim (passenger-side). (See <a href="#">TIRE HOUSE TRIM REMOVAL/INSTALLATION</a>.)</li> <li>Disconnect the passenger-side side air bag sensor connector. (See <a href="#">SIDE AIR BAG MODULE REMOVAL/INSTALLATION</a>.)</li> <li>Inspect the passenger-side side air bag sensor connector. (Corrosion, damage, and disconnected pins)</li> <li>Is there any malfunction of the passenger-side side air bag sensor connector?</li> </ul>	<p>Yes Replace the passenger-side side air bag sensor wiring harness.</p> <p>No Go to the next step.</p>

<div>2</div> <div>INSPECT WIRING HARNESS BETWEEN PASSENGER-SIDE SIDE AIR BAG SENSOR AND SAS CONTROL MODULE</div>	<div>Yes</div> <div>Go to the next step.</div>
<div> <ul style="list-style-type: none"> <li>Remove the column cover. (See <a href="#">COLUMN COVER REMOVAL/INSTALLATION.</a>)</li> <li>Disconnect the clock spring connector. (See <a href="#">CLOCK SPRING REMOVAL/INSTALLATION.</a>)</li> <li>Remove the glove compartment. (See <a href="#">GLOVE COMPARTMENT REMOVAL/INSTALLATION.</a>)</li> <li>Disconnect the passenger-side air bag module connector. (See <a href="#">PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.</a>)</li> <li>Disconnect the driver and passenger-side seat connectors. (See <a href="#">SEAT REMOVAL/INSTALLATION.</a>)</li> <li>Remove the back trim. (See <a href="#">BACK TRIM REMOVAL/INSTALLATION.</a>)</li> <li>Disconnect the driver and passenger-side pre-tensioner seat belt connectors. (See <a href="#">SEAT BELT REMOVAL/INSTALLATION.</a>)</li> <li>Remove the console panel. (See <a href="#">CONSOLE PANEL REMOVAL/INSTALLATION.</a>)</li> <li>Disconnect the SAS control module connectors. (See <a href="#">SAS CONTROL MODULE REMOVAL/INSTALLATION.</a>)</li> <li>Inspect the wiring harnesses between SAS control module connector terminal 2X and passenger-side side air bag sensor connector terminal A, SAS control module connector terminal 2AA and passenger-side side air bag sensor connector terminal B for the following: <ul style="list-style-type: none"> <li>Short to circuit between terminals</li> <li>Short to body ground</li> <li>Open circuit</li> </ul> </li> </ul> </div> <div>NOTE:</div> <div> <ul style="list-style-type: none"> <li>Inspect for continuity while shaking the wiring harness between the SAS control module and the passenger-side side air bag sensor.</li> <li>Is the wiring harness normal?</li> </ul> </div>	<div>No</div> <div>Replace the wiring harness between the SAS control module and the passenger-side side air bag sensor.</div>



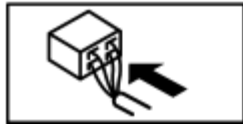
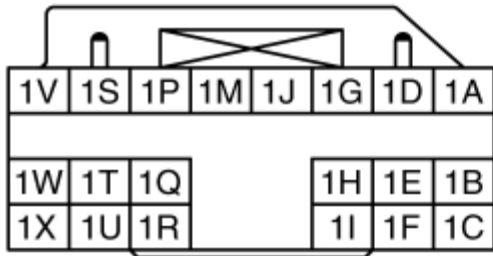
3	<p><b>INSPECT THE WIRING HARNESS BETWEEN THE SAS CONTROL MODULE AND PASSENGER-SIDE SIDE AIR BAG SENSOR FOR A SHORT CIRCUIT TO THE POWER SUPPLY</b></p> <ul style="list-style-type: none"> <li>• Connect the negative battery cable.</li> <li>• Turn the ignition switch to the ON position with SAS control module connector and passenger-side side air bag sensor connector disconnected.</li> <li>• Measure the voltage of SAS control module connector terminals 2X and 2AA.</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• Measure the voltage while shaking the wiring harness between the SAS control module and the passenger-side side air bag sensor.</li> <li>• Is the voltage measured?</li> </ul>	Yes	Replace the wiring harness between the SAS control module and the passenger-side side air bag sensor.
		No	Replace the passenger-side side air bag sensor, then go to the next step.  (See <a href="#">SIDE AIR BAG MODULE REMOVAL/INSTALLATION.</a> )
4	<p><b>PERFORM SAS CONTROL MODULE DTC INSPECTION</b></p> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Disconnect the negative battery cable and wait for <b>1 min or more</b>.</li> <li>• Reconnect all disconnected connectors.</li> <li>• Connect the negative battery cable.</li> <li>• Turn the ignition switch to the ON position.</li> <li>• Clear the DTC for the SAS control module using the M-MDS. (See <a href="#">CLEARING DTC.</a>)</li> <li>• Perform the DTC inspection for the SAS control module using the M-MDS. (See <a href="#">DTC DISPLAY.</a>)</li> <li>• Are the same DTCs present?</li> </ul>	Yes	Replace the SAS control module.  (See <a href="#">SAS CONTROL MODULE REMOVAL/INSTALLATION.</a> )
		No	DTC troubleshooting completed.

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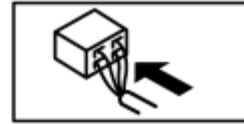
DTC B104D, B2226, B2227, B2856

DTC	B104D	Crash zone sensor assembly incorrect
	B2226	<b>Crash zone sensor</b> system internal circuit disabled
	B2227	<b>Crash zone sensor system communication error</b>
	B2856	<b>Crash zone sensor system communication data error</b>
DETECTION CONDITION		<p><b>WARNING:</b></p> <ul style="list-style-type: none"><li>• Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.</li><li>• The SAS control module detects an error of impact magnitude set in the sensor, which occurs due to installation mismatch of the crash zone sensor or side air bag sensors.</li><li>• Malfunction in wiring harness between crash zone sensor and SAS control module</li><li>• Malfunction in crash zone sensor circuit</li></ul>
POSSIBLE CAUSE		<ul style="list-style-type: none"><li>• Crash zone sensor mis-installed with wrong sensor</li><li>• Crash zone sensor connector malfunction</li><li>• Open or short circuit in the wiring harness between the crash zone sensor and SAS control module</li><li>• Crash zone sensor malfunction</li><li>• SAS control module malfunction</li></ul>

## SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR



## CRASH ZONE SENSOR WIRING HARNESS-SIDE CONNECTOR



### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT CRASH ZONE SENSOR CONNECTOR</b> <b>WARNING:</b> <ul style="list-style-type: none"> <li>Handling the component parts improperly can accidentally operate (deploy) the air bag module, which may seriously injure you. Read the service warnings/cautions and the workshop manual before handling the air bag system components.</li> </ul> <p>(See <a href="#">AIR BAG SYSTEM SERVICE WARNINGS</a>.)</p> <p>(See <a href="#">AIR BAG SYSTEM SERVICE CAUTIONS</a>.)</p> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Remove the battery cover.</li> <li>Disconnect the negative battery cable and wait for <b>1 min or more</b>. (See <a href="#">BATTERY REMOVAL/INSTALLATION [LF]</a>.)</li> <li>Remove the front bumper. (See <a href="#">FRONT BUMPER REMOVAL/INSTALLATION</a>.)</li> <li>Disconnect the crash zone sensor connector. (See <a href="#">CRASH ZONE SENSOR REMOVAL/INSTALLATION</a>.)</li> <li>Inspect the crash zone sensor connector. (Corrosion, damage, and disconnected pins)</li> <li>Is there any malfunction of the crash zone sensor connector?</li> </ul>	<p>Yes Replace the crash zone sensor wiring harness.</p> <p>No Go to the next step.</p>
2	<b>INSPECT WIRING HARNESS BETWEEN SAS CONTROL MODULE AND CRASH ZONE SENSOR</b>	<p>Yes Go to the next step.</p>

	<ul style="list-style-type: none"><li>• Remove the column cover. (See <a href="#">COLUMN COVER REMOVAL/INSTALLATION.</a>)</li><li>• Disconnect the clock spring connector. (See <a href="#">CLOCK SPRING REMOVAL/INSTALLATION.</a>)</li><li>• Remove the glove compartment. (See <a href="#">GLOVE COMPARTMENT REMOVAL/INSTALLATION.</a>)</li><li>• Disconnect the passenger-side air bag module connector. (See <a href="#">PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.</a>)</li><li>• Disconnect the driver and passenger-side seat connectors. (See <a href="#">SEAT REMOVAL/INSTALLATION.</a>)</li><li>• Remove the back trim. (See <a href="#">BACK TRIM REMOVAL/INSTALLATION.</a>)</li><li>• Remove the driver and passenger-side pre-tensioner seat belt connectors. (See <a href="#">SEAT BELT REMOVAL/INSTALLATION.</a>)</li><li>• Remove the console panel. (See <a href="#">CONSOLE PANEL REMOVAL/INSTALLATION.</a>)</li><li>• Disconnect the SAS control module connectors. (See <a href="#">SAS CONTROL MODULE REMOVAL/INSTALLATION.</a>)</li><li>• Inspect the wiring harnesses between SAS control module connector terminal 1E and crash zone sensor connector terminal A, SAS control module connector terminal 1B and crash zone sensor connector terminal B for the following:<ul style="list-style-type: none"><li>▪ Short circuit between terminals</li><li>▪ Short to body ground</li><li>▪ Open circuit</li></ul></li></ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"><li>• Inspect for continuity while shaking the wiring harness between the SAS control module and crash zone sensor.</li><li>• Is the wiring harness normal?</li></ul>	No	Replace the wiring harness between the SAS control module and the crash zone sensor.
3	<b>INSPECT THE WIRING HARNESS BETWEEN THE SAS CONTROL MODULE AND CRASH ZONE SENSOR FOR A SHORT CIRCUIT TO THE POWER SUPPLY</b>	Yes	Replace the wiring harness between the SAS

	<ul style="list-style-type: none"> <li>• Connect the negative battery cable.</li> <li>• Turn the ignition switch to the ON position with SAS control module and crash zone sensor connector disconnected.</li> <li>• Measure the voltage of SAS control module connector terminals 1B and 1E.</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• Measure the voltage while shaking the wiring harness between the SAS control module and crash zone sensor.</li> <li>• Is the voltage measured?</li> </ul>	<p>control module and the crash zone sensor.</p> <p>No Replace the crash zone sensor, then go to the next step.</p> <p>(See <a href="#">CRASH ZONE SENSOR REMOVAL/INSTALLATION.</a>)</p>
4	<p><b>PERFORM SAS CONTROL MODULE DTC INSPECTION</b></p> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Disconnect the negative battery cable and wait for <b>1min or more</b>.</li> <li>• Connect the crash zone sensor connector.</li> <li>• Connect the SAS control module connectors.</li> <li>• Connect the negative battery cable.</li> <li>• Turn the ignition switch to the ON position.</li> <li>• Clear the DTC for the SAS control module using the M-MDS.</li> </ul> <p>(See <a href="#">CLEARING DTC.</a>)</p> <ul style="list-style-type: none"> <li>• Perform the DTC inspection for the SAS control module using the M-MDS.</li> </ul> <p>(See <a href="#">DTC DISPLAY.</a>)</p> <ul style="list-style-type: none"> <li>• Are the same DTCs present?</li> </ul>	<p>Yes Replace the SAS control module.</p> <p>(See <a href="#">SAS CONTROL MODULE REMOVAL/INSTALLATION.</a>)</p> <p>No DTC troubleshooting completed.</p>

[Next >](#)

## 2008 - MX-5 - Restraints

### FOREWORD

#### Outline

- The OBD (on-board diagnostic) system has the following functions:
  - Malfunction detection function: Detects malfunctions in the air bag system and outputs DTCs.
  - Data monitor function: Reads out specific input/output signals and the system status.
- Diagnostic DTCs can be read/cleared using the M-MDS.

[Next >](#)

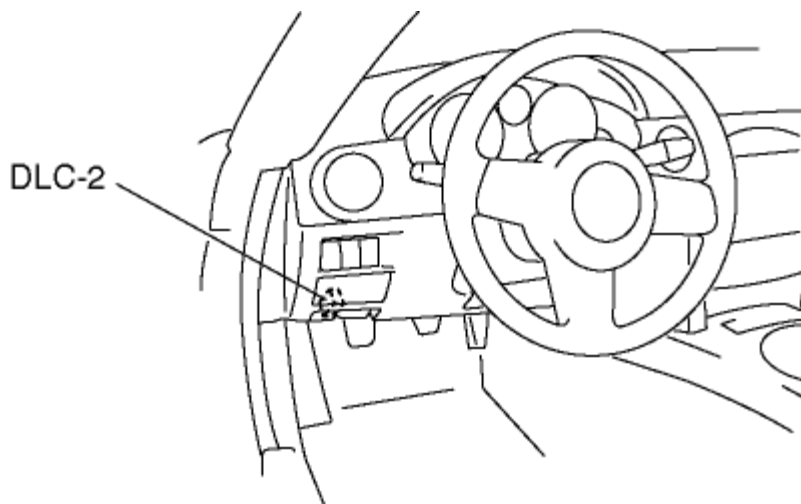
[Back to Top](#)

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## 2008 - MX-5 - Restraints

### DTC DISPLAY

1. Connect the M-MDS to the DLC-2.

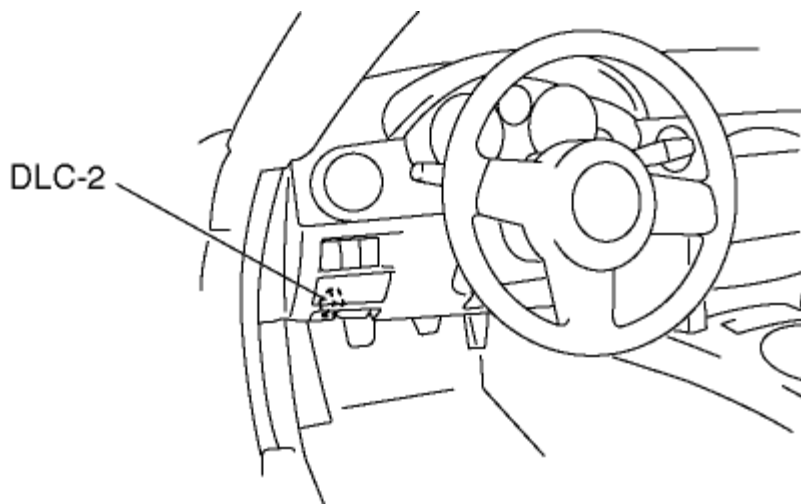


2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.
  - When using the IDS (laptop PC)
    - Select "Self Test".
    - Select "Modules".
    - Select "RCM".
  - When using the PDS (Pocket PC)
    - Select "Module Tests".
    - Select "RCM".
    - Select "Self Test".
3. Verify the DTC according to the directions on the screen.
  - If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.
4. After completion of repairs, clear all DTCs stored in the SAS control module. (See **CLEARING DTC.**)

## 2008 - MX-5 - Restraints

### CLEARING DTC

1. Connect the M-MDS to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  - Select "Self Test".
  - Select "Modules".
  - Select "RCM".
- When using the PDS (Pocket PC)
  - Select "Module Tests".
  - Select "RCM".
  - Select "Self Test".

3. Verify the DTC according to the directions on the screen.
4. Press the clear button on the DTC screen to clear the DTC.
5. Verify that no DTCs are displayed.







## 2008 - MX-5 - Restraints









## DTC TABLE





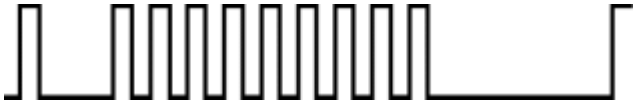



- DTCs are common for present and past malfunction diagnosis.







**NOTE:**

- When DTCs not shown in the DTC table are displayed, replace the SAS control module.
- If the air bag system warning light does not illuminate or remains illuminated when the ignition switch is turned to the ON position, inspect and repair the air bag system warning light circuit, and then confirm that the air bag system warning light is operational.
- The air bag system warning light flashes the DTC pattern for five cycles, and then remains illuminated until the ignition switch is turned to the LOCK position.
- If the SAS control module configuration is performed while the SRS air bag system circuit has a malfunction, the air bag system warning light flashes. Verify that the warning light goes out approx. 15 s after the system circuit malfunction is solved.


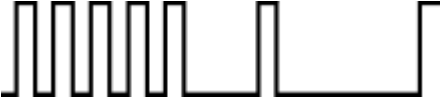
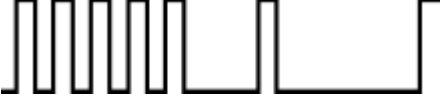








DTC			System malfunction location	Page
M-MDS display	Air bag system warning light			
	Flashing pattern	Priority ranking		
B1013	48		14	Seat weight sensor calibration error  (See DTC B1013.)
B1047	22		7	Driver-side side air bag module assembly incorrect  (See DTC B1047, B1992, B1993, B1994, B1995.)
B104B	63		12	Driver-side side air bag sensor assembly incorrect  (See DTC B104B, B1051, B2887, U2017.)
B104C	64		13	Passenger-side side air bag sensor assembly incorrect  (See DTC B104C, B104F, B2886, U2018.)






B104D	42		11	Crash zone sensor assembly incorrect	(See <a href="#">DTC B104D</a> , <a href="#">B2226</a> , <a href="#">B2227</a> , <a href="#">B2856</a> .)
B104F	64		13	Passenger-side side air bag sensor system internal circuit disabled	(See <a href="#">DTC B104C</a> , <a href="#">B104F</a> , <a href="#">B2886</a> , <a href="#">U2018</a> .)
B1051	63		12	Driver-side side air bag sensor system internal circuit disabled	(See <a href="#">DTC B104B</a> , <a href="#">B1051</a> , <a href="#">B2887</a> , <a href="#">U2017</a> .)
B1055	23		8	Passenger-side side air bag module assembly incorrect	(See <a href="#">DTC B1055</a> , <a href="#">B1996</a> , <a href="#">B1997</a> , <a href="#">B1998</a> , <a href="#">B1999</a> .)
B1318	—	Continuously illuminated	1	The power supply voltage decreases (less than 9 V)	(See <a href="#">DTC B1318</a> .)
B1342	12		4	SAS control module	(See <a href="#">DTC B1342</a> .)
B1428	57		20	Seat belt warning light circuit open	(See <a href="#">DTC B1428</a> .)
B1869	—	Continuously illuminated	1	Air bag system warning light circuit open	(See <a href="#">DTC B1869</a> .)
	—	Does not illuminate	—	Air bag system warning light circuit short to body ground	
B1871	56		18	Passenger air bag deactivation (PAD) switch system circuit disabled	(See <a href="#">DTC B1871</a> .)
B1877				Driver-side pre-tensioner seat belt circuit resistance high	(See <a href="#">DTC B1877</a> , <a href="#">B1878</a> , <a href="#">B1879</a> , <a href="#">B1885</a> .)
B1878	33		9	Driver-side pre-tensioner seat belt circuit short to power supply	

B1879				Driver-side pre-tensioner seat belt circuit short to body ground	
B1881				Passenger-side pre-tensioner seat belt circuit resistance high	(See <a href="#">DTC B1881</a> , <a href="#">B1882</a> , <a href="#">B1883</a> , <a href="#">B1886</a> .)
B1882	34		10	Passenger-side pre-tensioner seat belt circuit short to power supply	
B1883				Passenger-side pre-tensioner seat belt circuit short to body ground	
B1884	18		19	Passenger air bag deactivation (PAD) indicator circuit open or short to body ground	(See <a href="#">DTC B1884</a> .)
B1885	33		9	Driver-side pre-tensioner seat belt circuit resistance low	(See <a href="#">DTC B1877</a> , <a href="#">B1878</a> , <a href="#">B1879</a> , <a href="#">B1885</a> .)
B1886	34		10	Passenger-side pre-tensioner seat belt circuit resistance low	(See <a href="#">DTC B1881</a> , <a href="#">B1882</a> , <a href="#">B1883</a> , <a href="#">B1886</a> .)
B1916	19		5	Driver-side air bag module (inflator No.1) circuit short to power supply	(See <a href="#">DTC B1916</a> , <a href="#">B1932</a> , <a href="#">B1934</a> , <a href="#">B1936</a> .)
B1925	21		6	Passenger-side air bag module (inflator No.1) circuit short to power supply	(See <a href="#">DTC B1925</a> , <a href="#">B1933</a> , <a href="#">B1935</a> , <a href="#">B1938</a> .)
B1932	19		5	Driver-side air bag module (inflator No.1) circuit resistance high	(See <a href="#">DTC B1916</a> , <a href="#">B1932</a> , <a href="#">B1934</a> , <a href="#">B1936</a> .)
B1933	21		6	Passenger-side air bag module (inflator No.1) circuit resistance high	(See <a href="#">DTC B1925</a> , <a href="#">B1933</a> , <a href="#">B1935</a> , <a href="#">B1938</a> .)

B1934	19		5	Driver-side air bag module (inflator No.1) circuit resistance low	(See <a href="#">DTC B1916</a> , <a href="#">B1932</a> , <a href="#">B1934</a> , <a href="#">B1936</a> .)
B1935	21		6	Passenger-side air bag module (inflator No.1) circuit resistance low	(See <a href="#">DTC B1925</a> , <a href="#">B1933</a> , <a href="#">B1935</a> , <a href="#">B1938</a> .)
B1936	19		5	Driver-side air bag module (inflator No.1) circuit short to body ground	(See <a href="#">DTC B1916</a> , <a href="#">B1932</a> , <a href="#">B1934</a> , <a href="#">B1936</a> .)
B1938	21		6	Passenger-side air bag module (inflator No.1) circuit short to body ground	(See <a href="#">DTC B1925</a> , <a href="#">B1933</a> , <a href="#">B1935</a> , <a href="#">B1938</a> .)
B1992	22		7	Driver-side side air bag module circuit short to power supply	(See <a href="#">DTC B1047</a> , <a href="#">B1992</a> , <a href="#">B1993</a> , <a href="#">B1994</a> , <a href="#">B1995</a> .)
B1993				Driver-side side air bag module circuit short to body ground	
B1994				Driver-side side air bag module circuit resistance high	
B1995				Driver-side side air bag module circuit resistance low	
B1996	23		8	Passenger-side side air bag module circuit short to power supply	(See <a href="#">DTC B1055</a> , <a href="#">B1996</a> , <a href="#">B1997</a> , <a href="#">B1998</a> , <a href="#">B1999</a> .)
B1997				Passenger-side side air bag module circuit short to body ground	
B1998				Passenger-side side air bag module circuit resistance high	
B1999				Passenger-side side air bag module circuit	

				resistance low	
B2226	42		11	Crash zone sensor system internal circuit disabled	(See <a href="#">DTC B104D</a> , <a href="#">B2226</a> , <a href="#">B2227</a> , <a href="#">B2856</a> .)
B2227				Crash zone sensor system communication error	
B2228	19		5	Driver-side air bag module (inflator No.2) circuit short to body ground	(See <a href="#">DTC B2228</a> , <a href="#">B2230</a> , <a href="#">B2232</a> , <a href="#">B2234</a> .)
B2229	21		6	Passenger-side air bag module (inflator No.2) circuit short to body ground	(See <a href="#">DTC B2229</a> , <a href="#">B2231</a> , <a href="#">B2233</a> , <a href="#">B2235</a> .)
B2230	19		5	Driver-side air bag module (inflator No.2) circuit short to power supply	(See <a href="#">DTC B2228</a> , <a href="#">B2230</a> , <a href="#">B2232</a> , <a href="#">B2234</a> .)
B2231	21		6	Passenger-side air bag module (inflator No.2) circuit short to power supply	(See <a href="#">DTC B2229</a> , <a href="#">B2231</a> , <a href="#">B2233</a> , <a href="#">B2235</a> .)
B2232	19		5	Driver-side air bag module (inflator No.2) circuit resistance high	(See <a href="#">DTC B2228</a> , <a href="#">B2230</a> , <a href="#">B2232</a> , <a href="#">B2234</a> .)
B2233	21		6	Passenger-side air bag module (inflator No.2) circuit resistance high	(See <a href="#">DTC B2229</a> , <a href="#">B2231</a> , <a href="#">B2233</a> , <a href="#">B2235</a> .)
B2234	19		5	Driver-side air bag module (inflator No.2) circuit resistance low	(See <a href="#">DTC B2228</a> , <a href="#">B2230</a> , <a href="#">B2232</a> , <a href="#">B2234</a> .)
B2235	21		6	Passenger-side air bag module (inflator No.2) circuit resistance low	(See <a href="#">DTC B2229</a> , <a href="#">B2231</a> , <a href="#">B2233</a> , <a href="#">B2235</a> .)
B2290	48		14	Passenger sensing system malfunction	(See <a href="#">DTC B2290</a> .)

					
B2433	51		16	Driver-side buckle switch circuit open or short to power supply	(See <a href="#">DTC B2433</a> , <a href="#">B2434</a> .)
B2434	51		16	Driver-side buckle switch circuit short to body ground	(See <a href="#">DTC B2433</a> , <a href="#">B2434</a> .)
B2437	52		17	Passenger-side buckle switch circuit open or short to power supply	(See <a href="#">DTC B2437</a> , <a href="#">B2438</a> .)
B2438	52		17	Passenger-side buckle switch circuit short to body ground	(See <a href="#">DTC B2437</a> , <a href="#">B2438</a> .)
B2477	54		2	Configuration error	(See <a href="#">DTC B2477</a> .)
B2856	42		11	Crash zone sensor system communication data error	(See <a href="#">DTC B104D</a> , <a href="#">B2226</a> , <a href="#">B2227</a> , <a href="#">B2856</a> .)
B2867	31		3	Poor connection of any SAS control module connectors	(See <a href="#">DTC B2867</a> .)
B2886	64		13	Passenger-side side air bag sensor system communication data error	(See <a href="#">DTC B104C</a> , <a href="#">B104F</a> , <a href="#">B2886</a> , <a href="#">U2018</a> .)
B2887	63		12	Driver-side side air bag sensor system communication data error	(See <a href="#">DTC B104B</a> , <a href="#">B1051</a> , <a href="#">B2887</a> , <a href="#">U2017</a> .)
C1946	49		15	Seat track position sensor circuit open	(See <a href="#">DTC C1946</a> , <a href="#">C1947</a> , <a href="#">C1948</a> , <a href="#">C1982</a> .)
C1947	49		15	Seat track position sensor circuit short to body	(See <a href="#">DTC C1946</a> , <a href="#">C1947</a> , <a href="#">C1948</a> ,

				ground	<a href="#">C1982.</a> )
C1948	49		15	Seat track position sensor circuit resistance not within specification	(See <a href="#">DTC C1946</a> , <a href="#">C1947</a> , <a href="#">C1948</a> , <a href="#">C1982.</a> )
C1982	49		15	Seat track position sensor circuit short to power supply	(See <a href="#">DTC C1946</a> , <a href="#">C1947</a> , <a href="#">C1948</a> , <a href="#">C1982.</a> )
U2017	63		12	Driver-side side air bag sensor system communication error	(See <a href="#">DTC B104B</a> , <a href="#">B1051</a> , <a href="#">B2887</a> , <a href="#">U2017.</a> )
U2018	64		13	Passenger-side side air bag sensor system communication error	(See <a href="#">DTC B104C</a> , <a href="#">B104F</a> , <a href="#">B2886</a> , <a href="#">U2018.</a> )

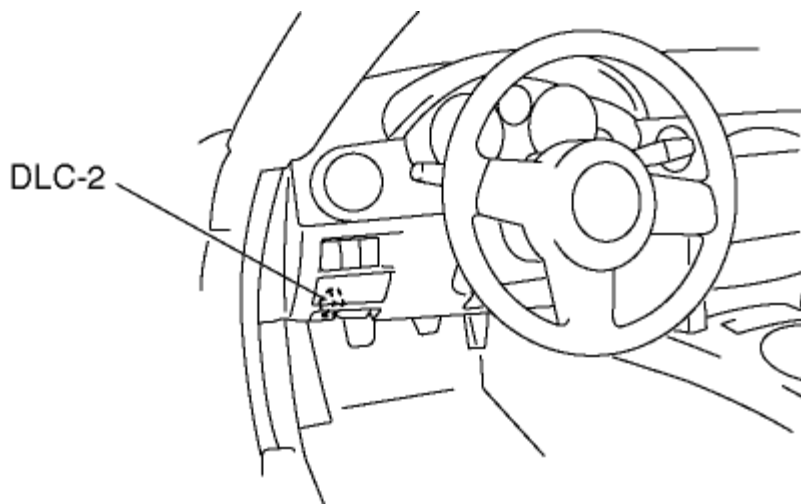
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## 2008 - MX-5 - Restraints

### PID/DATA MONITOR DISPLAY

1. Connect the M-MDS to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  - Select "DataLogger".
  - Select "Modules".
  - Select "RCM".
- When using the PDS (Pocket PC)
  - Select "Module Tests".
  - Select "RCM".
  - Select "DataLogger".

3. Select the applicable PID from the PID table.
4. Verify the PID data according to the directions on the screen.

#### NOTE:

- The PID data screen function is used for monitoring the calculated value. Therefore, if the monitored value of the output parts is not within the specification, inspection of the monitored value of input parts corresponding to applicable output part control is necessary. In addition, because the system does not display output part malfunction as abnormality in the monitored value, it is necessary to inspect the output part individually.





## 2008 - MX-5 - Restraints

### PID/DATA MONITOR TABLE

#### PID/data monitor table

PID name (definition)	Unit/Condition	Operation Condition (Reference)	Terminal
BUCKLE_D (Driver-side buckle switch status)	Buckled/ Unbuckled	<ul style="list-style-type: none"> <li>Driver-side buckle switch on: Buckled</li> <li>Driver-side buckle switch off: Unbuckled</li> </ul>	3A, 3D
BUCKLE_P (Passenger-side buckle switch status)	Buckled/ UNbuckled	<ul style="list-style-type: none"> <li>Passenger-side buckle switch on: Buckled</li> <li>Passenger-side buckle switch off: Unbuckled</li> </ul>	3J, 3G
CCNT_RCM (Number of continuous DTCs)	—	<ul style="list-style-type: none"> <li>DTCs detected: 1—255</li> <li>No DTCs detected: 0</li> </ul>	—
CR2D_Comm (Driver-side side air bag sensor system communication data error)	OK/ FAULT	<ul style="list-style-type: none"> <li>Sensor normal: OK</li> <li>Sensor communication malfunction: FAULT</li> </ul>	2C, 2F
CR2D_Inter (Driver-side side air bag sensor system internal circuit disabled)	OK/ FAULT	<ul style="list-style-type: none"> <li>Sensor normal: OK</li> <li>Sensor internal malfunction: FAULT</li> </ul>	2C, 2F
CR2D_Mount (Driver-side side air bag sensor assembly incorrect)	OK/ FAULT	<ul style="list-style-type: none"> <li>Sensor normal: OK</li> <li>Sensor Install malfunction: FAULT</li> </ul>	2C, 2F
CR2D_Short (Driver-side side air bag sensor system communication error)	OK/ FAULT	<ul style="list-style-type: none"> <li>Sensor normal: OK</li> <li>Sensor open or short circuit: FAULT</li> </ul>	2C, 2F
CR2P_Comm (Passenger-side side air bag sensor	OK/ FAULT	<ul style="list-style-type: none"> <li>Sensor normal: OK</li> <li>Sensor communication</li> </ul>	2X, 2AA

system communication data error)		malfunction: FAULT	
CR2P_Inter (Passenger-side side air bag sensor system internal circuit disabled)	OK/ FAULT	<ul style="list-style-type: none"> <li>• Sensor normal: OK</li> <li>• Sensor internal malfunction: FAULT</li> </ul>	2X, 2AA
CR2P_Mount (Passenger-side side air bag sensor assembly incorrect)	OK/ FAULT	<ul style="list-style-type: none"> <li>• Sensor normal: OK</li> <li>• Senso Install malfunction: FAULT</li> </ul>	2X, 2AA
CR2P_Short (Passenger-side side air bag sensor system communication error)	OK/ FAULT	<ul style="list-style-type: none"> <li>• Sensor normal: OK</li> <li>• Sensor open or short circuit: FAULT</li> </ul>	2X, 2AA
DTC_CLR_ST* (Seat weight sensor status)	Starting/ Normal End/ In Process/ OCS Fault	Fault information cleared at seat weight sensor	3B
IGN_V_2 (IG1 voltage)	V	Ignition switch is at ON: B+	—
I_PAD_SW (PAD switch status)	On/ Off	<ul style="list-style-type: none"> <li>• PAD switch is at PASS AIRBAG ON position: On</li> <li>• PAD switch is at PASS AIRBAG OFF position: Off</li> </ul>	—
OCS_CAL_ST* (Seat weight sensor calibration status)	Starting/ Normal End/ Commanding/ NG (Voltage)/ NG (Weight)/ Timeout/ In Process/ OCS Fault	<ul style="list-style-type: none"> <li>• Seat weight sensor calibration start-up: Starting</li> <li>• Seat weight sensor calibration completed normally: Normal End</li> <li>• Seat weight sensor calibration command being sent: Commanding</li> <li>• Voltage malfunction during seat weight sensor calibration: NG (Voltage)</li> <li>• Weight error during seat weight sensor calibration: NG (Weight)</li> <li>• Seat weight sensor calibration time limit passed: Timeout</li> </ul>	3B

		<ul style="list-style-type: none"> <li>• Seat weight sensor calibration being processed: In Process</li> <li>• Seat weight sensor or Seat weight sensor control module malfunction: OCS Fault</li> </ul>	
OCS_PSG_ST* (Seat weight sensor status)	Empty/ Child/ Adult/ OCS Fault	Occupant classification status determined by seat weight sensor	3B
OCSFLT_CAL (Seat weight sensor calibration calibration status)	OK/ FAULT	<ul style="list-style-type: none"> <li>• Sensor normal: OK</li> <li>• Passenger sensing system error: FAULT</li> </ul>	3B
OCSFLT_COM (Seat weight sensor control module communication status)	OK/ FAULT	<ul style="list-style-type: none"> <li>• Sensor normal: OK</li> <li>• Passenger sensing system communication error: FAULT</li> </ul>	3B
OCSFLT_L (Seat weight sensor (LH) malfunction status)	OK/ FAULT	<ul style="list-style-type: none"> <li>• Sensor normal: OK</li> <li>• Passenger sensing system (LH) malfunction: FAULT</li> </ul>	3B
OCSFLT_MDL (Seat weight sensor control module malfunction status)	OK/ FAULT	<ul style="list-style-type: none"> <li>• Sensor normal: OK</li> <li>• Passenger sensing system control module malfunction: FAULT</li> </ul>	3B
OCSFLT_R (Seat weight sensor (RH) malfunction status)	OK/ FAULT	<ul style="list-style-type: none"> <li>• Sensor normal: OK</li> <li>• Passenger sensing system (RH) malfunction: FAULT</li> </ul>	3B
OCSFLT_SNS (Seat weight sensor malfunction status)	OK/ FAULT	<ul style="list-style-type: none"> <li>• Sensor normal: OK</li> <li>• Passenger sensing system malfunction: FAULT</li> </ul>	3B
PS_WEIGHT (Seat weight sensor measured weight of passenger)	kg	Display of load (body weight) on passenger-side seat	3B
RES_AB_D (Driver-side air bag module (inflator	Ohm	Under any condition: 1.5—4.7 ohms	1A, 1D

No. 1) resistance)			
RES_AB_P (Passenger-side air bag (inflator No. 1) module resistance)	Ohm	Under any condition: 1.3—4.7 ohms	1V, 1S
RES_AB2_D (Driver-side air bag module (inflator No. 2) resistance)	Ohm	Under any condition: 1.5—4.7 ohms	1J, 1G
RES_AB2_P (Passenger-side air bag (inflator No. 2) module resistance)	Ohm	Under any condition: 1.3—4.7 ohms	1M, 1P
RES_PT_D (Driver-side pre-tensioner seat belt resistance)	Ohm	Under any condition: 1.3—4.7 ohms	2A, 2D
RES_PT_P (Passenger-side pre-tensioner seat belt resistance)	Ohm	Under any condition: 1.3—4.7 ohms	2Y, 2V
RES_SAB_D (Driver-side side air bag module resistance)	Ohm	Under any condition: 1.3—4.7 ohms	2J, 2G
RES_SAB_P (Passenger-side side air bag module resistance)	Ohm	Under any condition: 1.3—4.7 ohms	2P, 2S
TRAK_SW (Seat track position sensor state)	Forward/ Rearward	<ul style="list-style-type: none"> <li>• Seat front position: Forward</li> <li>• Seat rear position: Rearward</li> </ul>	3M, 3P

\*

**Used during seat weight sensor calibration setting. Not necessary for diagnostic.**

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2008 - MX-5 - Restraints

DTC B1013

DTC B1013	Seat weight sensor calibration error
DETECTION CONDITION	<p><b>WARNING:</b></p> <ul style="list-style-type: none"><li>• Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.</li><li>• Calibration set value not within valid range.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Weight acting on passenger-side seat during calibration</li><li>• Improperly installed passenger-side seat part at time of calibration</li><li>• Deformed floor where attached to passenger-side seat</li><li>• Deformed passenger-side seat under-bracket or frame</li><li>• Seat weight sensor deformed or malfunction</li><li>• Seat weight sensor control module malfunction</li><li>• SAS control module malfunction</li></ul>

Diagnostic procedure

STEP	INSPECTION	ACTION
1	<p><b>INSPECT SEAT WEIGHT SENSOR</b></p> <ul style="list-style-type: none"><li>• Properly install the passenger-side seat.</li><li>• Inspect the seat weight sensor. (See <a href="#">SEAT WEIGHT SENSOR CALIBRATION.</a>)</li><li>• Is the seat weight sensor normal?</li></ul>	YesReplace the SAS control module.  (See <a href="#">SAS CONTROL MODULE REMOVAL/INSTALLATION.</a> )
		NoGo to the next step.
2	<p><b>INSPECT PASSENGER-SIDE SEAT</b></p>	YesReplace any deformed parts or remove any foreign

	<p>Turn the ignition switch to the LOCK position.</p> <ul style="list-style-type: none"><li>• Disconnect the negative battery cable and wait for <b>1 min or more</b>.</li><li>• Remove the passenger-side seat and visually inspect for the following:<ul style="list-style-type: none"><li>▪ Seat under-bracket deformation</li><li>▪ Seat frame deformation</li><li>▪ Seat weight sensor deformation</li><li>▪ Foreign objects stuck in seat</li></ul></li><li>• Are any of the parts deformed or are any foreign objects stuck in the seat?</li></ul>	objects.	<ul style="list-style-type: none"><li>• After replacement, perform seat weight sensor calibration and reperform the DTC inspection. If the DTC is displayed, go the next step. (See <b>SEAT WEIGHT SENSOR CALIBRATION</b>.)</li></ul>
		No	Go to the next step.
3	<p><b>INSPECT FLOOR</b></p> <ul style="list-style-type: none"><li>• Visually inspect the installation parts of the passenger-side seat for the following:<ul style="list-style-type: none"><li>▪ Abnormal floor deformation</li><li>▪ Installation hole of passenger-side seat is improperly positioned</li></ul></li><li>• Is the floor normal?</li></ul>	Yes	Go to the next step.
		No	Repair floor deformation. <ul style="list-style-type: none"><li>• After repair, perform seat weight sensor calibration and reperform the DTC inspection. If the DTC is displayed even though the floor has been repaired, go the next step. (See <b>SEAT WEIGHT SENSOR CALIBRATION</b>.)</li></ul>
4	<p><b>INSPECT SEAT WEIGHT SENSOR CONTROL MODULE</b></p> <ul style="list-style-type: none"><li>• Replace the seat weight sensor.</li><li>• After replacement, perform seat weight sensor calibration. (See <b>SEAT</b></li></ul>	Yes	Replace the seat weight sensor control module.  (See <b>SEAT WEIGHT SENSOR CONTROL MODULE REMOVAL/INSTALLATION</b> .) <ul style="list-style-type: none"><li>• After replacement, perform seat weight sensor calibration and reperform the DTC inspection. If the</li></ul>

	<b>WEIGHT SENSOR CALIBRATION.)</b> <ul style="list-style-type: none"><li>• Reperform the DTC inspection.</li><li>• Is DTC B1013 indicated?</li></ul>		DTC is displayed even though the seat weight sensor control module has been replaced, replace the SAS control module. (See <b>SAS CONTROL MODULE REMOVAL/INSTALLATION.</b> )
		No DTC troubleshooting completed.	



## 2008 - MX-5 - Restraints

### DTC B1342

DTC B1342	SAS control module
<b>DETECTION CONDITION</b>	<p><b>WARNING:</b></p> <ul style="list-style-type: none"><li>• Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection with only detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.</li><li>• Malfunction in the SAS control module internal circuit</li></ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"><li>• SAS control module malfunction</li></ul>

### Diagnostic procedure

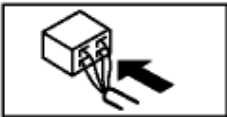
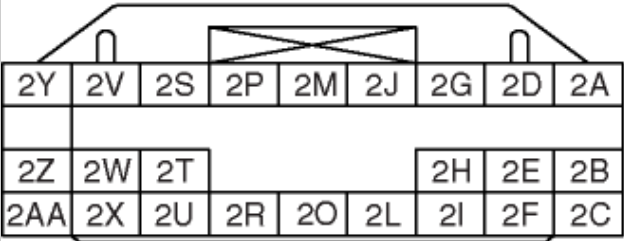
ACTION
<ul style="list-style-type: none"><li>• Replace the SAS control module.</li></ul> <p>(See <a href="#">SAS CONTROL MODULE REMOVAL/INSTALLATION</a>.)</p>

2008 - MX-5 - Restraints

DTC B1877, B1878, B1879, B1885

DTC	B1877	Driver-side pre-tensioner seat belt circuit resistance high
	B1878	Driver-side pre-tensioner seat belt circuit short to power supply
	B1879	Driver-side pre-tensioner seat belt circuit short to body ground
	B1885	Driver-side pre-tensioner seat belt circuit resistance low
DETECTION CONDITION	<p><b>WARNING:</b></p> <ul style="list-style-type: none"><li>• Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.</li><li>• Resistance other than <b>1.3—4.7 ohms</b> detected in driver-side pre-tensioner seat belt circuit</li><li>• Malfunction in the wiring harness between driver-side pre-tensioner seat belt and SAS control module</li></ul>	
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Open or short circuit in wiring harness between driver-side pre-tensioner seat belt and SAS control module</li><li>• Driver-side pre-tensioner seat belt malfunction</li><li>• SAS control module malfunction</li></ul>	

SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR



DRIVER-SIDE PRE-TENSIONER SEAT BELT WIRING HARNESS-SIDE CONNECTOR



## Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>INSPECT DRIVER SIDE PRE-TENSIONER SEAT BELT</b> <ul style="list-style-type: none"> <li>Using the M-MDS, verify the following PID/DATA monitor. (See <a href="#">PID/DATA MONITOR TABLE</a>.) <ul style="list-style-type: none"> <li>RES_PT_D</li> </ul> </li> <li>Is the driver-side pre-tensioner seat belt resistance normal? <ul style="list-style-type: none"> <li>Resistance: <b>1.3—4.7 ohms</b></li> </ul> </li> </ul>	Yes	Replace the SAS control module.  (See <a href="#">SAS CONTROL MODULE REMOVAL/INSTALLATION</a> .)
		No	Go to the next step.
2	<b>INSPECT DRIVER SIDE PRE-TENSIONER SEAT BELT CONNECTOR</b> <b>WARNING:</b> <ul style="list-style-type: none"> <li>Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components.  (See <a href="#">AIR BAG SYSTEM SERVICE WARNINGS</a>.) (See <a href="#">AIR BAG SYSTEM SERVICE CAUTIONS</a>.)</li> <li>Turn the ignition switch to the LOCK position.</li> <li>Remove the battery cover.</li> <li>Disconnect the negative battery cable and wait for <b>1 min or more</b>.  (See <a href="#">BATTERY REMOVAL/INSTALLATION [LF]</a>.)</li> <li>Remove the back trim.</li> <li>Disconnect the driver-side pre-tensioner seat belt connector.</li> <li>Is there any malfunction of the driver-side pre-tensioner seat belt connector?</li> </ul>	Yes	Replace the air bag wiring harness.
		No	Go to the next step.
3	<b>VERIFY WHETHER MALFUNCTION IS IN DRIVER SIDE PRE-TENSIONER SEAT BELT OR RELATED WIRING HARNESS</b> <ul style="list-style-type: none"> <li>Connect the leads of the <b>SST</b> (Fuel and thermometer checker) or apply <b>2-ohm</b> resistance to driver-side pre-tensioner seat belt connector terminals A and B.</li> <li>Set the resistance of the <b>SST</b> (Fuel and thermometer checker) to the <b>2-ohm</b> position.</li> <li>Connect the negative battery cable.</li> <li>Turn the ignition switch to the ON position.</li> <li>Are DTCs B1877, B1878, B1879, and/or B1885 indicated?</li> </ul>	Yes	Go to the next step.
		No	Replace the driver-side pre-tensioner seat belt.  (See <a href="#">SEAT BELT REMOVAL/INSTALLATION</a> .)
	<b>INSPECT WIRING HARNESS BETWEEN DRIVER SIDE PRE-TENSIONER</b>		

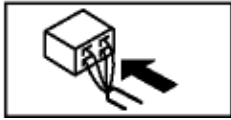
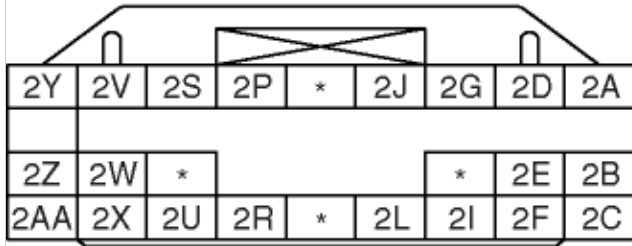
<div>4</div>	<div>SEAT BELT AND SAS CONTROL MODULE</div> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Remove the battery cover.</li> <li>• Disconnect the negative battery cable and wait for <b>1 min or more</b>. (See <b>BATTERY REMOVAL/INSTALLATION [LF]</b>.)</li> <li>• Remove the column cover.</li> <li>• Disconnect the clock spring connector.</li> <li>• Remove the glove compartment.</li> <li>• Disconnect the passenger-side air bag module connector. (See <b>PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION</b>.)</li> <li>• Disconnect the driver and passenger-side seat connectors.</li> <li>• Remove the back trim.</li> <li>• Disconnect the driver and passenger-side pre-tensioner seat belt connectors.</li> <li>• Inspect the wiring harness between SAS control module terminal 2A and driver-side pre-tensioner seat belt terminal A, SAS control module terminal 2D and driver-side pre-tensioner seat belt terminal B for the following: <ul style="list-style-type: none"> <li>▪ Short to ground</li> <li>▪ Short to power supply</li> <li>▪ Open circuit</li> </ul> </li> <li>• Is the wiring harness normal?</li> </ul>	<div> <div>Yes</div> <div>Replace the SAS control module.  (See <b>SAS CONTROL MODULE REMOVAL/INSTALLATION</b>.)</div> </div> <div> <div>No</div> <div>Replace the air bag wiring harness.</div> </div>
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2008 - MX-5 - Restraints

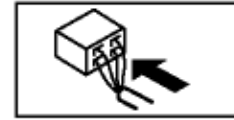
DTC B1881, B1882, B1883, B1886

DTC	B1881	Passenger-side pre-tensioner seat belt circuit resistance high
	B1882	Passenger-side pre-tensioner seat belt circuit short to power supply
	B1883	Passenger-side pre-tensioner seat belt circuit short to body ground
	B1886	Passenger-side pre-tensioner seat belt circuit resistance low
DETECTION CONDITION	<p><b>WARNING:</b></p> <ul style="list-style-type: none"><li>• Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.</li><li>• Resistance other than <b>1.3—4.7 ohms</b> detected in passenger-side pre-tensioner seat belt circuit</li><li>• Malfunction in wiring harness between passenger-side pre-tensioner seat belt and SAS control module</li></ul>	
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Open or short circuit in wiring harness between passenger-side pre-tensioner seat belt and SAS control module</li><li>• Passenger-side pre-tensioner seat belt malfunction</li><li>• SAS control module malfunction</li></ul>	

## SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR



## PASSENGER-SIDE PRE-TENSIONER SEAT BELT WIRING HARNESS-SIDE CONNECTOR



### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT PASSENGER SIDE PRE-TENSIONER SEAT BELT</b> <ul style="list-style-type: none"> <li>Using the M-MDS, verify the following PID/DATA monitor. (See <a href="#">PID/DATA MONITOR TABLE</a>.) <ul style="list-style-type: none"> <li>RES_PT_P</li> </ul> </li> <li>Is the resistance of the passenger-side pre-tensioner seat belt normal? <ul style="list-style-type: none"> <li>Resistance: <b>1.3—4.7 ohms</b></li> </ul> </li> </ul>	Yes Replace the SAS control module.  (See <a href="#">SAS CONTROL MODULE REMOVAL/INSTALLATION</a> .)
		No Go to the next step.
2	<b>INSPECT PASSENGER SIDE PRE-TENSIONER SEAT BELT CONNECTOR</b> <p><b>WARNING:</b></p> <ul style="list-style-type: none"> <li>Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components. (See <a href="#">AIR BAG SYSTEM SERVICE WARNINGS</a>.) (See <a href="#">AIR BAG SYSTEM SERVICE CAUTIONS</a>.)</li> <li>Turn the ignition switch to the LOCK position.</li> <li>Remove the battery cover.</li> <li>Disconnect the negative battery cable and wait for <b>1 min or more</b>. (See <a href="#">BATTERY REMOVAL/INSTALLATION [LF]</a>.)</li> <li>Remove the back trim.</li> </ul>	Yes Replace the air bag wiring harness.
		No Go to the next step.

	<ul style="list-style-type: none"> <li>• Disconnect the passenger-side pre-tensioner seat belt connector.</li> <li>• Is there any malfunction of the passenger-side pre-tensioner seat belt connector?</li> </ul>		
3	<p><b>VERIFY WHETHER MALFUNCTION IS IN PASSENGER SIDE PRE-TENSIONER SEAT BELT OR RELATED WIRING HARNESS</b></p> <ul style="list-style-type: none"> <li>• Connect the leads of the <b>SST</b> (Fuel and thermometer checker) or apply <b>2-ohm</b> resistance to passenger-side pre-tensioner seat belt connector terminals A and B.</li> <li>• Set the resistance of the <b>SST</b> (Fuel and thermometer checker) to the <b>2-ohm</b> position.</li> <li>• Connect the negative battery cable.</li> <li>• Turn the ignition switch to the ON position.</li> <li>• Are DTCs B1881, B1882, B1883, and/or B1886 indicated?</li> </ul>	Yes	Go to the next step.
		No	<p>Replace the passenger-side pre-tensioner seat belt.</p> <p>(See <b>SEAT BELT REMOVAL/INSTALLATION</b>.)</p>
4	<p><b>INSPECT WIRING HARNESS BETWEEN PASSENGER SIDE PRE-TENSIONER SEAT BELT AND SAS CONTROL MODULE</b></p> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Remove the battery cover.</li> <li>• Disconnect the negative battery cable and wait for <b>1 min or more</b>.</li> </ul> <p>(See <b>BATTERY REMOVAL/INSTALLATION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>• Remove the column cover.</li> <li>• Disconnect the clock spring connector.</li> <li>• Remove the glove compartment.</li> <li>• Disconnect the passenger-side air bag module connector.</li> </ul> <p>(See <b>PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION</b>.)</p> <ul style="list-style-type: none"> <li>• Disconnect the driver and passenger-side seat connectors.</li> <li>• Remove the back trim.</li> <li>• Disconnect the driver and passenger-side pre-tensioner seat belt connectors.</li> <li>• Inspect the wiring harness between SAS control module terminal 2Y and passenger-side pre-tensioner seat belt terminal A, SAS control module terminal 2V and passenger-side pre-tensioner seat belt terminal B for the following: <ul style="list-style-type: none"> <li>▪ Short to ground</li> <li>▪ Short to power supply</li> <li>▪ Open circuit</li> </ul> </li> <li>• Is the wiring harness normal?</li> </ul>	Yes	<p>Replace the SAS control module.</p> <p>(See <b>SAS CONTROL MODULE REMOVAL/INSTALLATION</b>.)</p>
		No	Replace the air bag wiring harness.



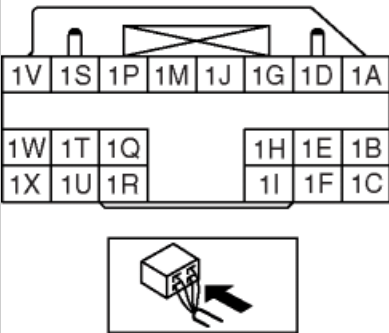


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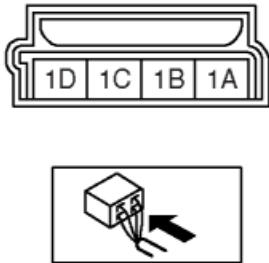
DTC B2228, B2230, B2232, B2234

DTC	B2228	Driver side air bag module (inflator No.2) circuit short to body ground
	B2230	Driver side air bag module (inflator No.2) circuit short to power supply
	B2232	Driver side air bag module (inflator No.2) circuit resistance high
	B2234	Driver side air bag module (inflator No.2) circuit resistance low
DETECTION CONDITION	<p><b>WARNING:</b></p> <ul style="list-style-type: none"><li>• Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.</li><li>• Resistance other than <b>1.5—4.7 ohms</b> detected in driver-side air bag module (inflator No.2) circuit</li><li>• Malfunction in wiring harness between driver-side air bag module (inflator No.2) and SAS control module</li></ul>	
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Open or short circuit in wiring harness between clock spring and SAS control module</li><li>• Clock spring malfunction</li><li>• Driver-side air bag module (inflator No.2) malfunction</li><li>• SAS control module malfunction</li></ul>	

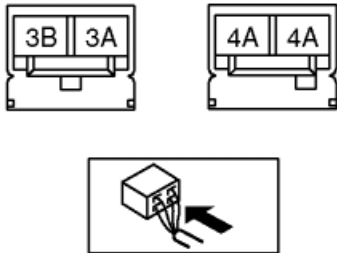
SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR



CLOCK SPRING WIRING HARNESS-SIDE CONNECTOR



DRIVER-SIDE AIR BAGMODULE WIRING HARNESS-SIDE CONNECTOR (CLOCK SPRING ) (INFLATOR NO. 1) (INFLATOR NO. 2)



Diagnostic procedure

STEP	INSPECTION	ACTION
1	<p><b>INSPECT DRIVER SIDE AIR BAG MODULE (INFLATOR NO.2)</b></p> <ul style="list-style-type: none"><li>Using the M-MDS, verify the following PID/DATA monitor. (See <a href="#">PID/DATA MONITOR TABLE</a>.)<ul style="list-style-type: none"><li>RES_AB2_D</li></ul></li><li>Is the resistance of the driver-side air bag module normal?</li></ul>	<p>Yes Replace the SAS control module.  (See <a href="#">SAS CONTROL MODULE REMOVAL/INSTALLATION</a>.)</p>

	<ul style="list-style-type: none"> <li>Resistance: <b>1.5—4.7 ohms</b></li> </ul>	No	Go to the next step.
2	<b>INSPECT DRIVER SIDE AIR BAG MODULE CONNECTOR (CLOCK SPRING)</b> <b>WARNING:</b> <ul style="list-style-type: none"> <li>Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the service warnings and cautions before handling the air bag system components.</li> <li>(See <a href="#">AIR BAG SYSTEM SERVICE WARNINGS.</a>)</li> <li>(See <a href="#">AIR BAG SYSTEM SERVICE CAUTIONS.</a>)</li> <li>Turn the ignition switch to the LOCK position.</li> <li>Remove the battery cover.</li> <li>Disconnect the negative battery cable and wait for <b>1 min or more.</b></li> <li>(See <a href="#">BATTERY REMOVAL/INSTALLATION [LF].</a>)</li> <li>Disconnect the driver-side air bag module connector.</li> <li>Is there any malfunction of the driver-side air bag module connector?</li> </ul>	Yes	Replace the air bag wiring harness.
		No	Go to the next step.
3	<b>VERIFY WHETHER MALFUNCTION IS IN DRIVER SIDE AIR BAG MODULE (INFLATOR NO.2) OR RELATED WIRING HARNESS</b> <ul style="list-style-type: none"> <li>Connect the leads of the <b>SST</b> (Fuel and thermometer checker) or apply <b>2-ohm</b> resistance to driver-side air bag module (inflator No.1) connector terminals 2A and 2B, and driver-side air bag module (inflator No.2) connector terminals 3A and 3B.</li> <li>Set the resistance of the <b>SST</b> (Fuel and thermometer checker) to the <b>2-ohm</b> position.</li> <li>Connect the negative battery cable.</li> <li>Turn the ignition switch to the ON position.</li> <li>Are DTCs B2228, B2230, B2232 and/or B2234 indicated?</li> </ul>	Yes	Go to the next step.
		No	Replace the driver-side air bag module.  (See <a href="#">DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.</a> )
4	<b>INSPECT CLOCK SPRING</b> <ul style="list-style-type: none"> <li>Inspect the clock spring.</li> <li>(See <a href="#">CLOCK SPRING INSPECTION.</a>)</li> <li>Is the clock spring normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the clock spring.  (See <a href="#">CLOCK SPRING REMOVAL/INSTALLATION.</a> )
5	<b>INSPECT WIRING HARNESS BETWEEN CLOCK SPRING AND SAS CONTROL MODULE</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Remove the battery cover.</li> <li>Disconnect the negative battery cable and wait for <b>1 min or more.</b></li> <li>(See <a href="#">BATTERY REMOVAL/INSTALLATION [LF].</a>)</li> <li>Remove the column cover.</li> <li>Disconnect the clock spring connector.</li> <li>Remove the glove compartment.</li> <li>Disconnect the passenger-side air bag module connector.</li> <li>(See <a href="#">PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.</a>)</li> <li>Disconnect the driver and passenger-side seat connectors.</li> <li>Remove the back trim.</li> <li>Disconnect the driver and passenger-side pre-tensioner seat belt connectors.</li> <li>Disconnect the SAS control module connector.</li> </ul>	Yes	Replace the SAS control module.  (See <a href="#">SAS CONTROL MODULE REMOVAL/INSTALLATION.</a> )
		No	Replace the air bag wiring harness.

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|  | <ul style="list-style-type: none"><li>• Inspect the wiring harness between SAS control module terminal 1G and clock spring terminal 1H, SAS control module terminal 1J and clock spring terminal 1F for the following:<ul style="list-style-type: none"><li>▪ Short to ground</li><li>▪ Short to power supply</li><li>▪ Open circuit</li></ul></li><li>• Is the wiring harness normal?</li></ul> |  |
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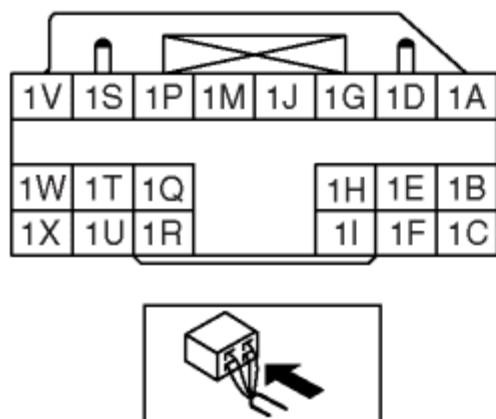
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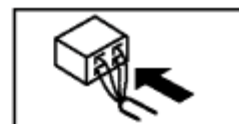
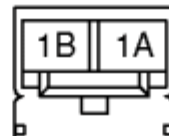
DTC B2229, B2231, B2233, B2235

DTC	B2229	Passenger side air bag module (inflator No.2) circuit short to body ground
	B2231	Passenger side air bag module (inflator No.2) circuit short to power supply
	B2233	Passenger side air bag module (inflator No.2) circuit resistance high
	B2235	Passenger side air bag module (inflator No.2) circuit resistance low
DETECTION CONDITION	<p><b>WARNING:</b></p> <ul style="list-style-type: none"><li>• Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.</li><li>• Resistance other than <b>1.3—4.7 ohms</b> detected in passenger-side side air bag module circuit</li><li>• Malfunction in wiring harness between passenger-side air bag module (inflator No.2) and SAS control module</li></ul>	
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Open or short circuit in wiring harness between passenger-side air bag module (inflator No.2) and SAS control module</li><li>• Passenger-side air bag module (inflator No.2) malfunction</li><li>• SAS control module malfunction</li></ul>	

## SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR



## PASSENGER-SIDE AIR BAG MODULE WIRING HARNESS-SIDE CONNECTOR (INFLATOR NO. 1) (INFLATOR NO. 2)



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT PASSENGER SIDE AIR BAG MODULE (INFLATOR NO.2)</b> <ul style="list-style-type: none"> <li>Using the M-MDS, verify the following PID/DATA monitor. (See <a href="#">PID/DATA MONITOR TABLE</a>.) <ul style="list-style-type: none"> <li>RES_AB2_P</li> </ul> </li> <li>Is the resistance of the passenger-side air bag module normal? <ul style="list-style-type: none"> <li>Resistance: <b>1.3—4.7 ohms</b></li> </ul> </li> </ul>	Yes Replace the SAS control module.  (See <a href="#">SAS CONTROL MODULE REMOVAL/INSTALLATION</a> .)
		No Go to the next step.
2	<b>INSPECT PASSENGER SIDE AIR BAG MODULE (INFLATOR NO.2) CONNECTOR</b>  <b>WARNING:</b> <ul style="list-style-type: none"> <li>Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components. (See <a href="#">AIR BAG SYSTEM SERVICE WARNINGS</a>.) (See <a href="#">AIR BAG SYSTEM SERVICE CAUTIONS</a>.)</li> <li>Turn the ignition switch to the LOCK position.</li> <li>Remove the battery cover.</li> <li>Disconnect the negative battery cable and wait for <b>1 min or more</b>. (See <a href="#">BATTERY REMOVAL/INSTALLATION [LF]</a>.)</li> </ul>	Yes Replace the air bag wiring harness.
		No Go to the next step.

	<ul style="list-style-type: none"><li>Remove the glove compartment.</li><li>Disconnect the passenger-side air bag module connector.</li></ul> <p>(See <b>PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.</b>)</p> <ul style="list-style-type: none"><li>Is there any malfunction of the passenger-side air bag module connector?</li></ul>		
3	<b>VERIFY WHETHER MALFUNCTION IS IN PASSENGER-SIDE AIR BAG MODULE (INFLATOR NO.2) OR RELATED WIRING HARNESS</b> <ul style="list-style-type: none"><li>Connect the leads of the <b>SST</b> (Fuel and thermometer checker) or apply <b>2-ohm</b> resistance to passenger-side air bag module (inflator No.1) connector terminals 1A and 1B, and passenger-side air bag module (inflator No.2) connector terminals 2A and 2B.</li><li>Set the resistance of the <b>SST</b> (Fuel and thermometer checker) to the <b>2-ohm</b> position.</li><li>Connect the negative battery cable.</li><li>Turn the ignition switch to the ON position.</li><li>Are DTCs B2229, B2231, B2233 and/or B2235 indicated?</li></ul>	Yes	Go to the next step.
		No	Replace the passenger-side air bag module.  (See <b>PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.</b> )
4	<b>INSPECT WIRING HARNESS BETWEEN PASSENGER-SIDE AIR BAG MODULE (INFLATOR NO.2) AND SAS CONTROL MODULE</b> <ul style="list-style-type: none"><li>Turn the ignition switch to the LOCK position.</li><li>Remove the battery cover.</li><li>Disconnect the negative battery cable and wait for <b>1 min or more</b>.</li></ul> <p>(See <b>BATTERY REMOVAL/INSTALLATION [LF].</b>)</p> <ul style="list-style-type: none"><li>Remove the column cover.</li><li>Disconnect the clock spring connector.</li><li>Remove the glove compartment.</li><li>Disconnect the passenger-side air bag module connector.</li></ul> <p>(See <b>PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.</b>)</p> <ul style="list-style-type: none"><li>Disconnect the driver and passenger-side seat connectors.</li><li>Remove the back trim.</li><li>Disconnect the driver and passenger-side pre-tensioner seat belt connectors.</li></ul>	Yes	Replace the SAS control module.  (See <b>SAS CONTROL MODULE REMOVAL/INSTALLATION.</b> )
		No	Replace the air bag wiring harness.

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| <ul style="list-style-type: none"><li>• Inspect the wiring harness between SAS control module terminal 1M and passenger-side air bag module terminal 2A, SAS control module terminal 1P and passenger-side air bag module terminal 2B for the following:<ul style="list-style-type: none"><li>▪ Short to ground</li><li>▪ Short to power supply</li><li>▪ Open circuit</li></ul></li><li>• Is the wiring harness normal?</li></ul> |  |
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DTC B2290

DTC B2290	Passenger sensing system malfunction
DETECTION CONDITION	<p><b>WARNING:</b></p> <ul style="list-style-type: none"><li>• Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.</li><li>• Passenger sensing system circuit malfunction</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Seat weight sensor control module connector malfunction</li><li>• Open or short circuit in the wiring harness between the battery and the seat weight sensor control module</li><li>• Open or short circuit in the wiring harness between the SAS control module and seat weight sensor control module</li><li>• Open circuit in the wiring harness between the seat weight sensor control module and body ground</li><li>• Seat weight sensor calibration not properly set</li><li>• Communication error between SAS control module and seat weight sensor control module</li><li>• Seat weight sensor control module internal malfunction</li><li>• LH or RH seat weight sensor malfunction</li><li>• SAS control module malfunction</li></ul>
<div>SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR<div></div></div> <div>SEAT WEIGHT SENSOR CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR<div></div></div> <div>SEAT WEIGHT SENSOR CONTROL MODULE<div></div></div>	

STEP	INSPECTION	ACTION
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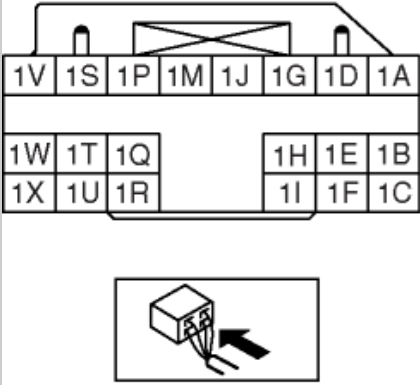
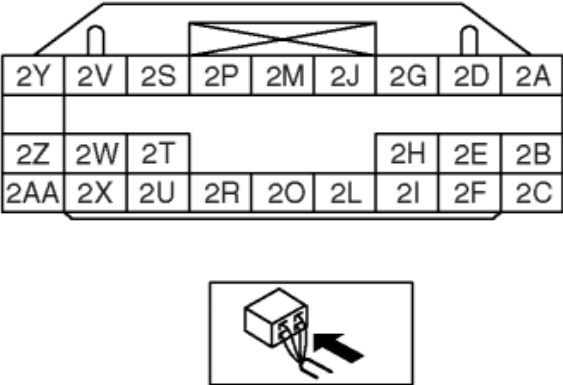
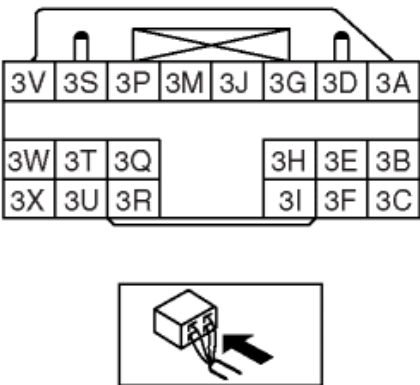
1	<p><b>INSPECT SEAT WEIGHT SENSOR CONTROL MODULE CONNECTOR</b></p> <p><b>WARNING:</b></p> <ul style="list-style-type: none"> <li>Handling the air bag system components improperly can accidentally operate (deploy) the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components.</li> </ul> <p>(See <b>AIR BAG SYSTEM SERVICE WARNINGS</b>.)</p> <p>(See <b>AIR BAG SYSTEM SERVICE CAUTIONS</b>.)</p> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Remove the battery cover.</li> <li>Disconnect the negative battery cable and wait for <b>1 min or more</b>.</li> </ul> <p>(See <b>BATTERY REMOVAL/INSTALLATION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>Disconnect the seat weight sensor control module connector.</li> <li>Inspect the seat weight sensor control module connector. (Corrosion, damage, and disconnected pins)</li> <li>Is there any malfunction of the seat weight sensor control module connector?</li> </ul>	<p>Yes Repair or replace the wiring harness.</p> <p>After replacement, reperform the DTC inspection and verify that no DTCs are displayed.</p> <p>No Go to the next step.</p>
2	<p><b>INSPECT SEAT WEIGHT SENSOR CONTROL MODULE POWER SUPPLY CIRCUIT</b></p> <ul style="list-style-type: none"> <li>Connect the negative battery cable.</li> <li>Turn the ignition switch to the ON position.</li> <li>Measure voltage at terminal 3A of seat weight sensor control module connector.</li> <li>Is voltage more than B+?</li> </ul>	<p>Yes Go to the next step.</p> <p>No If there is any malfunction in the wiring harnesses, repair or replace the applicable wiring harness.</p> <p>After replacement, reperform the DTC inspection and verify that no DTCs are displayed.</p>
3	<p><b>INSPECTION WIRING HARNESS</b></p> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Disconnect the negative battery cable and wait for <b>1 min or more</b>.</li> </ul> <p>(See <b>BATTERY REMOVAL/INSTALLATION [LF]</b>.)</p> <ul style="list-style-type: none"> <li>Disconnect the SAS control module connector. (See <b>SAS CONTROL MODULE REMOVAL/INSTALLATION</b>.)</li> <li>Verify continuity in the following wiring</li> </ul>	<p>Yes Go to the next step.</p> <p>No If there is any malfunction in the wiring harnesses, repair or replace the applicable wiring harness.</p> <p>After replacement, reperform the DTC inspection and verify that no DTCs are displayed.</p>

	<p>harnesses:</p> <ul style="list-style-type: none"><li>▪ Between SAS control module terminal 3B and seat weight sensor control module terminal 3D</li><li>▪ Between seat weight sensor control module terminal 3B and body ground</li></ul> <p>• Is the continuity normal?</p>		
4	<p><b>INSPECT PASSENGER SENSING SYSTEM</b></p> <ul style="list-style-type: none"><li>• Connect the seat weight sensor control module connector.</li><li>• Connect the SAS control module connector.</li><li>• Connect the negative battery cable.</li><li>• Turn the ignition switch to the ON position.</li><li>• Verify the following PIDs using the M-MDS. (See <b>PID/DATA MONITOR DISPLAY</b>.)</li><li>▪ OCSFLT_CAL</li><li>▪ OCSFLT_COM</li><li>▪ OCSFLT_L</li><li>▪ OCSFLT_MDL</li><li>▪ OCSFLT_R</li><li>▪ OCSFLT_SNS</li></ul> <p>• Do all PIDs display “OK”?</p>	<p>YesGo to the Step 6.</p> <p>NoPerform the following procedures according to the M-MDS screen indication:</p> <ul style="list-style-type: none"><li>• If FAULT is displayed for OCSFLT_CAL:<ul style="list-style-type: none"><li>▪ Perform the seat weight sensor calibration. (See <b>SEAT WEIGHT SENSOR CALIBRATION</b>.)</li></ul></li><li>• If FAULT is displayed for OCSFLT_COM or OCSFLT_MDL:<ul style="list-style-type: none"><li>▪ Replace the seat weight sensor control module. (See <b>SEAT WEIGHT SENSOR CONTROL MODULE REMOVAL/INSTALLATION</b>.)</li></ul></li><li>• If FAULT is displayed for OCSFLT_L or OCSFLT_R:<ul style="list-style-type: none"><li>▪ Go to the next step.</li></ul></li><li>• If FAULT is displayed for OCSFLT_SNS:<ul style="list-style-type: none"><li>▪ Go to the next step.</li></ul></li></ul>	
5	<p><b>INSPECT SEAT WEIGHT SENSOR CONTROL MODULE</b></p> <ul style="list-style-type: none"><li>• Turn the ignition switch to the LOCK position.</li><li>• Disconnect the negative battery cable and wait for <b>1 min or more</b>. (See <b>BATTERY REMOVAL/INSTALLATION [LF]</b>.)</li><li>• Disconnect the seat weight sensor connector from the seat weight sensor control module.</li><li>• Connect the negative battery cable.</li><li>• Turn the ignition switch to the ON position.</li><li>• Measure the voltage between the following terminals:</li></ul> <p><b>CAUTION:</b></p>	<p>YesReplace the seat weight sensor control module, then go to the next step.  (See <b>SEAT WEIGHT SENSOR CONTROL MODULE REMOVAL/INSTALLATION</b>.)</p> <p>No</p> <ul style="list-style-type: none"><li>• Replace the seat frame. (See <b>SEAT DISASSEMBLY/ASSEMBLY</b>.)</li><li>• Perform the DTC inspection again.<ul style="list-style-type: none"><li>▪ If the same DTC is displayed, replace the seat weight sensor control module, then go to the next step. (See <b>SEAT WEIGHT SENSOR CONTROL MODULE REMOVAL/INSTALLATION</b>.)</li></ul></li></ul>	

	<ul style="list-style-type: none"> <li>• When measuring the voltage at a terminal of the seat weight sensor control module, measure it being careful not to bend or damage the terminal.</li> <li>▪ Seat weight sensor control module terminal 1A (module side) and body ground</li> <li>▪ Seat weight sensor control module terminal 2A (module side) and body ground</li> </ul> <ul style="list-style-type: none"> <li>• Is the voltage <b>approx. 0 V</b>?</li> </ul>		
6	<b>INSPECT SAS CONTROL MODULE</b> <ul style="list-style-type: none"> <li>• Reperform the DTC inspection.</li> <li>• Is DTC B2290 indicated?</li> </ul>	Yes Replace the SAS control module. (See <b>SAS CONTROL MODULE REMOVAL/INSTALLATION.</b> )	
		No DTC troubleshooting completed.	

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DTC B2867

DTC B2867	Poor connection of any SAS control module connectors
DETECTION CONDITION	<p><b>WARNING:</b></p> <ul style="list-style-type: none"><li>Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.</li><li>There is no continuity between the poor connection detector bar terminals of the SAS control module.</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Poor connection of any SAS control module connectors</li><li>Malfunction of any SAS control module connectors</li><li>SAS control module malfunction</li></ul>
<p>SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR</p> <div></div> <div></div> <div></div>	

Diagnostic procedure

STEP	INSPECTION	ACTION
1	<p><b>VERIFY THAT ALL SAS CONTROL MODULE CONNECTORS ARE CONNECTED WITH SAS CONTROL MODULE</b></p> <p><b>WARNING:</b></p> <ul style="list-style-type: none"><li>Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components.</li></ul> <p>(See <b>AIR BAG SYSTEM SERVICE WARNINGS.</b>)</p>	<p>Yes Go to the next step.</p> <p>No Reconnect the connector properly.</p>

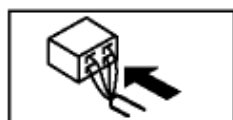
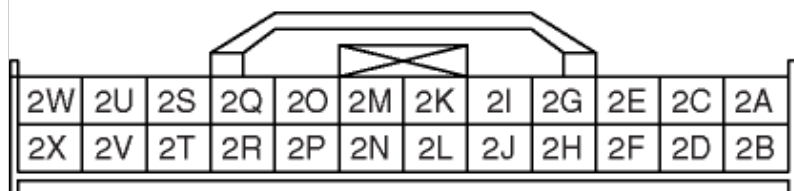
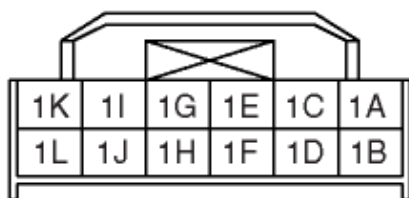
	<p>(See <b>AIR BAG SYSTEM SERVICE CAUTIONS.</b>)</p> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Remove the battery cover.</li> <li>• Disconnect the negative battery cable and wait for <b>1 min or more.</b></li> </ul> <p>(See <b>BATTERY REMOVAL/INSTALLATION [LF].</b>)</p> <ul style="list-style-type: none"> <li>• Are all SAS control module connectors securely connected?</li> </ul>		
2	<p><b>INSPECT ALL SAS CONTROL MODULE CONNECTORS</b></p> <ul style="list-style-type: none"> <li>• Remove the column cover.</li> <li>• Disconnect the clock spring connector.</li> <li>• Remove the glove compartment.</li> <li>• Disconnect the passenger-side air bag module connector.</li> </ul> <p>(See <b>PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.</b>)</p> <ul style="list-style-type: none"> <li>• Disconnect the driver and passenger-side seat connectors.</li> <li>• Remove the back trim.</li> <li>• Disconnect the driver and passenger-side pre-tensioner seat belt connectors.</li> <li>• Disconnect the SAS control module connector.</li> <li>• Are the poor connection detector bars of SAS control module connectors normal?</li> </ul>	<p>Yes Replace the SAS control module.</p> <p>(See <b>SAS CONTROL MODULE REMOVAL/INSTALLATION.</b>)</p>	<p>No Replace the air bag wiring harness.</p>

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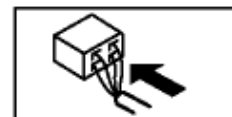
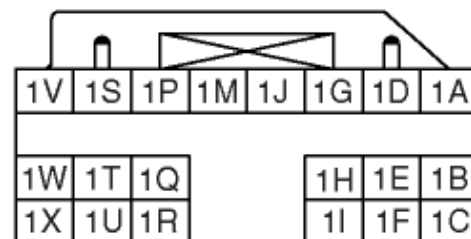
DTC B1869

DTC	B1869	<ul style="list-style-type: none"><li>Air bag system warning light circuit open (the air bag system warning light is continuously illuminated.)</li><li>Air bag system warning light circuit short to body ground (the air bag system warning light is never illuminated.)</li></ul>
DETECTION CONDITION		<p><b>WARNING:</b></p> <ul style="list-style-type: none"><li>Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.</li><li>Malfunction in the air bag system warning light circuit</li></ul>
POSSIBLE CAUSE		<ul style="list-style-type: none"><li>Instrument cluster malfunction</li><li>Malfunction of the connectors between the instrument cluster and SAS control module</li><li>Open or short circuit in the wiring harness between the battery and the instrument cluster</li><li>Open or short circuit in the wiring harness between the instrument cluster and SAS control module</li><li>SAS control module malfunction</li></ul>

## INSTRUMENT CLUSTER WIRING HARNESS-SIDE CONNECTOR



## SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT FOR CONTINUITY BETWEEN BATTERY FUSE AND INSTRUMENT CLUSTER</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the ON position.</li> <li>Measure the voltage at instrument cluster connector terminal 2K.</li> <li>Is the voltage <b>9 V or more</b>?</li> </ul>	Yes Go to the next step.
		No Repair the related wiring harness.
2	<b>INSPECT WIRING HARNESS BETWEEN INSTRUMENT CLUSTER AND SAS CONTROL MODULE</b> <p><b>WARNING:</b></p> <ul style="list-style-type: none"> <li>Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components.</li> <li>(See <a href="#">AIR BAG SYSTEM SERVICE WARNINGS</a>.)</li> <li>(See <a href="#">AIR BAG SYSTEM SERVICE CAUTIONS</a>.)</li> <li>Turn the ignition switch to the LOCK position.</li> <li>Remove the battery cover.</li> <li>Disconnect the negative battery cable and wait for <b>1 min or more</b>.</li> <li>(See <a href="#">BATTERY REMOVAL/INSTALLATION [LF]</a>.)</li> <li>Remove the column cover.</li> </ul>	Yes Go to the next step.
		No Replace the air bag wiring harness.

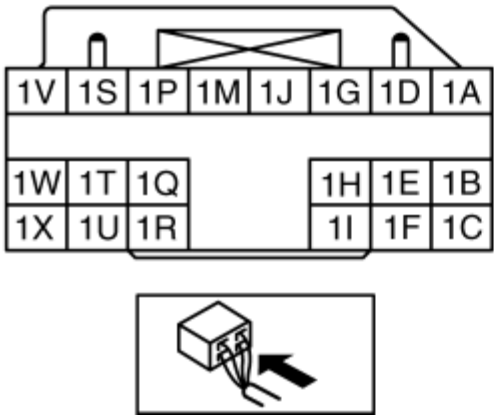
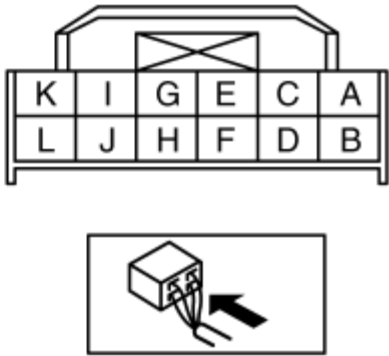
	<ul style="list-style-type: none"><li>• Disconnect the clock spring connector.</li><li>• Remove the glove compartment.</li><li>• Disconnect the passenger-side air bag module connector.  (See <b>PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.</b>)</li><li>• Disconnect the driver and passenger-side seat connectors.</li><li>• Remove the back trim.</li><li>• Disconnect the driver and passenger-side pre-tensioner seat belt connectors.</li><li>• Disconnect the SAS control module connector.</li><li>• Disconnect the instrument cluster connector.</li><li>• Inspect the wiring harness between SAS control module terminal 1R and instrument cluster terminal 2K for the following:<ul style="list-style-type: none"><li>▪ Short to ground</li><li>▪ Short to power supply</li><li>▪ Open circuit</li></ul></li><li>• Is the wiring harness normal?</li></ul>		
4	<b>INSPECT AIR BAG SYSTEM WARNING LIGHT</b> <ul style="list-style-type: none"><li>• Connect the instrument cluster connector.</li><li>• Turn the ignition switch to the ON position.</li><li>• Does the air bag system warning light illuminate?</li></ul>	Yes	Go to the next step.
		No	Replace the instrument cluster.  (See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION.</b> )
5	<b>INSPECT AIR BAG SYSTEM WARNING LIGHT</b> <ul style="list-style-type: none"><li>• Ground instrument cluster connector terminal 1E to the body using a jumper wire.</li><li>• Does the air bag system warning light go out?</li></ul>	Yes	Replace the SAS control module.  (See <b>SAS CONTROL MODULE REMOVAL/INSTALLATION.</b> )
		No	Replace the instrument cluster.  (See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION.</b> )





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DTC B1884

DTC B1884	Passenger air bag deactivation (PAD) indicator circuit open or short to body ground
DETECTION CONDITION	<p><b>WARNING:</b></p> <ul style="list-style-type: none"><li>Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.</li><li>Malfunction in PAD indicator circuit</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Open or short circuit in wiring harness between PAD indicator and SAS control module</li><li>Open circuit in wiring harness between battery and PAD indicator</li><li>PAD indicator malfunction</li><li>SAS control module malfunction</li></ul>
<div><div>SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR</div></div> <div><div>PAD INDICATOR WIRING HARNESS-SIDE CONNECTOR</div></div>	

Diagnostic procedure

STEP	INSPECTION	ACTION
	INSPECT OPERATION OF PAD INDICATOR	

1	<ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position.</li> <li>• Does the PAD indicator illuminate?</li> </ul>	Yes	Go to the next step.
		No	Go to Step 6.
2	<b>INSPECT FUSE</b> <ul style="list-style-type: none"> <li>• Remove the ENGINE 15 A fuse.</li> <li>• Is the fuse normal?</li> </ul>	Yes	Install the fuse, then go to the next step.
		No	Replace the fuse.
3	<b>INSPECT BATTERY</b> <ul style="list-style-type: none"> <li>• Measure the battery positive voltage.</li> <li>• Is the voltage <b>9 V—16 V</b>?</li> </ul>	Yes	Go to the next step.
		No	Battery is malfunctioning Inspect the charge/discharge system.
4	<b>INSPECT WIRING HARNESS BETWEEN BATTERY AND PAD INDICATOR</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position.</li> <li>• Measure the PAD indicator terminal B voltage.</li> <li>• Is the voltage <b>9 V or more</b>?</li> </ul>	Yes	Go to the next step.
		No	Repair the wiring harness between the battery and PAD indicator.
5	<b>INSPECT PAD INDICATOR</b> <ul style="list-style-type: none"> <li>• Ground PAD indicator connector terminal G using a jumper wire.</li> <li>• Turn the ignition switch to the ON position.</li> <li>• Does the PAD indicator illuminate?</li> </ul>	Yes	Go to the next step.
		No	Replace the PAD indicator.  (See <b>PASSENGER AIR BAG DEACTIVATION (PAD) INDICATOR REMOVAL/INSTALLATION.</b> )
6	<b>INSPECT WIRING HARNESS BETWEEN PAD INDICATOR AND SAS CONTROL MODULE</b>  <b>WARNING:</b> <ul style="list-style-type: none"> <li>• Handling the air bag system components improperly can accidentally deploy the air bag modules and pretensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components.  (See <b>AIR BAG SYSTEM SERVICE WARNINGS.</b>) (See <b>AIR BAG SYSTEM SERVICE CAUTIONS.</b>)</li> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Remove the battery cover.</li> <li>• Disconnect the negative battery cable and wait for <b>1 min or more</b>.</li> </ul>	Yes	Replace the SAS control module.  (See <b>SAS CONTROL MODULE REMOVAL/INSTALLATION.</b> )
		No	Replace the air bag wiring harness.

(See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)

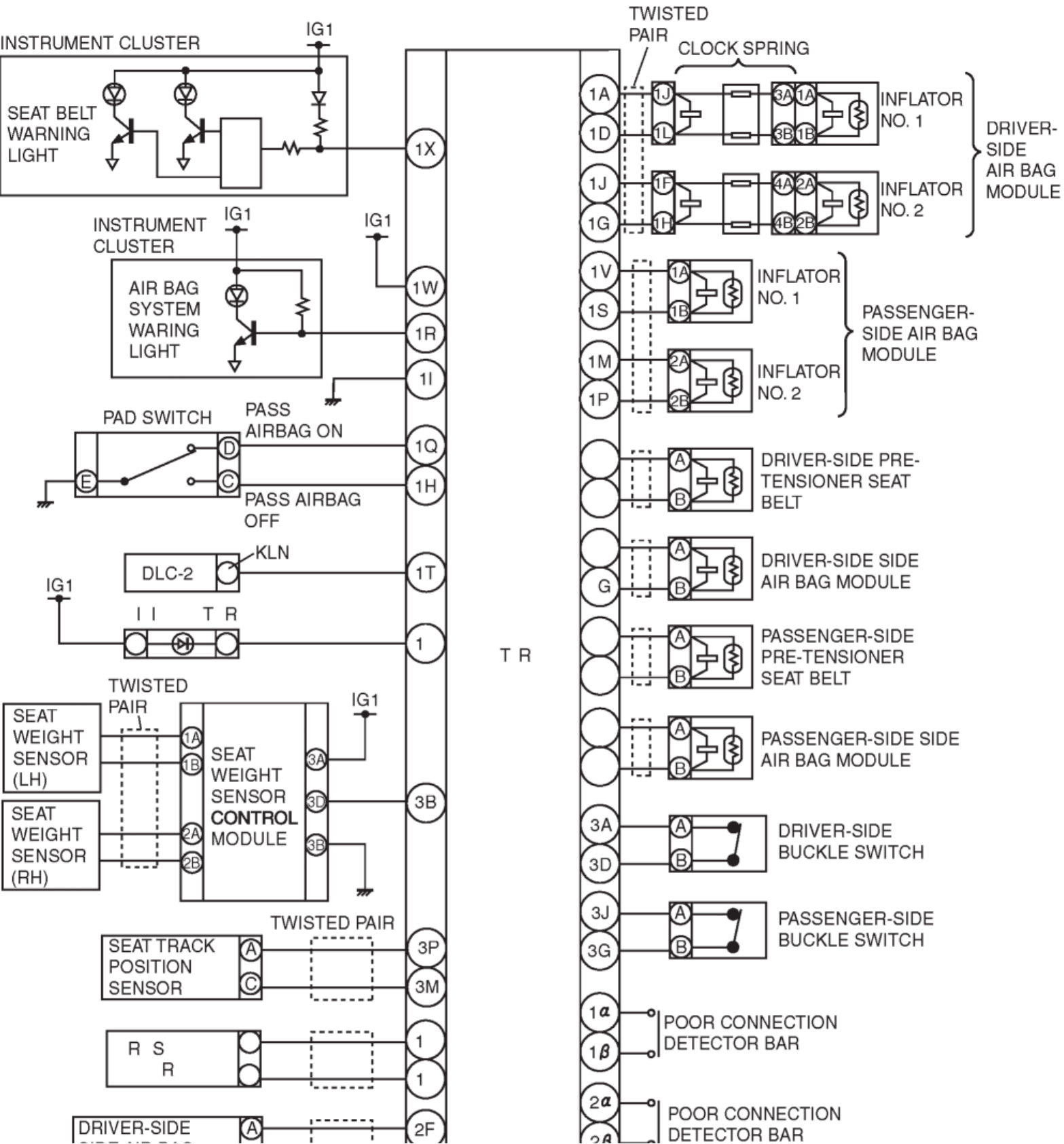
- Remove the column cover.
- Disconnect the clock spring connector.
- Remove the glove compartment.
- Disconnect the passenger-side air bag module connector.

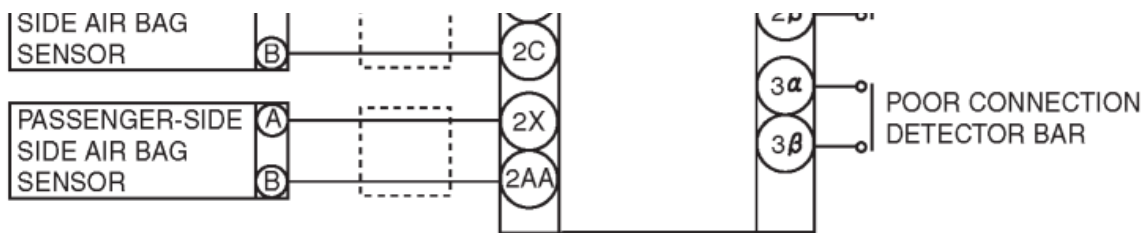
(See [PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION](#).)

- Disconnect the driver and passenger-side seat connectors.
- Remove the back trim.
- Disconnect the driver and passenger-side pre-tensioner seat belt.
- Disconnect the SAS control module connector.
- Inspect the wiring harness between PAD indicator terminal G and SAS control module terminal 1U for the following:
  - Short to ground
  - Short to power supply
  - Open circuit
- Is the wiring harness normal?

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AIR BAG SYSTEM WIRING DIAGRAM (ON-BOARD DIAGNOSTIC)





1V	1S	1P	1M	1J	1G	1D	1A
1W	1T	1Q			1H	1E	1B
1X	1U	1R			1I	1F	1C

2Y	2V	2S	2P	2M	2J	2G	2D	2A
2Z	2W	2T				2H	2E	2B
2AA	2X	2U	2R	2O	2L	2I	2F	2C

3V	3S	3P	3M	3J	3G	3D	3A	
3W	3T	3Q				3H	3E	3B
3X	3U	3R				3I	3F	3C



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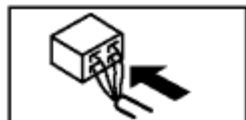
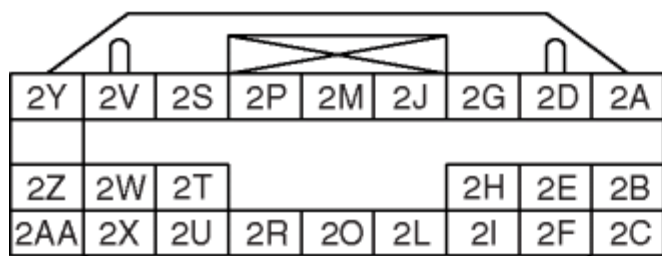
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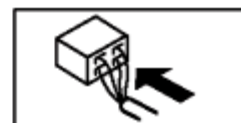
DTC B1047, B1992, B1993, B1994, B1995

DTC	B1047	Driver   side side air bag module assembly incorrect
	B1992	Driver   side side air bag module circuit short to power supply
	B1993	Driver   side side air bag module circuit short to body ground
	B1994	Driver   side side air bag module circuit resistance high
	B1995	Driver   side side air bag module circuit resistance low
DETECTION CONDITION		<p><b>WARNING:</b></p> <ul style="list-style-type: none"><li>• Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.</li><li>• Resistance other than <b>1.3—4.7 ohms</b> detected in driver-side side air bag module circuit</li><li>• Malfunction in wiring harness between driver-side side air bag module and SAS control module</li></ul>
POSSIBLE CAUSE		<ul style="list-style-type: none"><li>• Open or short circuit in wiring harness between driver-side side air bag module and SAS control module</li><li>• Driver-side side air bag module malfunction</li><li>• SAS control module malfunction</li></ul>

## SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR



## DRIVER-SIDE SIDE AIR BAG MODULE WIRING HARNESS-SIDE CONNECTOR



### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT DRIVER-SIDE SIDE AIR BAG MODULE</b> <ul style="list-style-type: none"> <li>Using the M-MDS, verify the following PID/DATA monitor. (See <a href="#">PID/DATA MONITOR TABLE</a>.) <ul style="list-style-type: none"> <li>RES_SAB_D</li> </ul> </li> <li>Is the resistance of the driver-side side air bag module normal? <ul style="list-style-type: none"> <li>Resistance: <b>1.3—4.7 ohms</b></li> </ul> </li> </ul>	Yes Replace the SAS control module.  (See <a href="#">SAS CONTROL MODULE REMOVAL/INSTALLATION</a> .)
		No Go to the next step.
2	<b>INSPECT DRIVER SIDE SIDE AIR BAG MODULE CONNECTOR</b> <b>WARNING:</b> <ul style="list-style-type: none"> <li>Handling the air bag system components improperly can accidentally deploy the air bag modules and pretensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components. (See <a href="#">AIR BAG SYSTEM SERVICE WARNINGS</a>.) (See <a href="#">AIR BAG SYSTEM SERVICE CAUTIONS</a>.)</li> <li>Turn the ignition switch to the LOCK position.</li> <li>Remove the battery cover.</li> <li>Disconnect the negative battery cable and wait for <b>1 min or more</b>. (See <a href="#">BATTERY REMOVAL/INSTALLATION [LF]</a>.)</li> </ul>	Yes Replace the air bag wiring harness.
		No Go to the next step.



	<ul style="list-style-type: none"><li>• Disconnect the driver-side side air bag module connector.</li><li>• Is there any malfunction of the driver-side side air bag module connector?</li></ul>		
3	<b>VERIFY WHETHER MALFUNCTION IS IN DRIVER SIDE SIDE AIR BAG MODULE OR RELATED WIRING HARNESS</b> <ul style="list-style-type: none"><li>• Connect the leads of the <b>SST</b> (Fuel and thermometer checker) or apply <b>2-ohm</b> resistance to driver-side side air bag module connector terminals A and B.</li><li>• Set the resistance of the <b>SST</b> (Fuel and thermometer checker) to the <b>2-ohm</b> position.</li><li>• Connect the negative battery cable.</li><li>• Turn the ignition switch to the ON position.</li><li>• Are DTCs B1047, B1992, B1993, B1994, and/or B1995 indicated?</li></ul>	Yes	Go to the next step.
		No	Replace the driver-side side air bag module.  (See <b>SIDE AIR BAG MODULE REMOVAL/INSTALLATION.</b> )
4	<b>INSPECT WIRING HARNESS BETWEEN DRIVER-SIDE SIDE AIR BAG MODULE AND SAS CONTROL MODULE</b> <ul style="list-style-type: none"><li>• Turn the ignition switch to the LOCK position.</li><li>• Remove the battery cover.</li><li>• Disconnect the negative battery cable and wait for <b>1 min or more</b>.  (See <b>BATTERY REMOVAL/INSTALLATION [LF]</b>.)</li><li>• Disconnect the driver-side air bag module connector.</li><li>• Remove the glove compartment.</li><li>• Disconnect the passenger-side air bag module connector.  (See <b>PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.</b>)</li><li>• Disconnect the driver and passenger-side seat connectors.</li><li>• Remove the back trim.</li><li>• Disconnect the driver and passenger-side pre-tensioner seat belt connectors.</li><li>• Inspect the wiring harness between SAS control module terminal 2J and driver-side side air bag module terminal A, SAS control module terminal 2G and driver-side side air bag module terminal B for the following:<ul style="list-style-type: none"><li>▪ Short to ground</li><li>▪ Short to power supply</li></ul></li></ul>	Yes	Replace the SAS control module.  (See <b>SAS CONTROL MODULE REMOVAL/INSTALLATION.</b> )
		No	Replace the air bag wiring harness.

- Open circuit

- Is the wiring harness normal?

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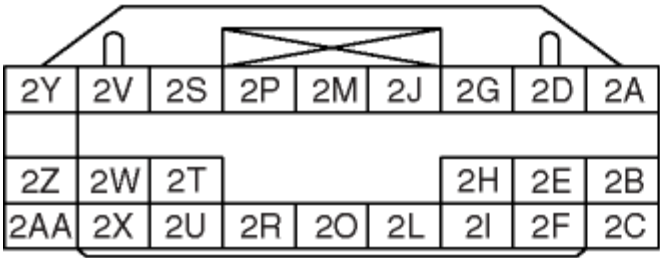
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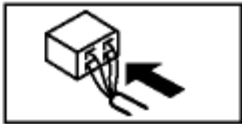
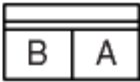
DTC B1055, B1996, B1997, B1998, B1999

DTC	B1055	Passenger	side	side	air bag module assembly incorrect
	B1996	Passenger	side	side	air bag module circuit short to power supply
	B1997	Passenger	side	side	air bag module circuit short to body ground
	B1998	Passenger	side	side	air bag module circuit resistance high
	B1999	Passenger	side	side	air bag module circuit resistance low
DETECTION CONDITION		<b>WARNING:</b> <ul style="list-style-type: none"><li>• Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.</li><li>• Resistance other than <b>1.3—4.7 ohms</b> detected in passenger-side side air bag module circuit</li><li>• Malfunction in wiring harness between passenger-side side air bag module and SAS control module</li></ul>			
POSSIBLE CAUSE		<ul style="list-style-type: none"><li>• Open or short circuit in wiring harness between passenger-side side air bag module and SAS control module</li><li>• Passenger-side side air bag module malfunction</li><li>• SAS control module malfunction</li></ul>			

SAS CONTROL MODULE WIRING  
HARNESS-SIDE CONNECTOR



PASSENGER-SIDE SIDE AIR BAG MODULE  
WIRING HARNESS-SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>INSPECT PASSENGER-SIDE SIDE AIR BAG MODULE</b> <ul style="list-style-type: none"><li>Using the M-MDS, verify the following PID/DATA monitor. (See <b>PID/DATA MONITOR TABLE</b>.)<ul style="list-style-type: none"><li>RES_SAB_P</li></ul></li><li>Is the resistance of the passenger-side side air bag module normal?<ul style="list-style-type: none"><li>Resistance: <b>1.3—4.7 ohms</b></li></ul></li></ul>	Yes	Replace the SAS control module.  (See <b>SAS CONTROL MODULE REMOVAL/INSTALLATION</b> .)
		No	Go to the next step.
2	<b>INSPECT PASSENGER SIDE SIDE AIR BAG MODULE CONNECTOR</b> <b>WARNING:</b> <ul style="list-style-type: none"><li>Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components. (See <b>AIR BAG SYSTEM SERVICE WARNINGS</b>.) (See <b>AIR BAG SYSTEM SERVICE CAUTIONS</b>.)</li><li>Turn the ignition switch to the LOCK position.</li><li>Remove the battery cover.</li><li>Disconnect the negative battery cable and wait for <b>1 min or more</b>. (See <b>BATTERY REMOVAL/INSTALLATION [LF]</b>.)</li></ul>	Yes	Replace the air bag wiring harness.
		No	Go to the next step.

	<ul style="list-style-type: none"><li>• Disconnect the passenger-side side air bag module connector.</li><li>• Is there any malfunction of the passenger-side side air bag module connector?</li></ul>		
3	<b>VERIFY WHETHER MALFUNCTION IS IN PASSENGER SIDE SIDE AIR BAG MODULE OR RELATED WIRING HARNESS</b> <ul style="list-style-type: none"><li>• Connect the leads of the <b>SST</b> (Fuel and thermometer checker) or apply <b>2-ohm</b> resistance to passenger-side side air bag module connector terminals A and B.</li><li>• Set the resistance of the <b>SST</b> (Fuel and thermometer checker) to the <b>2-ohm</b> position.</li><li>• Connect the negative battery cable.</li><li>• Turn the ignition switch to the ON position.</li><li>• Are DTCs B1055, B1996, B1997, B1998 and/or B1999 indicated?</li></ul>	Yes	Go to the next step.
		No	Replace the passenger-side side air bag module.  (See <b>SIDE AIR BAG MODULE REMOVAL/INSTALLATION.</b> )
4	<b>INSPECT WIRING HARNESS BETWEEN PASSENGER-SIDE SIDE AIR BAG MODULE AND SAS CONTROL MODULE</b> <ul style="list-style-type: none"><li>• Turn the ignition switch to the LOCK position.</li><li>• Remove the battery cover.</li><li>• Disconnect the negative battery cable and wait for <b>1 min or more</b>.  (See <b>BATTERY REMOVAL/INSTALLATION [LF].</b>)</li><li>• Remove the column cover.</li><li>• Disconnect the clock spring connector.</li><li>• Remove the glove compartment.</li><li>• Disconnect the passenger-side air bag module connector.  (See <b>PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.</b>)</li><li>• Disconnect the driver and passenger-side seat connectors.</li><li>• Remove the back trim.</li><li>• Disconnect the driver and passenger-side pre-tensioner seat belt connectors.</li><li>• Inspect the wiring harness between SAS control module terminal 2P and passenger-side side air bag module terminal A, SAS control module terminal 2S and passenger-side side air bag module terminal B for the following:<ul style="list-style-type: none"><li>▪ Short to ground</li></ul></li></ul>	Yes	Replace the SAS control module.  (See <b>SAS CONTROL MODULE REMOVAL/INSTALLATION.</b> )
		No	Replace the air bag wiring harness.

- |  |  |  |
|--|--|--|
|  | <ul style="list-style-type: none"><li>▪ Short to power supply</li><li>▪ Open circuit</li></ul> <ul style="list-style-type: none"><li>• Is the wiring harness normal?</li></ul> |  |
|--|--|--|

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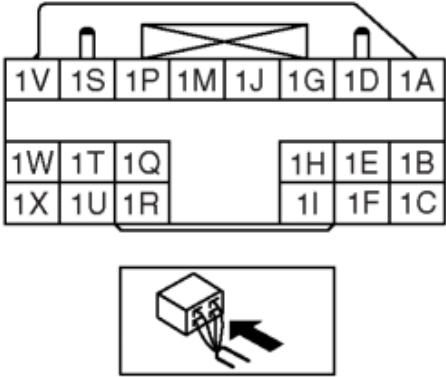
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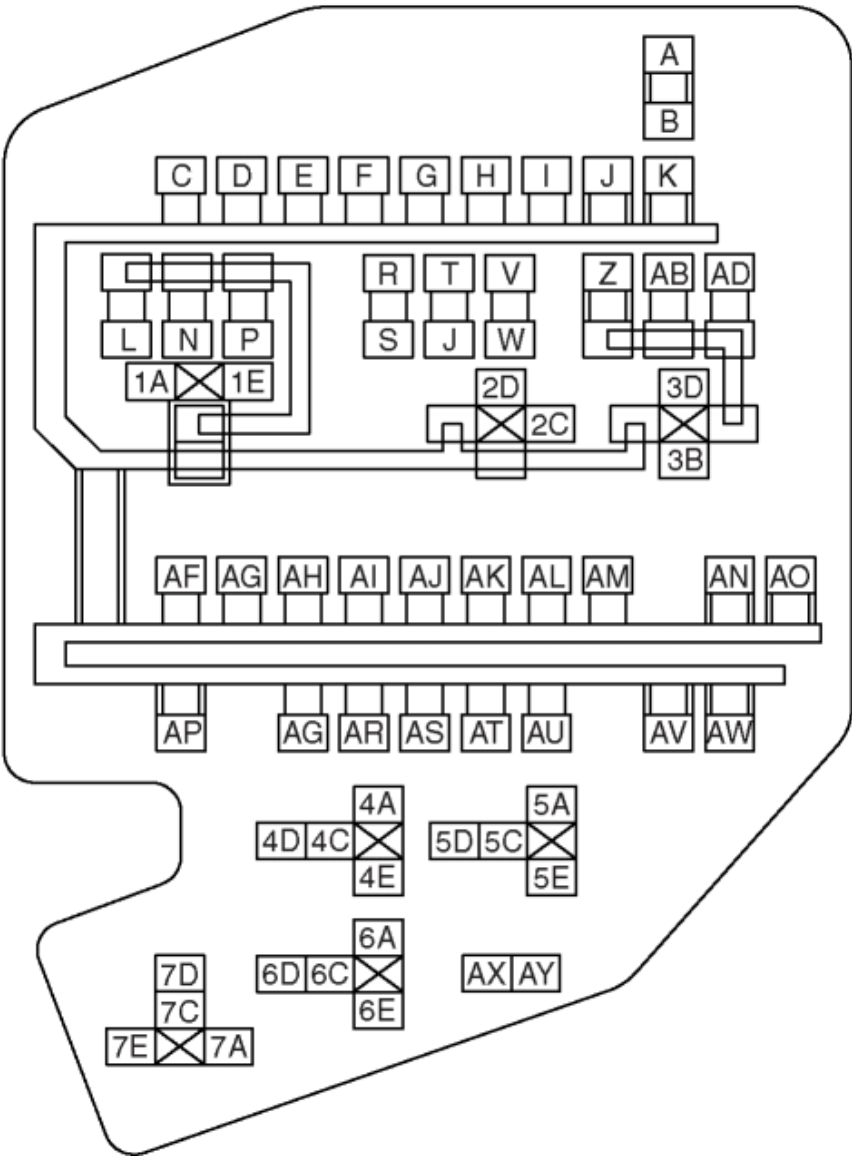
DTC B1318

DTC	B1318	The power supply voltage decreases (less than 9 V)
DETECTION CONDITION	<p><b>WARNING:</b></p> <ul style="list-style-type: none"><li>• Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection with only detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.</li><li>• When the SAS control module power supply voltage is not <b>within 9—16 V</b>.</li></ul>	
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Open or short circuit in wiring harness between battery and SAS control module</li><li>• ENGINE 15 A fuse malfunction</li><li>• Battery malfunction</li><li>• SAS control module malfunction</li></ul>	

SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR



MAIN FUSE BLOCK



Diagnostic procedure

Step	Inspection	Action
1	<b>INSPECT FUSE</b> <ul style="list-style-type: none"><li>Remove the ENGINE 15 A fuse.</li><li>Is the fuse normal?</li></ul>	YesGo to the next step.
		No Replace the fuse.
2	<b>INSPECT BATTERY</b> <ul style="list-style-type: none"><li>Measure the battery positive voltage.</li><li>Is the voltage <b>9 V–16 V</b>?</li></ul>	YesGo to the next step.
		No The battery has a malfunction.  Inspect the charge/discharge system.
3	<b>INSPECT WIRING HARNESS BETWEEN BATTERY AND FUSE BLOCK</b>	YesInstall the fuse, then go



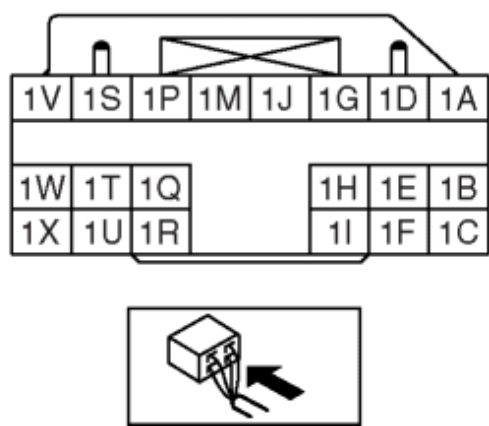
	<p>Turn the ignition switch to the ON position.</p> <ul style="list-style-type: none"> <li>• Measure the main fuse block terminal AB voltage.</li> <li>• Is the voltage <b>9 V–16 V</b>?</li> </ul>	<p>to the next step.</p>
4	<p><b>INSPECT MAIN FUSE BLOCK</b></p> <p><b>WARNING:</b></p> <ul style="list-style-type: none"> <li>• Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components.</li> </ul> <p>(See <a href="#">AIR BAG SYSTEM SERVICE WARNINGS</a>.)</p> <p>(See <a href="#">AIR BAG SYSTEM SERVICE CAUTIONS</a>.)</p> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Remove the battery cover.</li> <li>• Disconnect the negative battery cable and wait for <b>1 min or more</b>.</li> </ul> <p>(See <a href="#">BATTERY REMOVAL/INSTALLATION [LF]</a>.)</p> <ul style="list-style-type: none"> <li>• Remove the column cover.</li> <li>• Disconnect the clock spring connector.</li> <li>• Remove the glove compartment.</li> <li>• Disconnect the passenger-side air bag module connector.</li> </ul> <p>(See <a href="#">PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION</a>.)</p> <ul style="list-style-type: none"> <li>• Disconnect the driver and passenger-side seat connector.</li> <li>• Remove the back trim.</li> <li>• Disconnect the driver and passenger-side pre-tensioner seat belt connectors.</li> <li>• Disconnect the SAS control module connector.</li> <li>• Turn the ignition switch to the ON position.</li> <li>• Measure the SAS control module terminal 1W voltage.</li> <li>• Is the voltage <b>9 V–16 V</b>?</li> </ul>	<p>Yes Replace the SAS control module.</p> <p>(See <a href="#">SAS CONTROL MODULE REMOVAL/INSTALLATION</a>.)</p> <p>No Repair the wiring harness between the main fuse block and SAS control module.</p>

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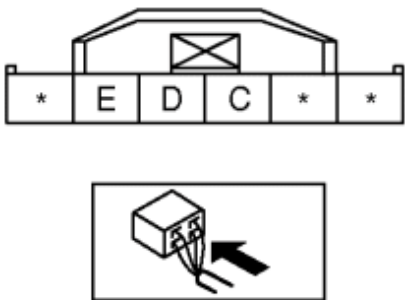
DTC B1871

DTC B1871	Passenger air bag deactivation (PAD) switch system circuit disabled
DETECTION CONDITION	<p><b>WARNING:</b></p> <ul style="list-style-type: none"><li>• Detection conditions are for understanding DTC outline before performing inspection. Performing inspection with only detection conditions may cause injury due to operating error or damage the system. When performing inspection, always follow inspection procedure.</li><li>• Malfunction in wiring harness between PAD switch and SAS control module</li><li>• Malfunction in PAD switch circuit</li></ul>
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Open or short circuit in wiring harness between PAD switch and SAS control module</li><li>• PAD switch circuit malfunction</li><li>• SAS control module malfunction</li><li>• PAD switch assembly incorrect</li></ul>

SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR



PASSENGER AIR BAG DEACTIVATION (PAD) SWITCH WIRING HARNESS-SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION	ACTION

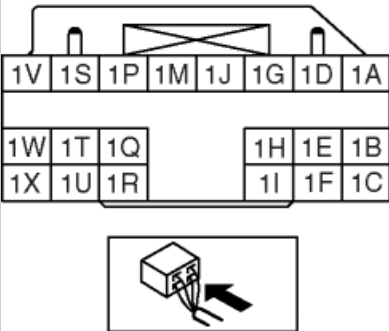
1	<b>INSPECT PAD SWITCH</b> <ul style="list-style-type: none"> <li>Using the M-MDS, verify the following PID/DATA monitor. (See <b>PID/DATA MONITOR TABLE.</b>) <ul style="list-style-type: none"> <li>I_PAD_SW</li> </ul> </li> <li>Is the PAD switch normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the PAD switch  (See <b>PASSENGER AIR BAG DEACTIVATION (PAD) SWITCH REMOVAL/INSTALLATION.</b> )
2	<b>INSPECT WIRING HARNESS BETWEEN PAD SWITCH AND SAS CONTROL MODULE</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Remove the battery cover.</li> <li>Disconnect the negative battery cable and wait for <b>1 min or more.</b> (See <b>BATTERY REMOVAL/INSTALLATION [LF].</b>)</li> <li>Disconnect the PAD switch connectors.</li> <li>Inspect the wiring harness between SAS control module terminal 1Q and PAD switch terminal D, SAS control module terminal 1H and PAD switch terminal C for the following: <ul style="list-style-type: none"> <li>Short to ground</li> <li>Open circuit</li> </ul> </li> <li>Is the wiring harness normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the air bag wiring harness.
3	<b>INSPECT PAD SWITCH</b> <ul style="list-style-type: none"> <li>Disconnect the PAD switch connectors.</li> <li>Is there continuity between terminal E of PAD switch connector and ground?</li> </ul>	Yes	Replace the SAS control module.  (See <b>SAS CONTROL MODULE REMOVAL/INSTALLATION.</b> )
		No	Replace the air bag wiring harness.

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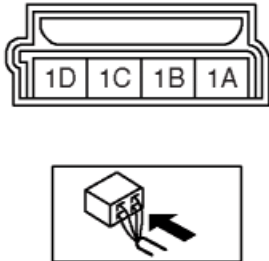
DTC B1916, B1932, B1934, B1936

DTC	B1916	Driver-side air bag module (inflator No.1) circuit short to power supply
	B1932	Driver-side air bag module (inflator No.1) circuit resistance high
	B1934	Driver-side air bag module (inflator No.1) circuit resistance low
	B1936	Driver-side air bag module (inflator No.1) circuit short to body ground
DETECTION CONDITION	<p><b>WARNING:</b></p> <ul style="list-style-type: none"><li>• Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.</li><li>• Resistance other than <b>1.5—4.7 ohms</b> detected in driver-side air bag module (inflator No.1) circuit</li><li>• Malfunction in wiring harness between driver-side air bag module (inflator No.1) and SAS control module</li></ul>	
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Open or short circuit in wiring harness between clock spring and SAS control module</li><li>• Clock spring malfunction</li><li>• Driver-side air bag module (inflator No.1) malfunction</li><li>• SAS control module malfunction</li></ul>	

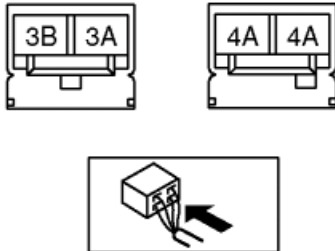
SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR



CLOCK SPRING WIRING HARNESS-SIDE CONNECTOR



DRIVER-SIDE AIR BAGMODULE WIRING HARNESS-SIDE CONNECTOR (CLOCK SPRING ) (INFLATOR NO. 1) (INFLATOR NO. 2)



Diagnostic procedure

STEP	INSPECTION	ACTION
1	<p><b>INSPECT DRIVER SIDE AIR BAG MODULE (INFLATOR NO.1)</b></p> <ul style="list-style-type: none"><li>Using the M-MDS, verify the following PID/DATA monitor. (See <a href="#">PID/DATA MONITOR TABLE</a>.)<ul style="list-style-type: none"><li>RES_AB_D</li></ul></li><li>Is the resistance of the driver-side air bag module normal?</li></ul>	<p>Yes Replace the SAS control module.</p> <p>(See <a href="#">SAS CONTROL MODULE REMOVAL/INSTALLATION</a>.)</p>

	<ul style="list-style-type: none"> <li>Resistance: <b>1.5—4.7 ohms</b></li> </ul>	No	Go to the next step.
2	<b>INSPECT DRIVER SIDE AIR BAG MODULE CONNECTOR (CLOCK SPRING)</b>  <b>WARNING:</b> <ul style="list-style-type: none"> <li>Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the service warnings and cautions before handling the air bag system components.</li> <li>(See <a href="#">AIR BAG SYSTEM SERVICE WARNINGS</a>.)</li> <li>(See <a href="#">AIR BAG SYSTEM SERVICE CAUTIONS</a>.)</li> <li>Turn the ignition switch to the LOCK position.</li> <li>Remove the battery cover.</li> <li>Disconnect the negative battery cable and wait for <b>1 min or more</b>.</li> <li>(See <a href="#">BATTERY REMOVAL/INSTALLATION [LF]</a>.)</li> <li>Remove the driver-side air bag module.</li> <li>Is there any malfunction of the driver-side air bag module connector?</li> </ul>	Yes	Replace the air bag wiring harness.
		No	Go to the next step.
3	<b>VERIFY WHETHER MALFUNCTION IS IN DRIVER SIDE AIR BAG MODULE (INFLATOR NO.1) OR RELATED WIRING HARNESS</b> <ul style="list-style-type: none"> <li>Connect the leads of the <b>SST</b> (Fuel and thermometer checker) or apply <b>2-ohm</b> resistance to driver-side air bag module (inflator No.1) connector terminals 2A and 2B, and driver-side air bag module (inflator No.2) connector terminals 3A and 3B.</li> <li>Set the resistance of the <b>SST</b> (Fuel and thermometer checker) to the <b>2-ohm</b> position.</li> <li>Connect the negative battery cable.</li> <li>Turn the ignition switch to the ON position.</li> <li>Are DTCs B1916, B1932, B1934 and/or B1936?</li> </ul>	Yes	Go to the next step.
		No	Replace the driver-side air bag module.  (See <a href="#">DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION</a> .)
4	<b>INSPECT CLOCK SPRING</b> <ul style="list-style-type: none"> <li>Inspect the clock spring.</li> <li>(See <a href="#">CLOCK SPRING INSPECTION</a>.)</li> <li>Is the clock spring normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the clock spring.  (See <a href="#">CLOCK SPRING REMOVAL/INSTALLATION</a> .)
5	<b>INSPECT WIRING HARNESS BETWEEN CLOCK SPRING AND SAS CONTROL MODULE</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Remove the battery cover.</li> <li>Disconnect the negative battery cable and wait for <b>1 min or more</b>.</li> <li>(See <a href="#">BATTERY REMOVAL/INSTALLATION [LF]</a>.)</li> <li>Remove the column cover.</li> <li>Disconnect the clock spring connector.</li> <li>Remove the glove compartment.</li> <li>Disconnect the passenger-side air bag module connector.</li> <li>(See <a href="#">PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION</a>.)</li> <li>Disconnect the driver and passenger-side seat connectors.</li> <li>Remove the back trim.</li> <li>Disconnect the driver and passenger-side pre-tensioner seat belt connectors.</li> <li>Inspect the wiring harness between SAS control module terminal 1D and clock spring terminal 1L, SAS control module terminal 1A and clock spring terminal 1J</li> </ul>	Yes	Replace the SAS control module.  (See <a href="#">SAS CONTROL MODULE REMOVAL/INSTALLATION</a> .)
		No	Replace the air bag wiring harness.

for the following:

- Short to ground
- Short to power supply
- Open circuit
- Is the wiring harness normal?

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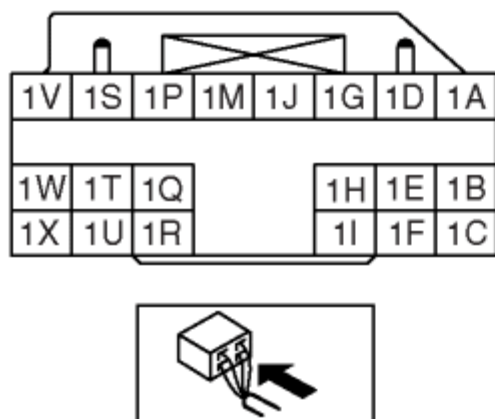
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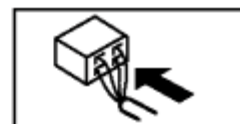
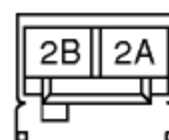
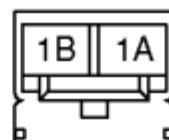
DTC B1925, B1933, B1935, B1938

DTC	B1925	Passenger-side air bag module (inflator No.1) circuit short to power supply
	B1933	Passenger-side air bag module (inflator No.1) circuit resistance high
	B1935	Passenger-side air bag module (inflator No.1) circuit resistance low
	B1938	Passenger-side air bag module (inflator No.1) circuit short to body ground
DETECTION CONDITION	<p><b>WARNING:</b></p> <ul style="list-style-type: none"><li>• Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.</li><li>• Resistance other than <b>1.3—4.7 ohms</b> detected in passenger-side air bag module (inflator No.1) circuit</li><li>• Malfunction in wiring harness between passenger-side air bag module (inflator No.1) and SAS control module</li></ul>	
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Open or short circuit in wiring harness between passenger-side air bag module (inflator No.1) and SAS control module</li><li>• Passenger-side air bag module (inflator No.1) malfunction</li><li>• SAS control module malfunction</li></ul>	

## SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR



## PASSENGER-SIDE AIR BAG MODULE WIRING HARNESS-SIDE CONNECTOR (INFLATOR NO. 1) (INFLATOR NO. 2)



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT PASSENGER SIDE AIR BAG MODULE (INFLATOR NO.1)</b> <ul style="list-style-type: none"> <li>Using the M-MDS, verify the following PID/DATA monitor. (See <a href="#">PID/DATA MONITOR TABLE</a>.) <ul style="list-style-type: none"> <li>RES_AB_P</li> </ul> </li> <li>Is the resistance of the passenger-side air bag module normal? <ul style="list-style-type: none"> <li>Resistance: <b>1.3—4.7 ohms</b></li> </ul> </li> </ul>	Yes Replace the SAS control module.  (See <a href="#">SAS CONTROL MODULE REMOVAL/INSTALLATION</a> .)
		No Go to the next step.
2	<b>INSPECT PASSENGER SIDE AIR BAG MODULE (INFLATOR NO.1) CONNECTOR</b>  <b>WARNING:</b> <ul style="list-style-type: none"> <li>Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components. (See <a href="#">AIR BAG SYSTEM SERVICE WARNINGS</a>.) (See <a href="#">AIR BAG SYSTEM SERVICE CAUTIONS</a>.)</li> <li>Turn the ignition switch to the LOCK position.</li> <li>Remove the battery cover.</li> <li>Disconnect the negative battery cable and wait for <b>1 min or more</b>. (See <a href="#">BATTERY REMOVAL/INSTALLATION [LF]</a>.)</li> </ul>	Yes Replace the air bag wiring harness.
		No Go to the next step.



	<ul style="list-style-type: none"> <li>Remove the glove compartment.</li> <li>Disconnect the passenger-side air bag module connector.</li> </ul> <p>(See <b>PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.</b>)</p> <ul style="list-style-type: none"> <li>Is there any malfunction of the passenger-side air bag module connector?</li> </ul>		
3	<b>VERIFY WHETHER MALFUNCTION IS IN PASSENGER-SIDE AIR BAG MODULE (INFLATOR NO.1) OR RELATED WIRING HARNESS</b>	Yes	Go to the next step.
	<ul style="list-style-type: none"> <li>Connect the leads of the <b>SST</b> (Fuel and thermometer checker) or apply <b>2-ohm</b> resistance to passenger-side air bag module (inflator No.1) connector terminals 1A and 1B, and passenger-side air bag module (inflator No.2) connector terminals 2A and 2B.</li> <li>Set the resistance of the <b>SST</b> (Fuel and thermometer checker) to the <b>2-ohm</b> position.</li> <li>Connect the negative battery cable.</li> <li>Turn the ignition switch to the ON position.</li> <li>Are DTCs B1925, B1933, B1935 and/or B1938 indicated?</li> </ul>	No	Replace the passenger-side air bag module.  (See <b>PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.</b> )
4	<b>INSPECT WIRING HARNESS BETWEEN PASSENGER-SIDE AIR BAG MODULE (INFLATOR NO.1) AND SAS CONTROL MODULE</b>	Yes	Replace the SAS control module.  (See <b>SAS CONTROL MODULE REMOVAL/INSTALLATION.</b> )
	<ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Remove the battery cover.</li> <li>Disconnect the negative battery cable and wait for <b>1 min or more</b>.</li> </ul> <p>(See <b>BATTERY REMOVAL/INSTALLATION [LF].</b>)</p> <ul style="list-style-type: none"> <li>Remove the column cover.</li> <li>Disconnect the clock spring connector.</li> <li>Remove the glove compartment.</li> <li>Disconnect the passenger-side air bag module connector.</li> </ul> <p>(See <b>PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.</b>)</p> <ul style="list-style-type: none"> <li>Disconnect the driver and passenger-side seat connectors.</li> <li>Remove the back trim.</li> <li>Disconnect the driver and passenger-side pre-tensioner seat belt connectors.</li> </ul>	No	Replace the air bag wiring harness.

- |  |  |
|--|--|
| <ul style="list-style-type: none"><li>• Inspect the wiring harness between SAS control module terminal 1V and passenger-side air bag module terminal 1A, SAS control module terminal 1S and passenger-side air bag module terminal 1B for the following:<ul style="list-style-type: none"><li>▪ Short to ground</li><li>▪ Short to power supply</li><li>▪ Open circuit</li></ul></li><li>• Is the wiring harness normal?</li></ul> |  |
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### DTC B2477

DTC B2477	Configuration error
<b>DETECTION CONDITION</b>	<p><b>WARNING:</b></p> <ul style="list-style-type: none"> <li>Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.</li> <li>SAS control module configuration has not been performed correctly.</li> </ul>
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>SAS control module configuration error</li> <li>SAS control module malfunction</li> </ul>

### Diagnostic procedure

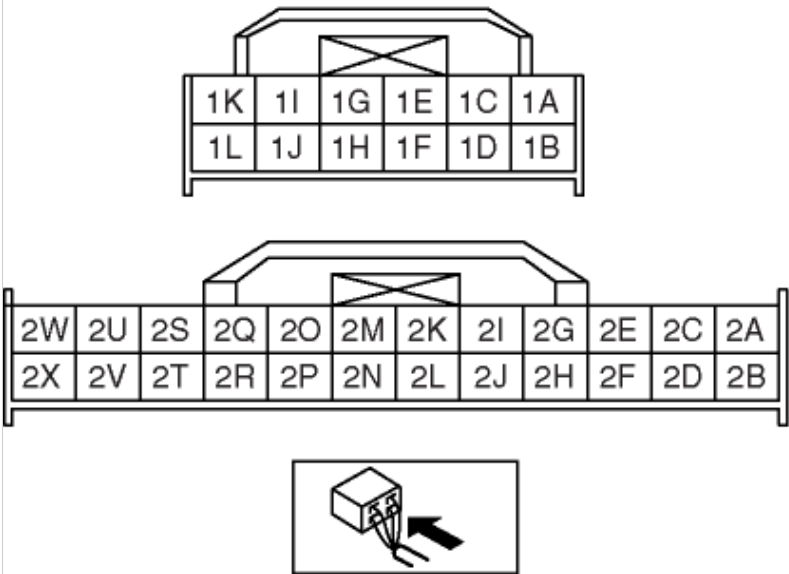
STEP	INSPECTION	ACTION
1	<b>INSPECT SAS CONTROL MODULE</b> <ul style="list-style-type: none"> <li>Using the M-MDS, perform SAS control module configuration.</li> <li>Is DTC B2477 indicated?</li> </ul>	Yes Replace the SAS control module. (See <a href="#">SAS CONTROL MODULE REMOVAL/INSTALLATION.</a> )
		No DTC troubleshooting completed.

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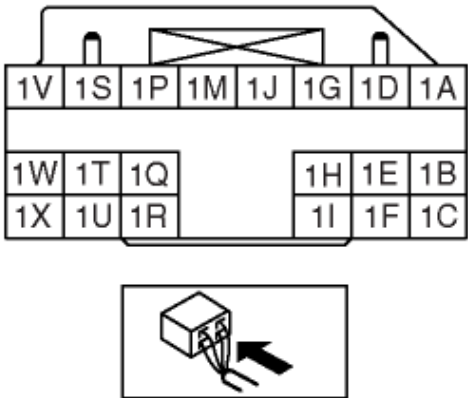
DTC B1428

DTC	B1428	Seat belt warning light circuit open
DETECTION CONDITION	<p><b>WARNING:</b></p> <ul style="list-style-type: none"><li>Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.</li><li>Malfunction in the seat belt warning light circuit</li></ul>	
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Instrument cluster malfunction</li><li>Malfunction of the connectors between the instrument cluster and SAS control module</li><li>Open or short circuit in the wiring harness between the battery and the instrument cluster</li><li>Open or short circuit in the wiring harness between the instrument cluster and SAS control module</li><li>SAS control module malfunction</li></ul>	

INSTRUMENT CLUSTER WIRING HARNESS-SIDE CONNECTOR



SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR



## Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT FOR CONTINUITY BETWEEN BATTERY FUSE AND INSTRUMENT CLUSTER</b> <ul style="list-style-type: none"> <li>• Connect negative battery cable.</li> <li>• Turn the ignition switch to the ON position.</li> <li>• Measure the voltage at instrument cluster connector terminal 2A.</li> <li>• Is the voltage <b>9 V or more</b>?</li> </ul>	Yes Go to the next step.
		No Repair the related wiring harness.
2	<b>INSPECT WIRING HARNESS BETWEEN INSTRUMENT CLUSTER AND SAS CONTROL MODULE</b> <p><b>WARNING:</b></p> <ul style="list-style-type: none"> <li>• Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components.</li> </ul> <p>(See <a href="#">AIR BAG SYSTEM SERVICE WARNINGS</a>.)</p> <p>(See <a href="#">AIR BAG SYSTEM SERVICE CAUTIONS</a>.)</p> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the LOCK position.</li> <li>• Remove the battery cover.</li> <li>• Disconnect the negative battery cable and wait for <b>1 min or more</b>.</li> </ul> <p>(See <a href="#">BATTERY REMOVAL/INSTALLATION [LF]</a>.)</p> <ul style="list-style-type: none"> <li>• Remove the column cover.</li> <li>• Disconnect the clock spring connector.</li> <li>• Remove the glove compartment.</li> <li>• Disconnect the passenger-side air bag module connector.</li> </ul> <p>(See <a href="#">PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION</a>.)</p> <ul style="list-style-type: none"> <li>• Disconnect the driver and passenger-side seat connectors.</li> <li>• Remove the back trim.</li> <li>• Disconnect the driver and passenger-side pre-tensioner seat belt connectors.</li> <li>• Disconnect the SAS control module connector.</li> <li>• Disconnect the instrument cluster connector.</li> <li>• Inspect the wiring harness between SAS control module terminal 1X and instrument cluster terminal 2A for the</li> </ul>	Yes Go to the next step.
		No Replace the air bag wiring harness.

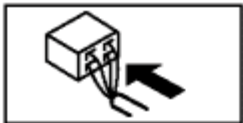
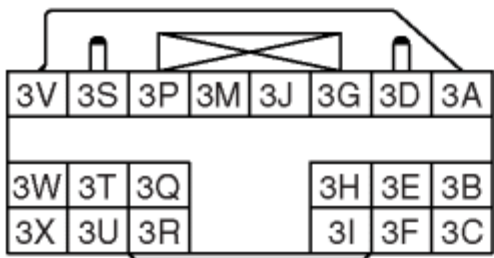
	<p>following:</p> <ul style="list-style-type: none"><li>▪ Short to ground</li><li>▪ Short to power supply</li><li>▪ Open circuit</li></ul> <ul style="list-style-type: none"><li>• Is the wiring harness normal?</li></ul>		
3	<b>INSPECT SEAT BELT WARNING LIGHT</b> <ul style="list-style-type: none"><li>• Connect the instrument cluster connector.</li><li>• Ground instrument cluster connector terminal 1E using a jumper wire.</li><li>• Turn the ignition switch to the ON position.</li><li>• Does the seat belt warning light illuminate?</li></ul>	Yes	Replace the SAS control module.  (See <b>SAS CONTROL MODULE REMOVAL/INSTALLATION.</b> )
		No	Replace the instrument cluster.  (See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION.</b> )

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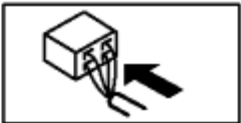
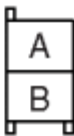
DTC B2433, B2434

DTC	B2433	Driver side buckle switch circuit open or short to power supply
	B2434	Driver side buckle switch circuit short to body ground
DETECTION CONDITION	<p><b>WARNING:</b></p> <ul style="list-style-type: none"><li>Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.</li><li>Malfunction in driver-side buckle switch circuit</li></ul>	
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>Malfunction of connectors between driver-side buckle switch and SAS control module</li><li>Open or short circuit in wiring harness between driver-side buckle switch and SAS control module</li><li>Driver-side buckle switch malfunction</li><li>SAS control module malfunction</li></ul>	

SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR



DRIVER-SIDE BUCKLE SWITCH WIRING HARNESS-SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>INSPECT DRIVER SIDE BUCKLE SWITCH CIRCUIT</b> <ul style="list-style-type: none"><li>Using the M-MDS, verify the following PID/DATA monitor. (See <a href="#">PID/DATA MONITOR TABLE.</a>)<ul style="list-style-type: none"><li>BUCKLE_D</li></ul></li><li>Is the driver-side buckle switch normal?</li></ul>	Yes	Replace the SAS control module.  (See <a href="#">SAS CONTROL MODULE REMOVAL/INSTALLATION.</a> )
		No	Go to the next step.
2	<b>INSPECT WIRING HARNESS BETWEEN DRIVER-SIDE BUCKLE SWITCH AND GROUND</b>  <b>WARNING:</b> <ul style="list-style-type: none"><li>Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the service warnings and cautions before handling the air bag system components.  (See <a href="#">AIR BAG SYSTEM SERVICE WARNINGS.</a>) (See <a href="#">AIR BAG SYSTEM SERVICE CAUTIONS.</a>)</li><li>Turn the ignition switch to the LOCK position.</li><li>Remove the battery cover.</li><li>Disconnect the negative battery cable and wait for <b>1 min or more</b>.  (See <a href="#">BATTERY REMOVAL/INSTALLATION [LF].</a>)</li><li>Disconnect the driver-side buckle switch connector.</li><li>Inspect the wiring harness between driver-side buckle switch terminal B and ground for the following:<ul style="list-style-type: none"><li>Short to power supply</li><li>Open circuit</li></ul></li><li>Is the wiring harness normal?</li></ul>	Yes	Go to the next step.
		No	Replace the wiring harness.
3	<b>INSPECT WIRING HARNESS BETWEEN DRIVER-SIDE BUCKLE SWITCH AND SAS CONTROL MODULE</b> <ul style="list-style-type: none"><li>Disconnect the driver and passenger-side seat connectors.</li><li>Remove the back trim.</li><li>Disconnect the driver and passenger-side pre-tensioner seat belt connectors.</li></ul>	Yes	Replace the driver-side buckle.  (See <a href="#">BUCKLE REMOVAL/INSTALLATION.</a> )  If the DTC is displayed even after the buckle switch is replaced, replace the SAS control module.



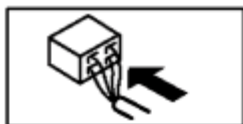
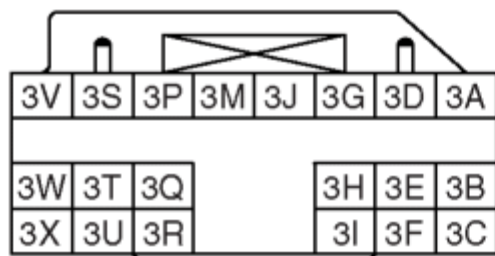
	<p>Disconnect the SAS control module connector.</p> <ul style="list-style-type: none"><li>• Inspect the wiring harness between SAS control module terminal 3A and driver-side buckle switch terminal A, SAS control module terminal 3D and driver-side buckle switch terminal B for the following:<ul style="list-style-type: none"><li>▪ Short to ground</li><li>▪ Short to power supply</li><li>▪ Open circuit</li></ul></li><li>• Is the wiring harness normal?</li></ul>		(See <b>SAS CONTROL MODULE REMOVAL/INSTALLATION.</b> )
		No	Replace the wiring harness.

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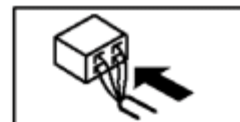
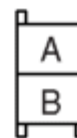
DTC B2437, B2438

DTC	B2437	Passenger side buckle switch circuit open or short to power supply
	B2438	Passenger side buckle switch circuit short to body ground
DETECTION CONDITION	<p><b>WARNING:</b></p> <ul style="list-style-type: none"><li>• Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.</li><li>• Malfunction in the wiring harness between the passenger-side buckle switch and SAS control module</li><li>• Malfunction in passenger-side buckle switch circuit</li></ul>	
POSSIBLE CAUSE	<ul style="list-style-type: none"><li>• Malfunction of connectors between passenger-side buckle switch and SAS control module</li><li>• Open or short circuit in wiring harness between passenger-side buckle switch and SAS control module</li><li>• Passenger-side buckle switch malfunction</li><li>• SAS control module malfunction</li></ul>	

## SAS CONTROL MODULE WIRING HARNESS-SIDE CONNECTOR



## PASSENGER-SIDE BUCKLE SWITCH WIRING HARNESS-SIDE CONNECTOR



### Diagnostic procedure

STEP	INSPECTION	ACTION
1	<b>INSPECT DRIVER SIDE BUCKLE SWITCH CIRCUIT</b> <ul style="list-style-type: none"> <li>Using the M-MDS, verify the following PID/DATA monitor. (See <a href="#">PID/DATA MONITOR TABLE</a>.) <ul style="list-style-type: none"> <li>BUCKLE_P</li> </ul> </li> <li>Is the passenger-side buckle switch normal?</li> </ul>	<p>Yes Replace the SAS control module.</p> <p>(See <a href="#">SAS CONTROL MODULE REMOVAL/INSTALLATION</a>.)</p> <p>No Go to the next step.</p>
2	<b>INSPECT WIRING HARNESS BETWEEN PASSENGER-SIDE BUCKLE SWITCH AND GROUND</b> <p><b>WARNING:</b></p> <ul style="list-style-type: none"> <li>Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belt, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components.</li> </ul> <p>(See <a href="#">AIR BAG SYSTEM SERVICE WARNINGS</a>.)</p> <p>(See <a href="#">AIR BAG SYSTEM SERVICE CAUTIONS</a>.)</p> <ul style="list-style-type: none"> <li>Turn the ignition switch to the LOCK position.</li> <li>Remove the battery cover.</li> <li>Disconnect the negative battery cable and wait for <b>1 min or more</b>.</li> </ul> <p>(See <a href="#">BATTERY REMOVAL/INSTALLATION [LF]</a>.)</p> <ul style="list-style-type: none"> <li>Disconnect the passenger-side buckle switch connector.</li> </ul>	<p>Yes Go to the next step.</p> <p>No Replace the wiring harness.</p>

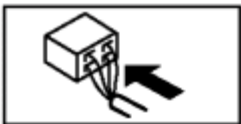
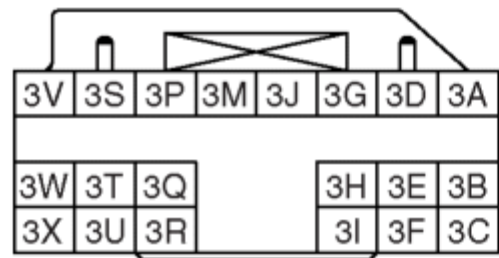
	<ul style="list-style-type: none"><li>• Inspect the wiring harness between passenger-side buckle switch terminal B and ground for the following:<ul style="list-style-type: none"><li>▪ Short to power supply</li><li>▪ Open circuit</li></ul></li><li>• Is the wiring harness normal?</li></ul>		
3	<b>INSPECT WIRING HARNESS BETWEEN PASSENGER-SIDE BUCKLE SWITCH AND SAS CONTROL MODULE</b> <ul style="list-style-type: none"><li>• Disconnect the driver and passenger-side seat connectors.</li><li>• Remove the back trim.</li><li>• Disconnect the driver and passenger-side pre-tensioner seat belt connectors.</li><li>• Disconnect the SAS control module connector.</li><li>• Inspect the wiring harness between SAS control module terminal 3J and passenger-side buckle switch terminal A, SAS control module terminal 3G and passenger-side buckle switch terminal B for the following:<ul style="list-style-type: none"><li>▪ Short to ground</li><li>▪ Short to power supply</li><li>▪ Open circuit</li></ul></li><li>• Is the wiring harness normal?</li></ul>	Yes	Replace the passenger-side buckle.  (See <b>BUCKLE REMOVAL/INSTALLATION.</b> )  If the DTC is displayed even after the buckle switch is replaced, replace the SAS control module.  (See <b>SAS CONTROL MODULE REMOVAL/INSTALLATION.</b> )
		No	Replace the wiring harness.

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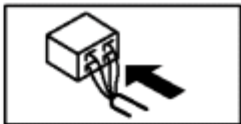
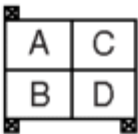
DTC C1946, C1947, C1948, C1982

DTC	C1946	Seat track position sensor circuit open
	C1947	Seat track position sensor circuit short to body ground
	C1948	Seat track position sensor circuit resistance not within specification
	C1982	Seat track position sensor circuit short to power supply
DETECTION CONDITION		<p><b>WARNING:</b></p> <ul style="list-style-type: none"><li>• Detection conditions are for understanding the DTC outline before performing an inspection. Performing an inspection according to only the detection conditions may cause injury due to an operating error, or damage the system. When performing an inspection, always follow the inspection procedure.</li><li>• Malfunction in seat track position sensor circuit.</li></ul>
POSSIBLE CAUSE		<ul style="list-style-type: none"><li>• Malfunction of connector between seat track position sensor and SAS control module.</li><li>• Open or short circuit in wiring harness between seat track position sensor and SAS control module.</li><li>• Seat track position sensor malfunction</li><li>• SAS control module malfunction</li></ul>

SAS CONTROL MODULE WIRING  
HARNESS-SIDE CONNECTOR



SEAT TRACK POSITION SENSOR WIRING  
HARNESS-SIDE CONNECTOR



Diagnostic procedure

STEP	INSPECTION	ACTION	
1	<b>INSPECT SEAT TRACK POSITION SENSOR CIRCUIT</b> <ul style="list-style-type: none"><li>Using the M-MDS, verify the following PID/DATA monitor. (See <b>PID/DATA MONITOR TABLE</b>.)<ul style="list-style-type: none"><li>TRAK_SW</li></ul></li><li>Is the seat track position sensor circuit normal?</li></ul>	Yes	Replace the SAS control module.  (See <b>SAS CONTROL MODULE REMOVAL/INSTALLATION</b> .)
		No	Go to the next step.
2	<b>INSPECT WIRING HARNESS BETWEEN SEAT TRACK POSITION SENSOR AND SAS CONTROL MODULE</b> <b>WARNING:</b> <ul style="list-style-type: none"><li>Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components. (See <b>AIR BAG SYSTEM SERVICE WARNINGS</b>.) (See <b>AIR BAG SYSTEM SERVICE CAUTIONS</b>.)</li><li>Turn the ignition switch to the LOCK position.</li><li>Remove the battery cover.</li><li>Disconnect the negative battery cable and wait for <b>1 min or more</b>. (See <b>BATTERY REMOVAL/INSTALLATION [LF]</b>.)</li><li>Remove the column cover.</li></ul>	Yes	Replace the seat track position sensor, then go to the next step.
		No	Replace wiring harness, then go to the next step.

	<ul style="list-style-type: none"> <li>• Disconnect the clock spring connector.</li> <li>• Remove the glove compartment.</li> <li>• Disconnect the passenger-side air bag module connector.</li> </ul> <p>(See <b>PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.</b>)</p> <ul style="list-style-type: none"> <li>• Disconnect the driver and passenger side seat connectors.</li> <li>• Remove the back trim.</li> <li>• Disconnect the driver and passenger-side pre-tensioner seat belt connectors.</li> <li>• Disconnect the seat track position sensor connector.</li> <li>• Inspect the wiring harness between SAS control module terminal and seat track position sensor terminals for short to ground, short to power supply, and open circuit: <ul style="list-style-type: none"> <li>▪ 3M—C</li> <li>▪ 3P—A</li> </ul> </li> <li>• Is the wiring harness normal?</li> </ul>		
3	<b>INSPECT SAS CONTROL MODULE</b> <ul style="list-style-type: none"> <li>• Connect the SAS control module connector.</li> <li>• Connect the driver-side air bag module connector.</li> <li>• Connect the passenger-side air bag module connector.</li> <li>• Connect the driver-and passenger-side side air bag module connectors.</li> <li>• Connect the driver-and passenger-side pre-tensioner seat belt connectors.</li> <li>• Connect the seat track position sensor connector.</li> <li>• Are DTCs C1946, C1947, C1948 and/or C1982 indicated?</li> </ul>	Yes	Replace the SAS control module.  (See <b>SAS CONTROL MODULE REMOVAL/INSTALLATION.</b> )
		No	DTC troubleshooting completed.

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### NO.1 AIR BAG SYSTEM WARNING LIGHT DOES NOT ILLUMINATE

<b>1</b>	<b>Air bag system warning light does not illuminate.</b>
<b>DETECTION CONDITION</b>	Malfunction in air bag system warning light circuit (short to ground)
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• SAS control module malfunction</li> <li>• Instrument cluster (circuit board) malfunction</li> <li>• Short to ground circuit in wiring harness between instrument cluster and SAS control module</li> </ul>

### Diagnostic Procedure

- When performing an asterisked (\*) troubleshooting inspection, slightly shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunction. If there is a problem, verify that connectors, terminals and wiring harness are connected correctly and undamaged.

STEP	INSPECTION	ACTION
1	<b>INSPECT OTHER WARNING AND INDICATOR LIGHTS CIRCUIT IN INSTRUMENT CLUSTER</b> <ul style="list-style-type: none"> <li>• Turn the ignition switch to the ON position.</li> <li>• Do other warning and indicator lights illuminate?</li> </ul>	Yes Turn the ignition switch to the LOCK position, then go to the next step.
		No Inspect instrument cluster power supply system and ground system the, then go to Step 4.
2	<b>INSPECT SAS CONTROL MODULE</b> <b>WARNING:</b> <ul style="list-style-type: none"> <li>• Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you.</li> </ul>	Yes Replace the SAS control module, then go to Step 4.  (See <b>SAS CONTROL MODULE</b> )



	<p>Read the air bag system service warnings and cautions before handling the air bag system components.</p> <p>(See <b>AIR BAG SYSTEM SERVICE WARNINGS.</b>)</p> <p>(See <b>AIR BAG SYSTEM SERVICE CAUTIONS.</b>)</p> <ul style="list-style-type: none"><li>• Turn the ignition switch to LOCK position.</li><li>• Remove the battery cover.</li><li>• Disconnect the negative battery cable and wait for <b>1 min or more.</b></li></ul> <p>(See <b>BATTERY REMOVAL/INSTALLATION [LF].</b>)</p> <ul style="list-style-type: none"><li>• Remove the column cover.</li><li>• Disconnect the clock spring connector.</li><li>• Remove the glove compartment.</li><li>• Disconnect the passenger-side air bag module connector.</li></ul> <p>(See <b>PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.</b>)</p> <ul style="list-style-type: none"><li>• Disconnect the driver and passenger side seat connectors.</li><li>• Remove the back trim.</li><li>• Disconnect the driver and passenger side pre tensioner seat belt connectors.</li><li>• Disconnect all SAS control module connectors.</li><li>• Connect the negative battery cable.</li><li>• Turn the ignition switch to ON position.</li><li>• Does the air bag system warning light illuminate?</li></ul>	<b>REMOVAL/INSTALLATION.)</b>	No	Go to the next step.
*3	<p><b>INSPECT WIRING HARNESS BETWEEN SAS CONTROL MODULE AND INSTRUMENT CLUSTER FOR SHORT TO GROUND</b></p> <ul style="list-style-type: none"><li>• Turn the ignition switch to LOCK position.</li><li>• Remove the battery cover.</li><li>• Disconnect the negative battery cable.</li></ul> <p>(See <b>BATTERY REMOVAL/INSTALLATION [LF].</b>)</p> <ul style="list-style-type: none"><li>• Disconnect the instrument cluster connector.</li><li>• Is there continuity between terminal 2K of the instrument cluster connector and ground?</li></ul>		Yes	Replace the wiring harness, then go to Step 4.
			No	Replace the instrument cluster, then go to the next step.
				(See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION.</b> )
4	<p><b>CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR</b></p>		Yes	Complete troubleshooting, then explain repairs to

	<ul style="list-style-type: none"><li>• Turn the ignition switch to LOCK position.</li><li>• Remove the battery cover.</li><li>• Disconnect the negative battery cable and wait for <b>1 min or more</b>.  (See <b>BATTERY REMOVAL/INSTALLATION [LF]</b>.)</li><li>• Connect all SAS control module connectors.</li><li>• Connect the driver and passenger-side pre-tensioner seat belt connectors.</li><li>• Connect the driver and passenger side seat connectors.</li><li>• Connect the passenger side air bag module connector.</li><li>• Connect the clock spring connector.</li><li>• Connect the negative battery cable.</li><li>• Turn the ignition switch to ON position.</li><li>• Does the air bag system warning light operate properly?</li></ul>		customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction recurs.

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### NO.2 AIR BAG SYSTEM WARNING LIGHT ILLUMINATES CONSTANTLY

<b>2</b>	<b>Air bag system warning light is illuminated constantly.</b>
<b>DETECTION CONDITION</b>	Malfunction in air bag system warning light circuit (open circuit or short to power supply).
<b>POSSIBLE CAUSE</b>	<ul style="list-style-type: none"> <li>• Weak battery</li> <li>• SAS control module malfunction</li> <li>• Instrument cluster (circuit board) malfunction</li> <li>• No connection in SAS control module connector</li> <li>• Poor contact in instrument cluster connector (24-pin)</li> <li>• Open or short to power supply circuit in wiring harness between instrument cluster and SAS control module</li> <li>• Poor contact at terminals 1R, 1I and/or 1W of SAS control module connector</li> <li>• Poor contact in wiring harness between terminal 1I of SAS control module connector and ground</li> <li>• Poor contact in wiring harness between battery and terminal 1W of SAS control module</li> </ul>

### Diagnostic Procedure

- When performing an asterisked (\*) troubleshooting inspection, slightly shake the wiring harness and connectors while performing the inspection to discover whether poor contact points are the cause of any intermittent malfunction. If there is a problem, verify that connectors, terminals and wiring harness are connected correctly and undamaged.

STEP	INSPECTION	ACTION
1	<b>INSPECT BATTERY</b> <ul style="list-style-type: none"> <li>• Measure the voltage of battery.</li> </ul>	Yes Go to the next step.

	<ul style="list-style-type: none"><li>Is the voltage <b>9 V or more</b>?</li></ul>	No	Battery is weak.  Inspect charge/discharge system, then go to Step 9.  (See <b>BATTERY INSPECTION [LF]</b> .)
2	<b>VERIFY THAT SAS CONTROL MODULE CONNECTOR IS CONNECTED</b>  <b>WARNING:</b> <ul style="list-style-type: none"><li>Handling the air bag system components improperly can accidentally deploy the air bag modules and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag system components.  (See <b>AIR BAG SYSTEM SERVICE WARNINGS</b>.)  (See <b>AIR BAG SYSTEM SERVICE CAUTIONS</b>.)</li><li>Turn the ignition switch to LOCK position.</li><li>Remove the battery cover.</li><li>Disconnect the negative battery cable and wait for <b>1 min or more</b>.  (See <b>BATTERY REMOVAL/INSTALLATION [LF]</b>.)</li><li>Are all SAS control module connectors securely connected?</li></ul>	Yes	Go to the next step.
* 3	<b>INSPECT WIRING HARNESS BETWEEN SAS CONTROL MODULE AND INSTRUMENT CLUSTER FOR CONTINUITY</b> <ul style="list-style-type: none"><li>Remove the column cover.</li><li>Disconnect the clock spring connector.</li><li>Remove the glove compartment.</li><li>Disconnect the passenger side air bag module connector.  (See <b>PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION</b>.)</li><li>Disconnect the driver and passenger side seat connectors.</li><li>Remove the back trim.</li><li>Disconnect the driver and passenger side pre tensioner seat belt connectors.</li><li>Disconnect all SAS control module connectors.</li><li>Disconnect the instrument cluster connector.</li></ul>	Yes	Go to the next step.
		No	Replace the wiring harness, then go to Step 9.

	<ul style="list-style-type: none"> <li>Is there continuity between SAS control module connector terminal 1R and instrument cluster connector terminal 2K?</li> </ul>		
* 4	<b>INSPECT WIRING HARNESS BETWEEN SAS CONTROL MODULE AND INSTRUMENT CLUSTER FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>Connect the negative battery cable.</li> <li>Turn the ignition switch to ON position.</li> <li>Measure the voltage at instrument cluster connector terminal 2K.</li> <li>Is the voltage <b>9 V or more?</b></li> </ul>	Yes	Replace the wiring harness, then go to Step 9.
		No	Go to the next step.
5	<b>CHECK TO SEE WHETHER MALFUNCTION IS IN AIR BAG SYSTEM WARNING LIGHT IN INSTRUMENT CLUSTER</b> <ul style="list-style-type: none"> <li>Connect instrument cluster connector terminal 2K to ground, then reconnect the connector</li> <li>Does the air bag system warning light illuminate with ignition switch ON?</li> </ul>	Yes	Replace the instrument cluster, then go to Step 9.  (See <b>INSTRUMENT CLUSTER REMOVAL/INSTALLATION.</b> )
		No	Go to the next step.
6	<b>INSPECT POWER SUPPLY CIRCUIT OF SAS CONTROL MODULE (TERMINAL 1W)</b> <ul style="list-style-type: none"> <li>Turn the ignition switch to LOCK position.</li> <li>Remove the battery cover.</li> <li>Disconnect the negative battery cable and wait for <b>1 min or more.</b> (See <b>BATTERY REMOVAL/INSTALLATION [LF].</b>)</li> <li>Connect all SAS control module connectors.</li> <li>Connect the driver and passenger-side pre-tensioner seat belt connectors.</li> <li>Connect the driver and passenger side seat connectors.</li> <li>Connect the passenger side air bag module connector.</li> <li>Connect the driver-side air bag module connector.</li> <li>Inspect the voltage for PID/DATA monitor IGN_V_2 item using M-MDS.</li> <li>Is the voltage of at least one terminal <b>9 V or more?</b></li> </ul>	Yes	Go to the Step 8.
		No	Go to the next step.
7	<b>INSPECT WIRING HARNESS BETWEEN BATTERY AND FUSE BLOCK</b> <ul style="list-style-type: none"> <li>Connect the negative battery cable.</li> </ul>	Yes	Go to the next step.
		No	Repair the wiring

	<ul style="list-style-type: none"><li>• Turn the ignition switch to ON position.</li><li>• Measure the voltage at instrument cluster connector terminal 1G.</li><li>• Is the voltage <b>9 V or more</b>?</li></ul>		harnesses, then go to Step 9.
8	<b>VERIFY THAT SAS CONTROL MODULE CONNECTOR TERMINAL 1I IS GROUND</b> <ul style="list-style-type: none"><li>• Turn the ignition switch to LOCK position.</li><li>• Remove the battery cover.</li><li>• Disconnect the negative battery cable and wait for <b>1 min or more</b>.</li></ul> (See <b>BATTERY REMOVAL/INSTALLATION [LF]</b> .) <ul style="list-style-type: none"><li>• Remove the column cover.</li><li>• Disconnect the clock spring connector.</li><li>• Remove the glove compartment.</li><li>• Disconnect the passenger-side air bag module connector.</li></ul> (See <b>PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION</b> .) <ul style="list-style-type: none"><li>• Disconnect the driver and passenger side seat connectors.</li><li>• Remove the rear back trim.</li><li>• Disconnect the driver and passenger-side pre-tensioner seat belt connectors.</li><li>• Remove the center panel module.</li><li>• Disconnect all SAS control module control model connectors.</li><li>• Inspect the wiring harness between SAS control module connector terminal 1I and ground for the following:<ul style="list-style-type: none"><li>▪ Short to power supply</li><li>▪ Open circuit</li></ul></li><li>• Is the wiring harness normal?</li></ul>	Yes	Replace the SAS control module, then go to the next step.  (See <b>SAS CONTROL MODULE REMOVAL/INSTALLATION</b> .)
		No	Replace the wiring harnesses, then go to the next step.
9	<b>CONFIRM THAT MALFUNCTION SYMPTOMS DO NOT RECUR AFTER REPAIR</b> <ul style="list-style-type: none"><li>• Turn the ignition switch to LOCK position.</li><li>• Remove the battery cover.</li><li>• Disconnect the negative battery cable and wait for <b>1 min or more</b>.</li></ul>	Yes	Complete troubleshooting, then explain repairs to customer.
		No	Recheck malfunction symptoms, then repeat from Step 1 if malfunction

(See **BATTERY REMOVAL/INSTALLATION [LF]**.)

- Connect all SAS control module connectors.
- Connect the driver and passenger-side pre-tensioner seat belt connectors.
- Connect the driver and passenger side seat connectors.
- Connect the passenger side air bag module connector.
- Connect the clock spring connector.
- Connect the instrument cluster connector.
- Connect the negative battery cable.
- Turn the ignition switch to ON position.
- Does the air bag system warning light operate properly?

recurs.

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TROUBLESHOOTING INDEX

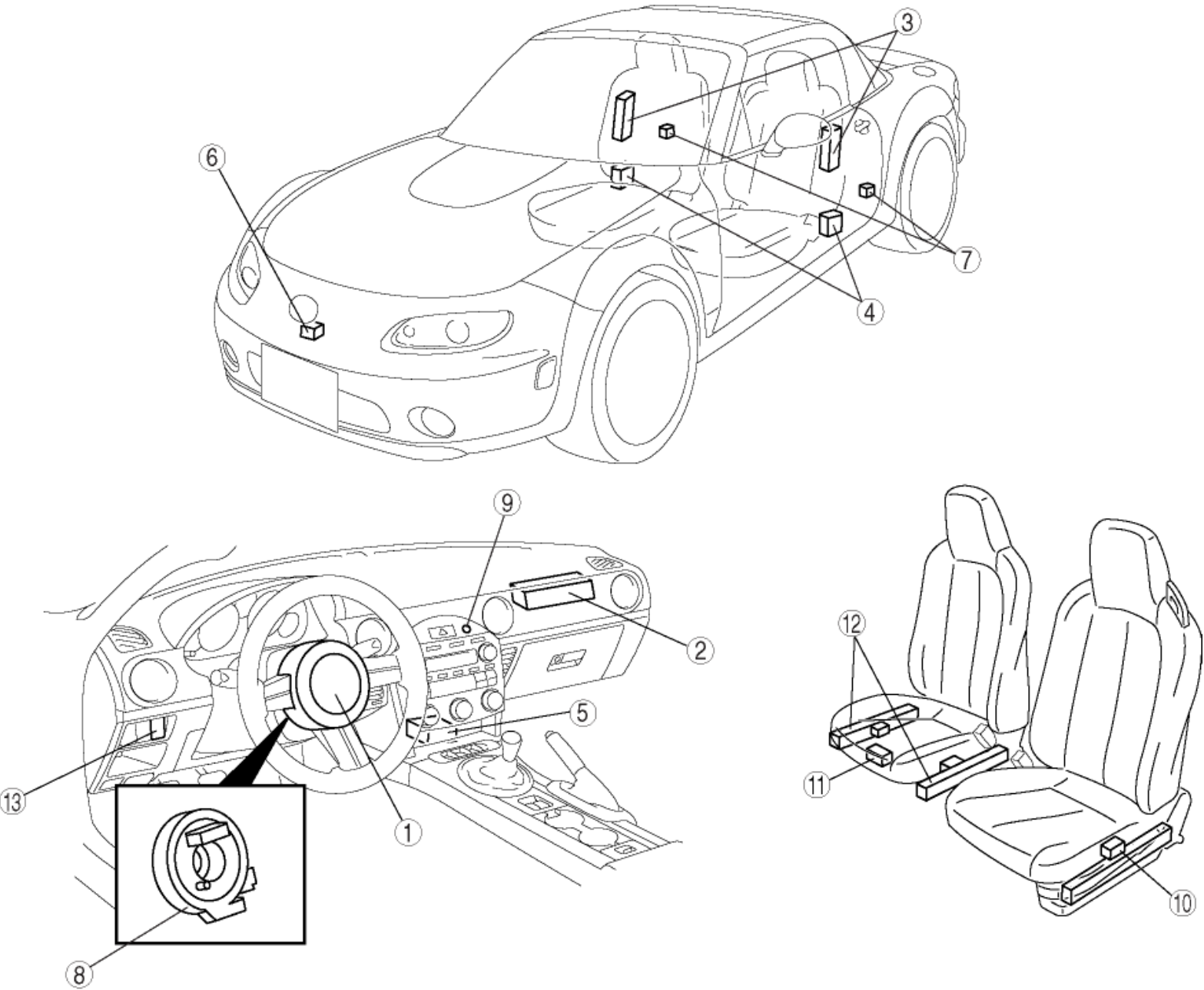
- Use the chart below verify the symptoms of the trouble in order to diagnose the appropriate area.

No.	Troubleshooting item	Description	Page
1	Air bag system warning light does not illuminate.	Malfunction in air bag system warning light circuit (short to ground).	(See <b>NO.1 AIR BAG SYSTEM WARNING LIGHT DOES NOT ILLUMINATE.</b> )
2	Air bag system warning light is illuminated constantly.	Malfunction in air bag system warning light circuit (open circuit or short to power supply).	(See <b>NO.2 AIR BAG SYSTEM WARNING LIGHT ILLUMINATES CONSTANTLY.</b> )



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LOCATION INDEX



1	Driver-side air bag module (See <a href="#">DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.</a> ) (See <a href="#">AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DEPLOYMENT PROCEDURES.</a> )
2	Passenger-side air bag module (See <a href="#">PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.</a> )

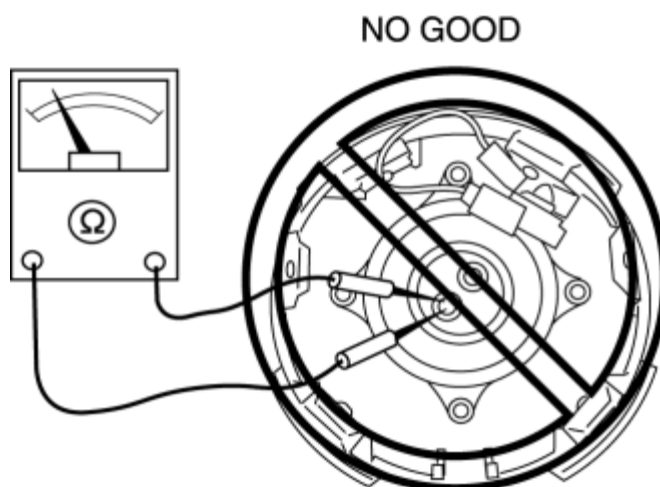
	(See <a href="#">AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DEPLOYMENT PROCEDURES.</a> )
3	Side air bag module (See <a href="#">SIDE AIR BAG MODULE REMOVAL/INSTALLATION.</a> ) (See <a href="#">AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DEPLOYMENT PROCEDURES.</a> )
4	Pre-tensioner seat belt (See <a href="#">AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DEPLOYMENT PROCEDURES.</a> )
5	SAS control module (See <a href="#">SAS CONTROL MODULE REMOVAL/INSTALLATION.</a> )
6	Crash zone sensor (See <a href="#">CRASH ZONE SENSOR REMOVAL/INSTALLATION.</a> )
7	Side air bag sensor (See <a href="#">SIDE AIR BAG SENSOR REMOVAL/INSTALLATION.</a> )
8	Clock spring (See <a href="#">CLOCK SPRING REMOVAL/INSTALLATION.</a> ) (See <a href="#">CLOCK SPRING INSPECTION.</a> ) (See <a href="#">CLOCK SPRING ADJUSTMENT.</a> )
9	Passenger air bag deactivation (PAD) indicator (See <a href="#">PASSENGER AIR BAG DEACTIVATION (PAD) INDICATOR REMOVAL/INSTALLATION.</a> )
10	Seat track position sensor (See <a href="#">SEAT TRACK POSITION SENSOR REMOVAL/INSTALLATION.</a> )
11	Seat weight sensor control module (See <a href="#">SEAT WEIGHT SENSOR CONTROL MODULE REMOVAL/INSTALLATION.</a> )
12	Seat weight sensor (See <a href="#">SEAT WEIGHT SENSOR CALIBRATION.</a> ) (See <a href="#">SEAT WEIGHT SENSOR INSPECTION.</a> )
13	Passenger air bag deactivation (PAD) switch (See <a href="#">PASSENGER AIR BAG DEACTIVATION (PAD) SWITCH REMOVAL/INSTALLATION.</a> )

## 2008 - MX-5 - Restraints

### AIR BAG SYSTEM SERVICE WARNINGS

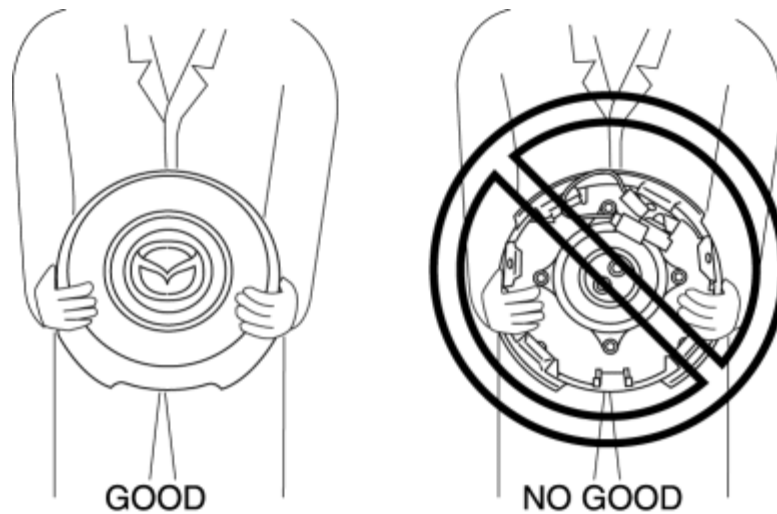
#### Air Bag Module Inspection

- Inspecting an air bag module using a tester can operate (deploy) the air bag module, which may cause serious injury. Do not use a tester to inspect an air bag module. Always use the on-board diagnostic function to diagnose the air bag module for malfunctions.

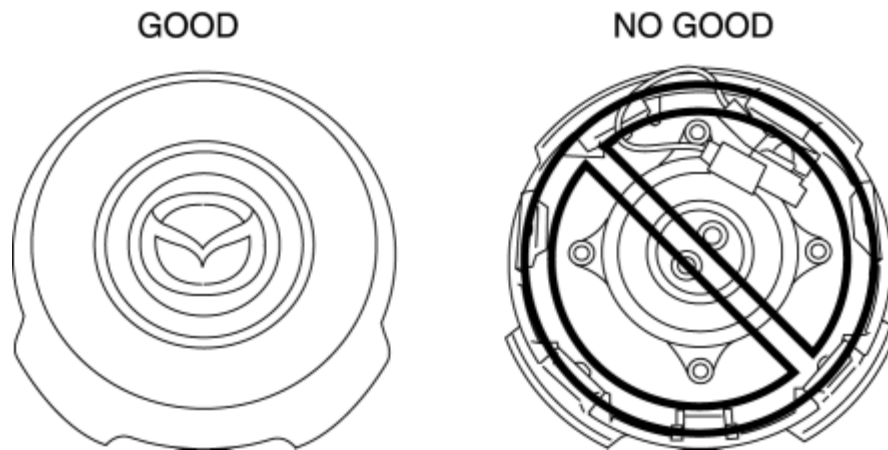


#### Air Bag Module Handling

- Before removing the air bag module or disconnecting the air bag module connector, always turn the ignition switch to the LOCK position, disconnect the negative battery cable, and then wait for 1 min or more to allow the backup power supply of the SAS control module to deplete its stored power.
- Handling a live (undeployed) air bag module that is pointed toward your body could result in serious injury if the air bag module were to accidentally operate (deploy). When carrying a live (undeployed) air bag module, point the deployment surface away from your body to lessen the chance of injury in case it operates (deploys).



- A live (undeployed) air bag module placed with its deployment surface to ground is dangerous. If the air bag module were to accidentally operate (deploy), it could cause serious injury. Always place a live (undeployed) air bag module with its deployment surface up.



### Side Air Bag Module Handling

- When a side air bag module operates (deploys) due to a collision, the interior of the seat (pad, frame, trim) may become damaged. If a side air bag does not operate (deploy) normally from a seat that has been reused, a serious accident may result. After a side air bag has operated (deployed), always replace both the side air bag module and the seat with new parts. After servicing, verify that the seat operates normally and that the wiring harness is not caught.

### Seat Weight Sensor Handling

- The passenger-side seat and the seat weight sensor may become deformed or otherwise damaged due to operation (deployment) of the front or side air bag in an accident. This may cause the passenger sensing function to operate improperly and result in a serious accident. Always replace the passenger seat and seat weight sensor with new ones after the front or side air bags have operated (deployed). After servicing, verify that the seat operates normally and that the wiring harness is not caught. If the collision is not hard enough to cause

the front or side air bags to operate (deploy), inspect the seat weight sensor and replace it if there is any malfunction.

### **SAS Control Module Handling**

- Removing the SAS control module or disconnecting the SAS control module connector with the ignition switch at the ON position can activate the sensor in the SAS control module and operate (deploy) the air bags and pre-tensioner seat belts, which may cause serious injury. Before removing the SAS control module or disconnecting the SAS control module connector, always turn the ignition switch to the LOCK position, disconnect the negative battery cable, and then wait for 1 min or more to allow the backup power supply of the SAS control module to deplete its stored power.
- Connecting the SAS control module connector with the SAS control module not securely fixed to the vehicle is dangerous. The sensor in the SAS control module could send an electrical signal to the air bag modules and pre-tensioner seat belts. This will operate (deploy) the air bags and pre-tensioner seat belts, which may result in serious injury. Therefore, before connecting the connector, securely fix the SAS control module to the vehicle.
- Because a sensor is built into the SAS control module, once the air bags and pre-tensioner seat belts have operated (deployed) due to a collision or other causes, the SAS control module must be replaced with a new one even if the used one does not have any visible external damage or deformation. The used SAS control module may have been damaged internally, which may cause improper operation. If the SAS control module is reused, the air bags and pre-tensioner seat belts may not operate (deploy) normally, which could result in a serious accident. Always replace the SAS control module with a new one. The SAS control module cannot be bench-checked or self-checked.

### **Crash Zone Sensor Handling**

- Removing the crash zone sensor or disconnecting the crash zone sensor connector with the ignition switch at the ON position can activate the crash zone sensor and operate (deploy) the air bags and pre-tensioner seat belts, which may cause serious injury. Before removing the crash zone sensor or disconnecting the crash zone sensor connector, always turn the ignition switch to the LOCK position, disconnect the negative battery cable, and then wait for 1 min or more to allow the backup power supply of the SAS control module to deplete its stored power.
- If the crash zone sensor is subjected to shock or the sensor is disassembled, the air bags and pre-tensioner seat belts may accidentally operate (deploy) and cause injury, or the system may fail to operate normally and cause a serious accident. Do not subject the crash zone sensor to shock or disassemble the sensor.
- Because a sensor is built into the crash zone sensor, once the air bags and pre-tensioner seat belts have operated (deployed) due to a collision or other causes, the crash zone sensor must be replaced with a new one even if the used one does not have any visible external damage or deformation. If the crash zone sensor is reused, the air bags and pre-tensioner seat belts may not operate (deploy) normally, which could result in a serious accident. Always replace the

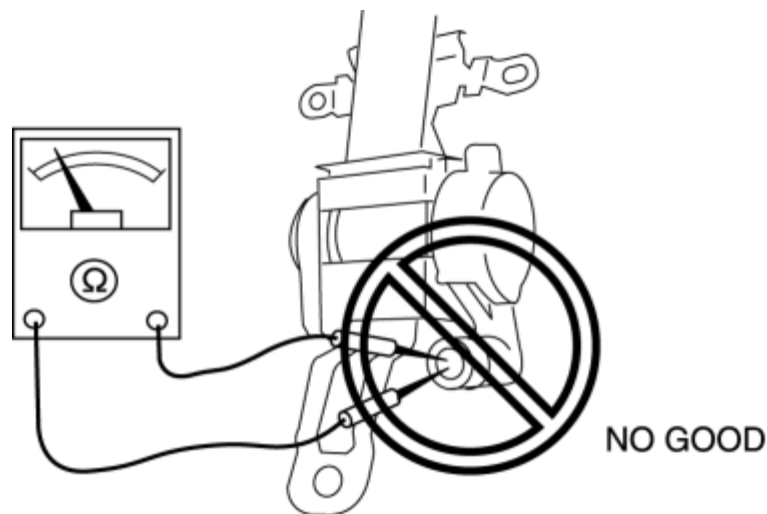
crash zone sensor with a new one. The crash zone sensor cannot be bench-checked or self-checked.

### Side Air Bag Sensor Handling

- Removing the side air bag sensor or disconnecting the side air bag sensor connector with the ignition switch at the ON position can activate the side air bag sensor and operate (deploy) the side air bag, which may cause serious injury. Before removing the side air bag sensor or disconnecting the side air bag sensor connector, always turn the ignition switch to the LOCK position, disconnect the negative battery cable, and then wait for 1 min or more to allow the backup power supply of the SAS control module to deplete its stored power.
- If the side air bag sensor is subjected to shock or the sensor is disassembled, the side air bag may accidentally operate (deploy) and cause injury, or the system may fail to operate normally and cause a serious accident. Do not subject the side air bag sensor to shock or disassemble the sensor.
- Because a sensor is built into the side air bag sensor, once the air bag has operated (deployed) due to a collision or other causes, the side air bag sensor must be replaced with a new one even if the used one does not have any visible external damage or deformation. If the side air bag sensor is reused, the side air bag may not operate (deploy) normally, which could result in a serious accident. Always replace the side air bag sensor with a new one. The side air bag sensor cannot be bench-checked or self-checked.

### Pre-tensioner Seat Belt Inspection

- Inspecting a pre-tensioner seat belt using a tester can operate (deploy) the pre-tensioner seat belt, which may cause serious injury. Do not use a tester to inspect a pre-tensioner seat belt. Always use the on-board diagnostic function to diagnose the pre-tensioner seat belt for malfunctions.

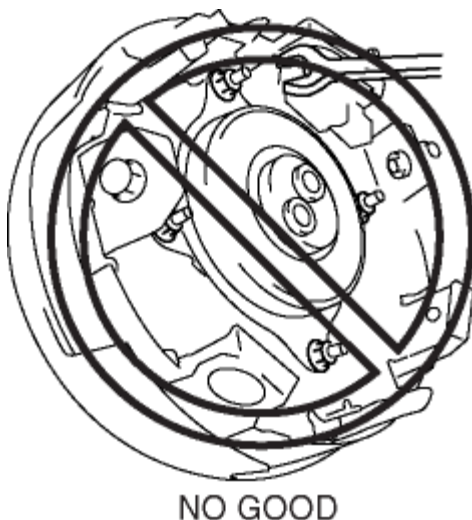


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### AIR BAG SYSTEM SERVICE CAUTIONS

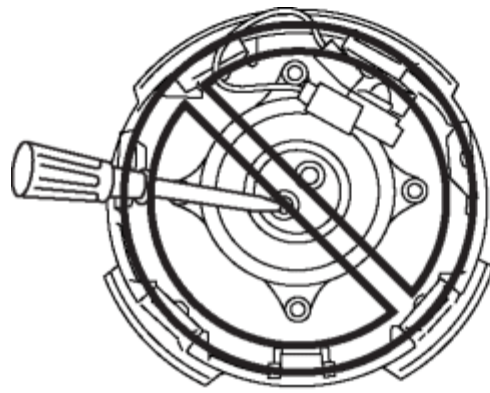
#### Air Bag System Component Disassembly

- Disassembling the air bag system components could cause it to not operate (deploy) normally. Never disassemble any air bag system components.



#### Air Bag Module, Pre-tensioner Seat Belt Handling

- Oil, grease, or water on the air bag modules may cause the air bags and pre-tensioner seat belts to fail to operate (deploy) in an accident. Never allow oil, grease, or water to get on the air bag modules or pre-tensioner seat belts.
- Inserting a screwdriver or similar object into the connector of an air bag module or a pre-tensioner seat belt may damage the connector and cause the air bag module or the pre-tensioner seat belt to operate (deploy) improperly, which may cause serious injury. Never insert any foreign objects into the air bag module or seat belt connectors.



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### Seat Weight Sensor Handling

- The seat weight sensor has a built-in strain gauge which may operate improperly if the sensor is dropped by itself or when installed to the seat. If it is dropped, replace the seat weight sensor with a new one.
- Oil, grease, or water on the seat weight sensor may cause the system to operate (deploy) improperly. Never allow oil, grease, or water to get on the seat weight sensor.
- Foreign material in the seat weight sensor components may cause the system to operate (deploy) improperly. Always make sure that no foreign material can get into the seat weight sensor.
- Disassembling the seat weight sensor, or tightening any of the nuts and bolts installed to the sensor body may cause it to operate (deploy) improperly. Never disassemble the seat weight sensor or tighten any of the nuts or bolts installed to the body of the sensor.

### Air Bag Module, Pre-tensioner Seat Belt Reuse

- Even if an air bag module or a pre-tensioner seat belt does not operate (deploy) in a collision and does not have any external signs of damage, it may have been damaged internally, which may cause improper operation. Before reusing a live (undeployed) air bag module and the pre-tensioner seat belts, always use the on-board diagnostic to diagnose the air bag module and the pre-tensioner seat belts to verify that they have no malfunction.

### Air Bag Wiring Harness Repair

- Incorrectly repairing an air bag wiring harness can accidentally operate (deploy) the air bag module and pre-tensioner seat belts. If a problem is found in the air bag wiring harness, always replace the wiring harness with a new one.





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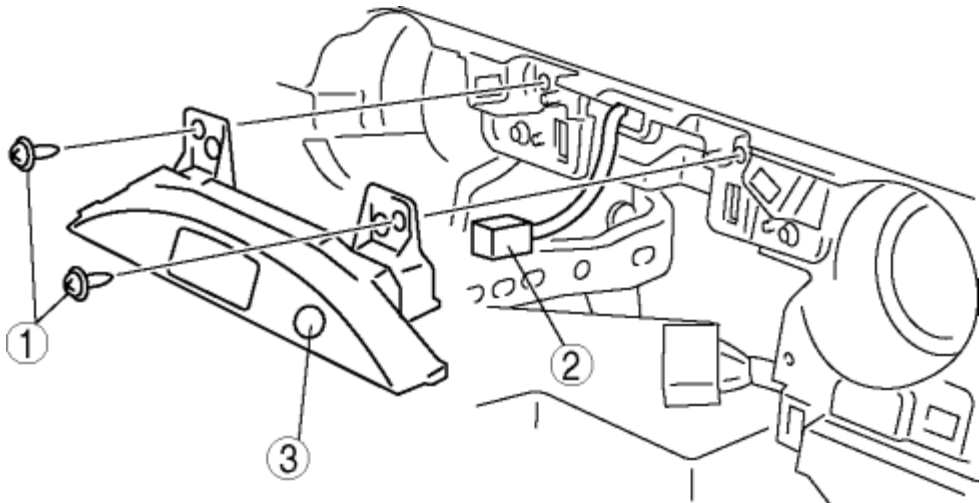
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PASSENGER AIR BAG DEACTIVATION (PAD) INDICATOR REMOVAL/INSTALLATION

- 1. Remove the battery cover.
- 2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
- 3. Remove the following parts:
  - a. Side wall (See [SIDE WALL REMOVAL/INSTALLATION.](#))
  - b. Center panel unit (See [CENTER PANEL UNIT REMOVAL/INSTALLATION.](#))
  - c. Glove compartment (See [GLOVE COMPARTMENT REMOVAL/INSTALLATION.](#))
  - d. Decoration panel (See [DECORATION PANEL REMOVAL/INSTALLATION.](#))
- 4. Remove in the order indicated in the table.



1	Screw
2	Connector
3	Passenger air bag deactivation (PAD) indicator

- 5. Install in the reverse order of removal.



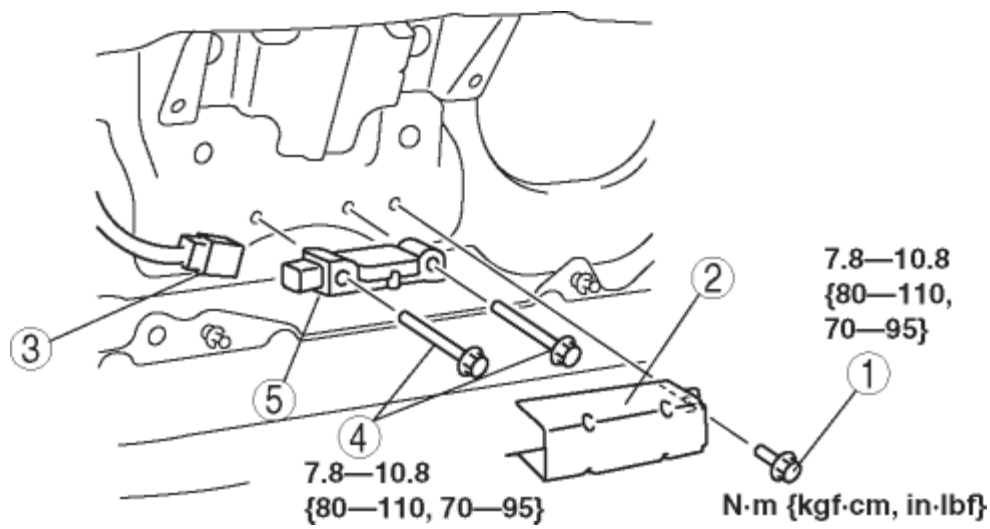
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CRASH ZONE SENSOR REMOVAL/INSTALLATION

WARNING:

- Handling the crash zone sensor improperly can accidentally deploy the air bags and pre-tensioner seat belts, which may seriously injure you. Read the air bag system service warnings and cautions before handling the crash zone sensor. (See **AIR BAG SYSTEM SERVICE WARNINGS.**) (See **AIR BAG SYSTEM SERVICE CAUTIONS.**)

1. Turn the ignition switch to the LOCK position.
2. Remove the battery cover.
3. Disconnect the negative battery cable and wait for **1 min or more**. (See **BATTERY REMOVAL/INSTALLATION [LF].**)
4. Remove the front bumper. (See **FRONT BUMPER REMOVAL/INSTALLATION.**)
5. Remove the fresh-air duct. (See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [LF].**)
6. Remove in the order indicated in the table.



1	Bolt A
2	Cover
3	Connector
4	Bolt B

7. Install in the reverse order of removal.
8. Turn the ignition switch to the ON position.
9. Verify that the air bag system warning light illuminates for **approx. 6 s** and goes out.
  - If the air bag system warning light does not operate normally, refer to the on-board diagnostic system (air bag system) and perform inspection of the system.

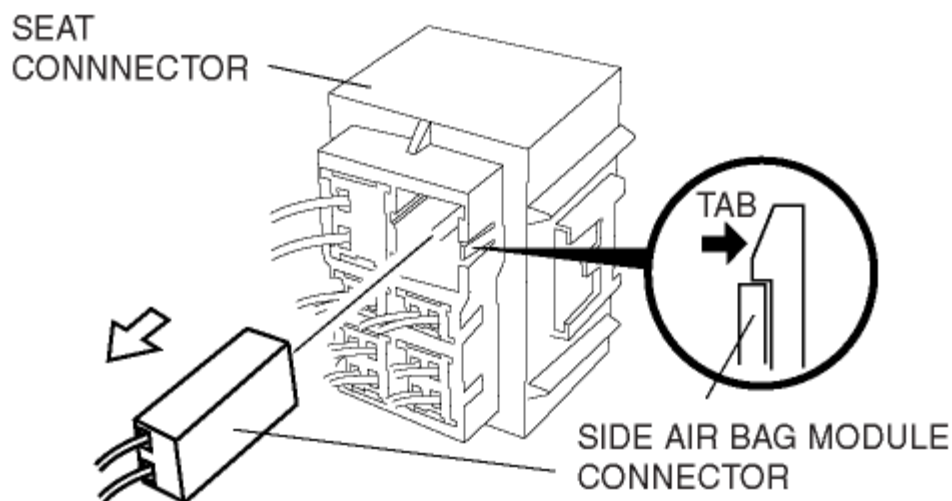
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### SIDE AIR BAG MODULE REMOVAL/INSTALLATION

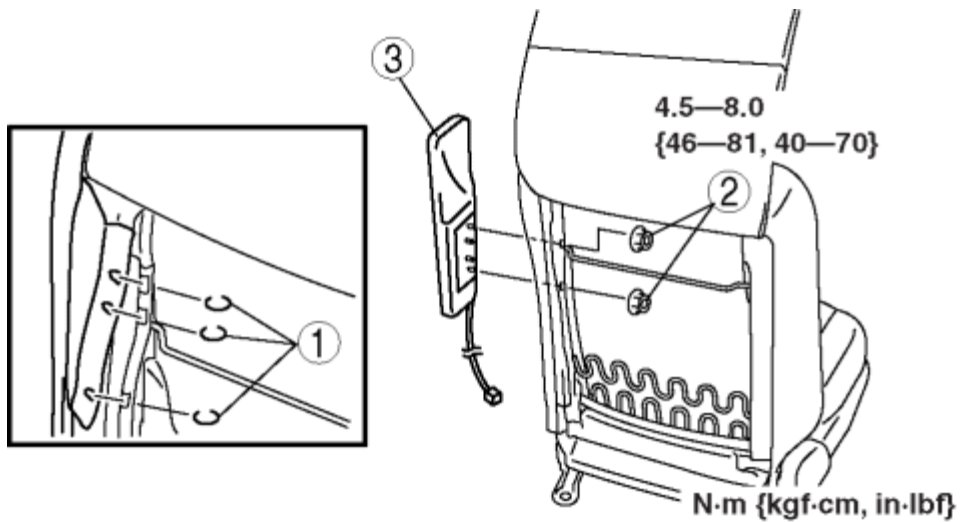
#### WARNING:

- Handling the air bag module improperly can accidentally operate (deploy) the air bag module, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag module. (See [AIR BAG SYSTEM SERVICE WARNINGS.](#)) (See [AIR BAG SYSTEM SERVICE CAUTIONS.](#))
- If the side air bag module is installed with debris in the seat back, the foreign material may be scattered when the side air bag module operates (deploys), causing injury. Verify that there is no foreign material in the seat back before installing the side air bag module.

1. Turn the ignition switch to the LOCK position.
2. Remove the battery cover.
3. Disconnect the negative battery cable and wait for **1 min or more**. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
4. Remove the seat. (See [SEAT REMOVAL/INSTALLATION.](#))
5. Detach the tab as shown in the figure and remove the connector from the seat connector.



6. Partially peel back the seat back trim.
7. Partially peel back the seat back pad.
8. Remove in the order indicated in the table.



1	Hook
2	Nut
3	Side air bag module

9. Install in the reverse order of removal.
10. Turn the ignition switch to the ON position.
11. Verify that the air bag system warning light illuminates for **approx. 6 s** and goes out.
  - If the air bag system warning light does not operate normally, refer to the on-board diagnostic system (air bag system) and perform inspection of the system.

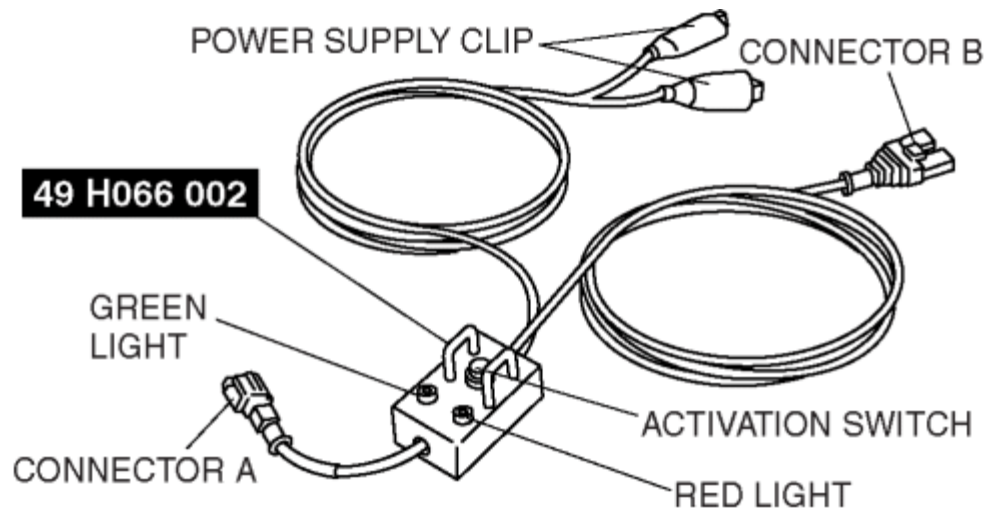
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INSPECTION OF SST (DEPLOYMENT TOOL)

1. Before using the **SST** (49 H066 002), inspect its operation.



Inspection Procedure

1. Follow the steps below to inspect the **SST** (49 H066 002).
- If not as indicated in the table, replace the **SST** (49 H066 002) because it has a malfunction.

**WARNING:**

- Do not use a malfunctioning SST (49 H066 002), otherwise it could cause the air bag module or pre-tensioner seat belt to accidentally operate (deploy).

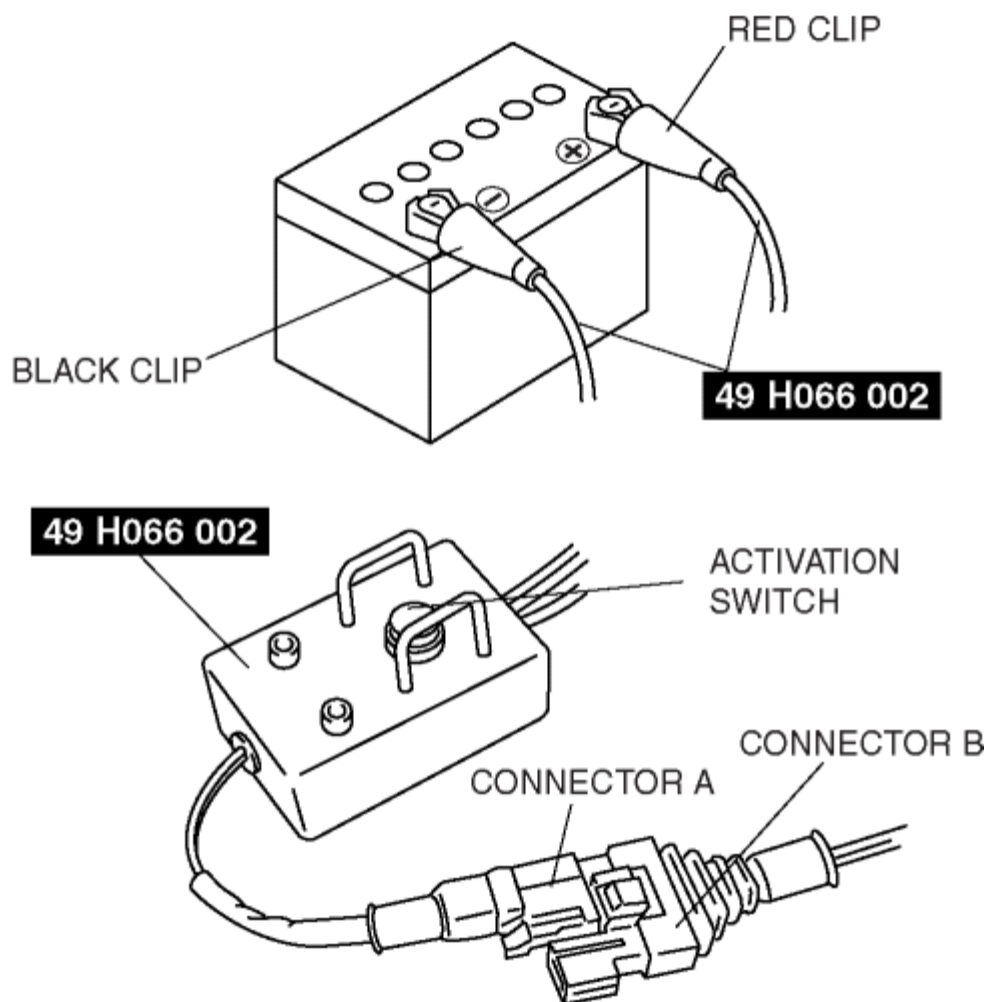
**CAUTION:**

- Because the permissible voltage for the SST (49 H066 002) is 12 V, do not connect a 24 V power source because it will damage the SST. Always connect only a 12 V power source.

Step	Inspection procedure	Light condition	
		Green	Red
1	Connect the power supply red clip to the positive battery terminal, and the black clip to the negative battery terminal.	On	Off



2	Connect connectors A and B.	Off	On
3	Press the activation switch.	On	Off



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## 2008 - MX-5 - Restraints

### AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DEPLOYMENT PROCEDURES

#### WARNING:

- A live (undeployed) air bag module or pre-tensioner seat belt may accidentally operate (deploy) when it is disposed of and cause serious injury. Do not dispose of a live (undeployed) air bag module and pre-tensioner seat belt. If the SSTs (Deployment tool and Adapter harness) are not available, consult the nearest Mazda representative for assistance.

#### CAUTION:

- Deploying the air bag modules and pre-tensioner seat belts inside the vehicle may cause damage to the vehicle interior. When the vehicle is not to be scrapped, always deploy the air bag modules and pre-tensioner seat belts outside the vehicle.
- If the vehicle is to be scrapped, or when disposing of any air bag modules or pre-tensioner seat belts, operate (deploy) them inside the vehicle by following the deployment procedure below and using the **SST** (Deployment tool).
- When disposing of an operated (deployed) air bag module and pre-tensioner seat belt, refer to "AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DISPOSAL PROCEDURES".

#### Deployment Procedure for Inside of Vehicle

1. Inspect the **SST** (Deployment tool). (See [INSPECTION OF SST \(DEPLOYMENT TOOL\)](#).)
2. Move the vehicle to an open space, away from strong winds, and close all of the vehicle doors and windows.
3. Turn the ignition switch to the LOCK position.
4. Remove the battery cover.
5. Disconnect the negative battery cable and wait for **1 min or more**. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
6. Follow the procedure below for operating (deploying) the applicable air bag module or pre-tensioner seat belt.

#### Driver-side Air Bag Module

#### WARNING:

- The driver-side air bag module is a dual inflator type. If one inflator is forced to operate (deploy), the other may operate (deploy) accidentally. To prevent injury while disposing of the air bag module, make sure to operate (deploy) both driver-side air bag module inflators simultaneously, following the procedure below.

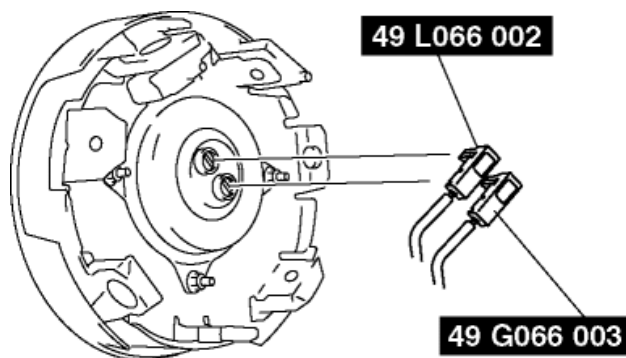
#### NOTE:

- The **SSTs**, two types of adapter harnesses (for inflators No.1 and No.2) and two deployment tools are to be used to operate (deploy) the driver-side air bag module.

1. Remove the driver-side air bag module.

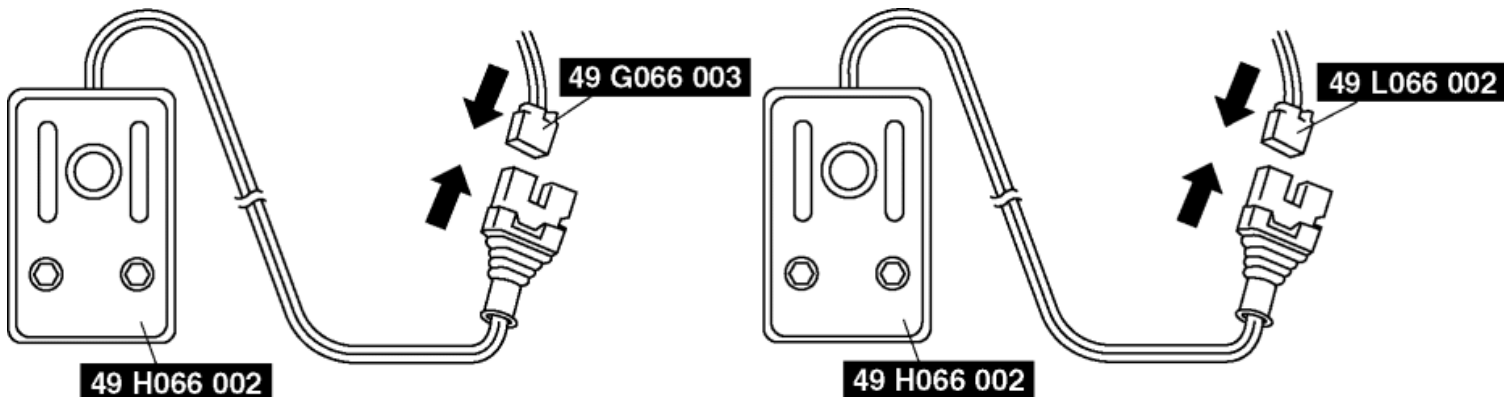
(See [DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION](#).)

2. Connect the **SSTs** (Adapter harness) to the driver-side air bag module as shown in the figure.



3. Install the driver-side air bag module. (See [DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION](#).)

4. Connect the **SSTs** (Deployment tool) to the **SSTs** (Adapter harness).

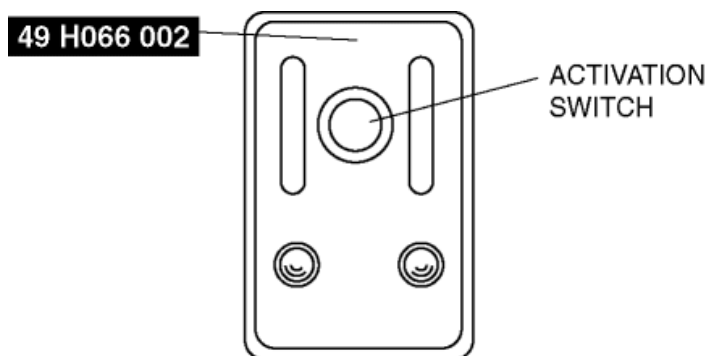


5. Connect both **SSTs** (Deployment tool) to the battery. Connect the power supply red clip to the positive battery terminal, and the black clip to the negative battery terminal.

6. Verify that the red lamp on both **SSTs** (Deployment tool) is illuminated.

7. Verify that all persons are standing **at least 6 m {20 ft}** away from the vehicle.

8. Press the activation switch on the **SST** (Deployment tool) connected with 49 L066 002 (a yellow connector) of the **SST** (Adapter harness), and **after 3 s**, press the activation switch on the other **SST** (Deployment tool) to operate (deploy) the air bag module (both inflators).



#### **WARNING:**

- Verify that air bag module operation (explosive) sound occurs twice. If no operation (explosive) sound was heard or a single operation (explosive) sound was heard, both inflators would not have operated (deployed) properly. This may cause serious injury if the air bag module operates (deploy) unexpectedly. If the two operation (explosive) sounds are not heard, perform Step 8 again. If a total of two operation (explosive) sounds cannot be verified even though Step 8 is performed again, leave the air bag module alone for 30 min or more before approaching it again.
- The air bag module is very hot immediately after it is operated (deployed). You can get burned. Do not touch the air bag module for at least 15 min after deployment.

9. Disconnect the **SSTs** (Deployment tool) from the **SSTs** (Adapter harness).

## Passenger-side Air Bag Module

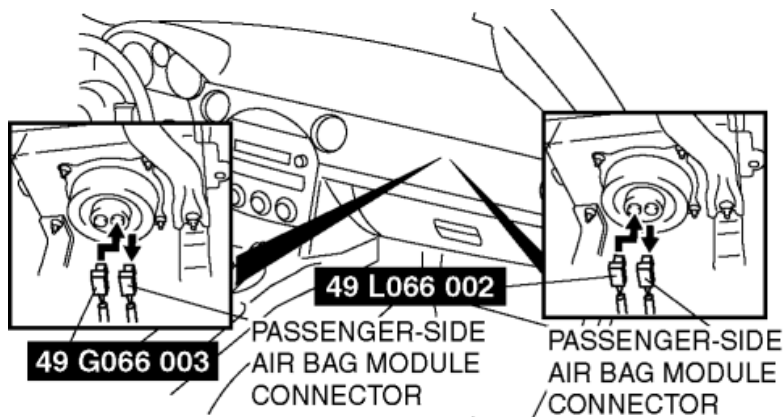
### WARNING:

- The passenger-side air bag module is a dual inflator type. If one inflator is forced to operate (deploy), the other may operate (deploy) accidentally. To prevent injury while disposing of the air bag module, make sure to operate (deploy) both passenger-side air bag module inflators simultaneously, following the procedure below.

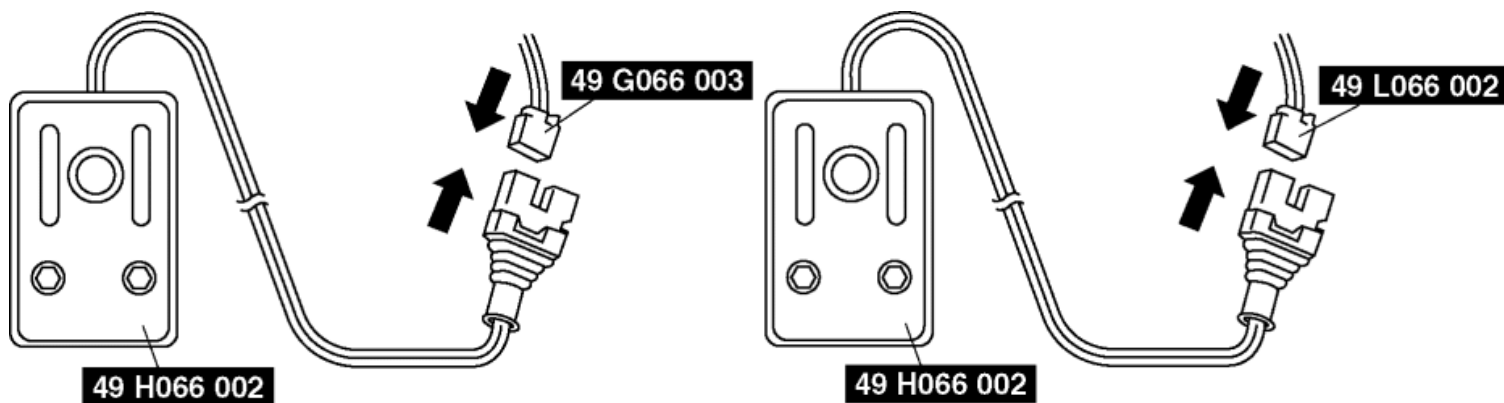
### NOTE:

- The **SSTs**, two types of adapter harnesses (for inflators No.1 and No.2) and two deployment tools are to be used to operate (deploy) the passenger-side air bag module.

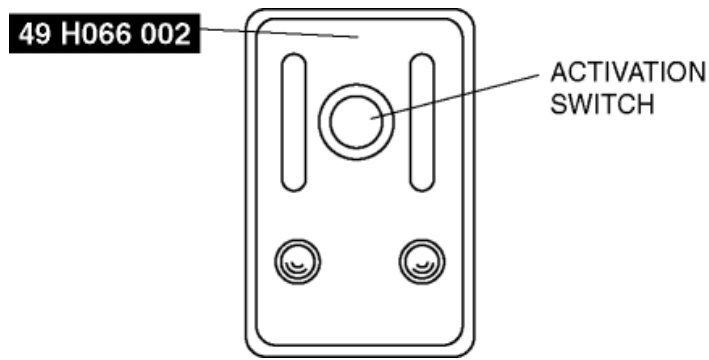
1. Remove the glove compartment. (See [GLOVE COMPARTMENT REMOVAL/INSTALLATION](#).)
2. Disconnect the passenger-side air bag module connector.
3. Connect the **SSTs** (Adapter harness) to the passenger-side air bag module as shown in the figure.



4. Connect the **SSTs** (Deployment tool) to the **SSTs** (Adapter harness).



5. Connect both **SSTs** (Deployment tool) to the battery. Connect the power supply red clip to the positive battery terminal, and the black clip to the negative battery terminal.
6. Verify that the red lamp on both **SSTs** (Deployment tool) is illuminated.
7. Verify that all persons are standing **at least 6 m {20 ft}** away from the vehicle.
8. Press the activation switch on the **SST** (Deployment tool) connected with 49 L066 002 (a yellow connector) of the **SST** (Adapter harness), and **after 3 s**, press the activation switch on the other **SST** (Deployment tool) to operate (deploy) the air bag module (both inflators).



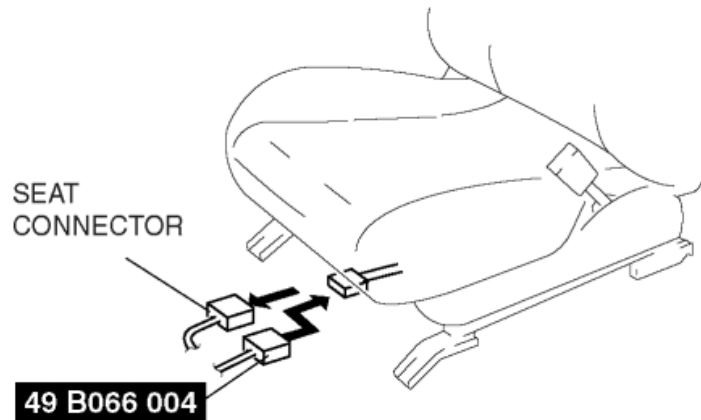
**WARNING:**

- Verify that air bag module operation (explosive) sound occurs twice. If no operation (explosive) sound was heard or a single operation (explosive) sound was heard, both inflators would not have operated (deployed) properly. This may cause serious injury if the air bag module operates (deploy) unexpectedly. If the two operation (explosive) sounds are not heard, perform Step 8 again. If a total of two operation (explosive) sounds cannot be verified even though Step 8 is performed again, leave the air bag module alone for 30 min or more before approaching it again.
- The air bag module is very hot immediately after it is operated (deployed). You can be burned. Do not touch the air bag module for at least 15 min after deployment.

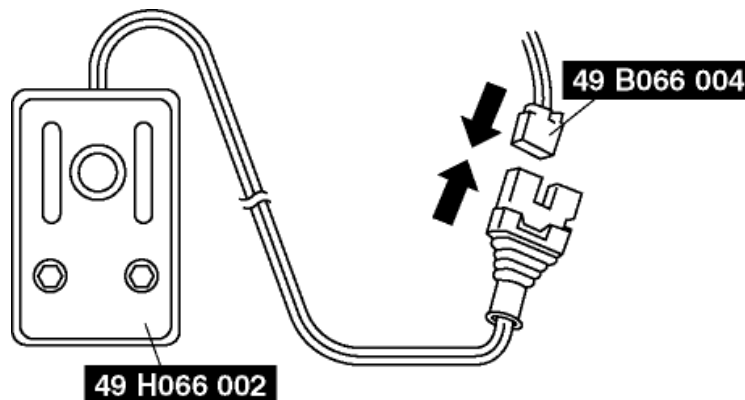
9. Disconnect the **SSTs** (Deployment tool) from the **SSTs** (Adapter harness).

**Side Air Bag Module**

1. Disconnect the seat connector.
2. Connect the **SST** (Adapter harness) to the side air bag module as shown in the figure.



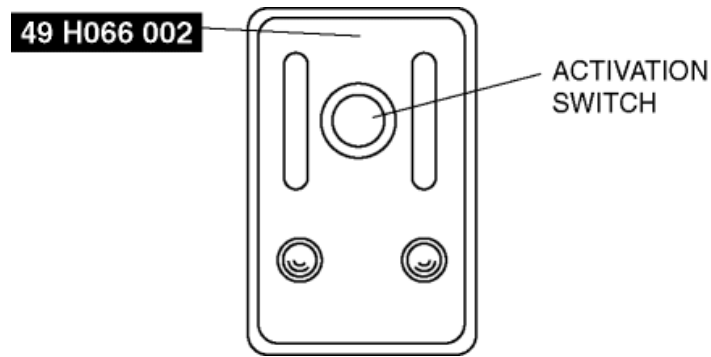
3. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).



4. Connect the **SST** (Deployment tool) to the battery. Connect the power supply red clip to the positive battery terminal, and the black clip to the negative battery terminal.

5. Verify that the red lamp on the **SST** (Deployment tool) is illuminated.

6. Verify that all persons are standing **at least 6 m {20 ft}** away from the vehicle.
7. Press the activation switch on the **SST** (Deployment tool) to operate (deploy) the side air bag module.



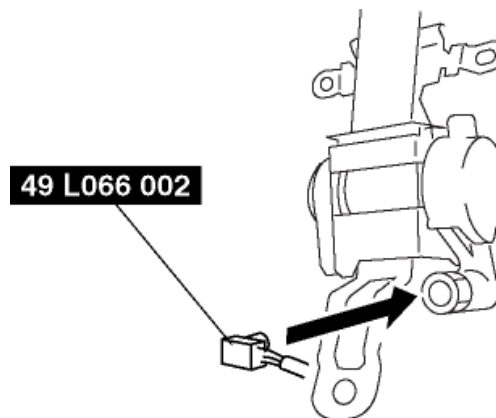
8. Disconnect the **SSTs** (Deployment tool) from the **SSTs** (Adapter harness).

### Pre-tensioner Seat Belt

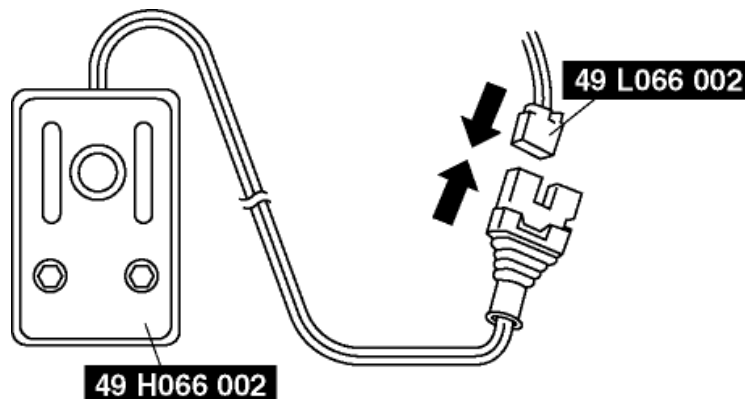
1. Remove the back trim.

(See [BACK TRIM REMOVAL/INSTALLATION.](#))

2. Remove the pre-tensioner seat belt and connect the **SST** (Adapter harness) as shown in the figure. (See [SEAT BELT REMOVAL/INSTALLATION.](#))

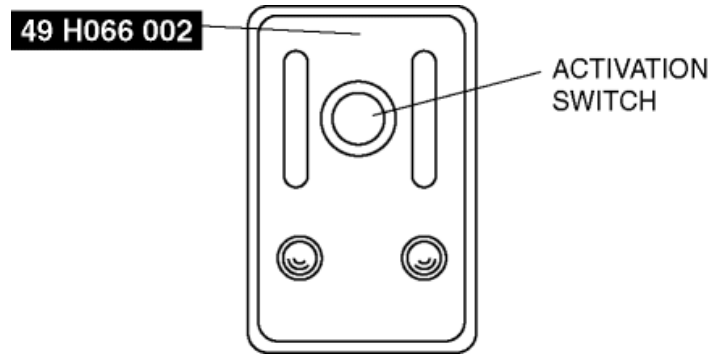


3. Install the pre-tensioner seat belt.
4. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).



5. Connect the **SST** (Deployment tool) to the battery. Connect the power supply red clip to the positive battery terminal, and the black clip to the negative battery terminal.
6. Verify that the red lamp on the **SST** (Deployment tool) is illuminated.
7. Verify that all persons are standing **at least 6 m {20 ft}** away from the vehicle.

8. Press the activation switch on the **SST** (Deployment tool) to operate (deploy) the pre-tensioner seat belt.



9. Disconnect the **SSTs** (Deployment tool) from the **SSTs** (Adapter harness).

### Deployment Procedure for Outside of Vehicle

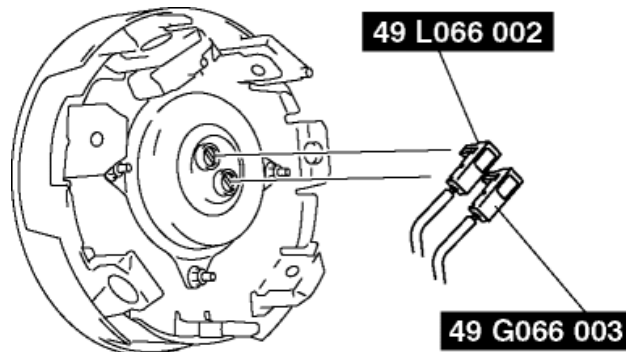
1. Inspect the **SST** (Deployment tool).
- (See [INSPECTION OF SST \(DEPLOYMENT TOOL\)](#).)
2. Turn the ignition switch to the LOCK position.
3. Remove the battery cover.
4. Disconnect the negative battery cable and wait for **1 min or more**. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
5. Follow the procedure below for operating (deploying) the applicable air bag module or pre-tensioner seat belt.

### Driver-side Air Bag Module

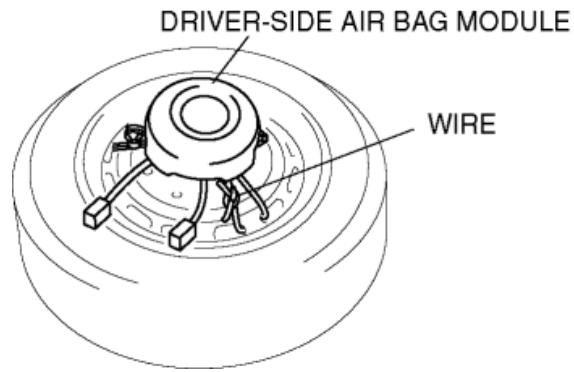
#### WARNING:

- The driver-side air bag module is a dual inflator type. If one inflator is forced to operate (deploy), the other may operate (deploy) accidentally. To prevent injury while disposing of the air bag module, make sure to operate (deploy) both driver-side air bag module inflators simultaneously, following the procedure below.

1. Remove the driver-side air bag module.
- (See [DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION](#).)
2. Connect the **SSTs** (Adapter harness) to the driver-side air bag module as shown in the figure.



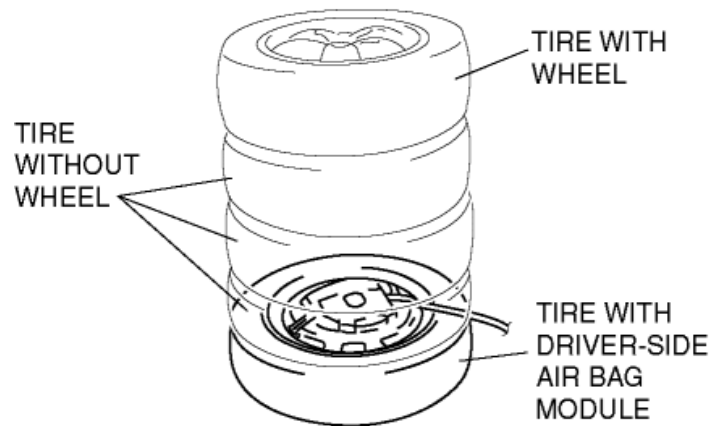
3. Place the driver-side air bag module on the center of the tire wheel with the padded surface facing up. To secure the air bag module to the tire wheel, wrap a wire (cross section **1.25 mm<sup>2</sup> {0.002 in<sup>2</sup>} or more**) through the wheel and the bolt installation holes of the air bag module **at least 4 times**.



**WARNING:**

- If the air bag module is not properly installed to the tire wheel, serious injury may occur when the module is operated (deployed). When installing the air bag module to the tire wheel, make sure the padded surface is facing up.

4. Stack three tires without wheels on top of the tire with the driver-side air bag module, and then stack another tire with a wheel on the very top.

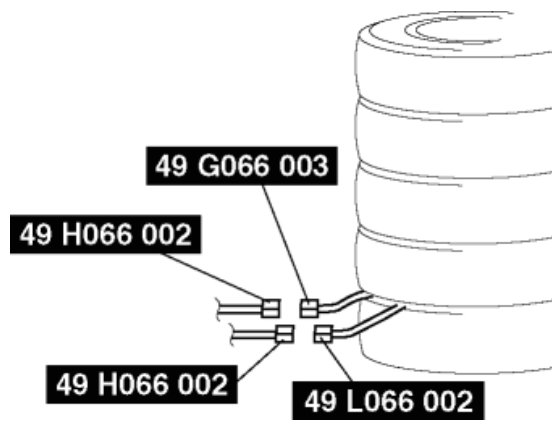


5. Secure the tires with wire.



6. Connect the **SSTs** (Deployment tool) to the **SSTs** (Adapter harness).



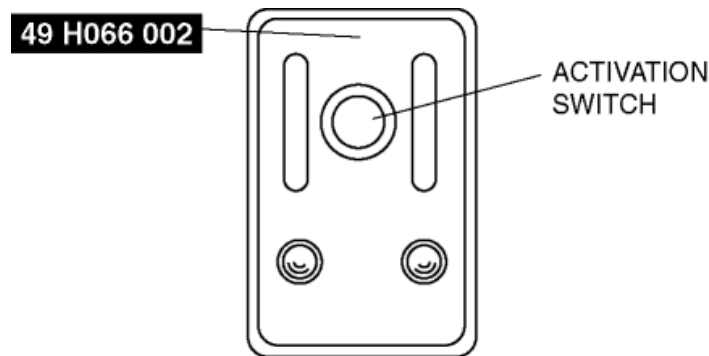


7. Connect both **SSTs** (Deployment tool) to the battery. Connect the power supply red clip to the positive battery terminal, and the black clip to the negative battery terminal.

8. Verify that the red lamp on both **SSTs** (Deployment tool) is illuminated.

9. Verify that all persons are standing **at least 6 m {20 ft}** away from the vehicle.

10. Press the activation switch on the **SST** (Deployment tool) connected with 49 L066 002 (a yellow connector) of the **SST** (Adapter harness), and **after 3 s**, press the activation switch on the other **SST** (Deployment tool) to operate (deploy) the air bag module (both inflators).



#### WARNING:

- Verify that air bag module operation (explosive) sound occurs twice. If no operation (explosive) sound was heard or a single operation (explosive) sound was heard, both inflators would not have operated (deployed) properly. This may cause serious injury if the air bag module operates (deploy) unexpectedly. If the two operation (explosive) sounds are not heard, perform Step 8 again. If a total of two operation (explosive) sounds cannot be verified even though Step 8 is performed again, leave the air bag module alone for 30 min or more before approaching it again.
- The air bag module is very hot immediately after it is operated (deployed). You can be burned. Do not touch the air bag module for at least 15 min after deployment.

11. Disconnect the **SSTs** (Deployment tool) from the **SSTs** (Adapter harness).

#### Passenger-side Air Bag Module

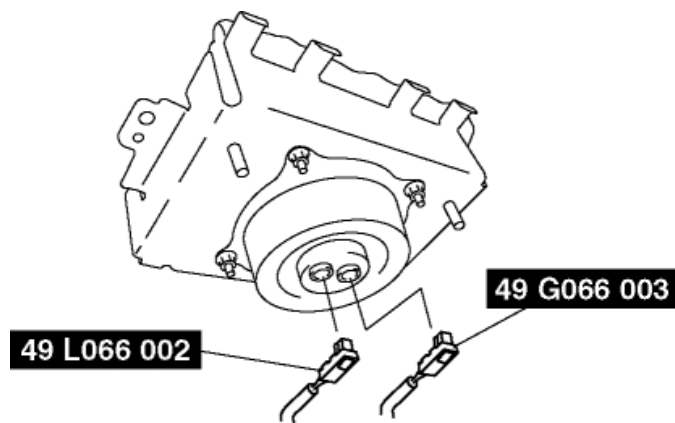
#### WARNING:

- The passenger-side air bag module is a dual inflator type. If one inflator is forced to operate (deploy), the other may operate (deploy) accidentally. To prevent injury while disposing of the air bag module, make sure to operate (deploy) both passenger-side air bag module inflators simultaneously, following the procedure below.

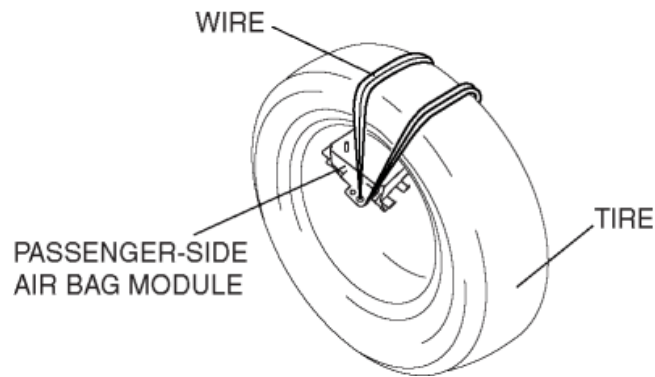
1. Remove the passenger-side air bag module.

(See [PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION](#).)

2. Connect the **SSTs** (Adapter harness) to the passenger-side air bag module as shown in the figure.



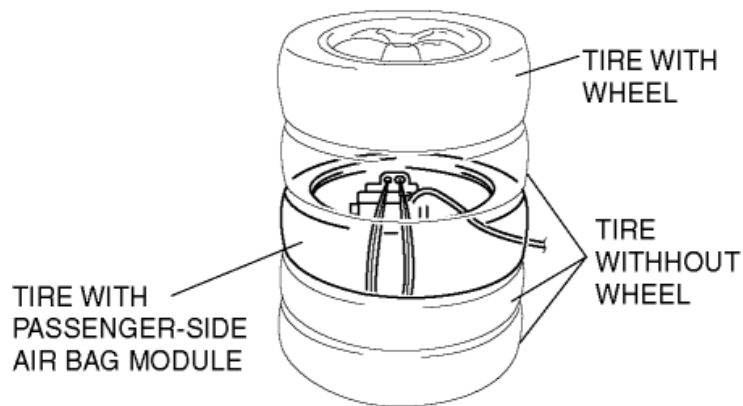
3. Place the padded surface of the passenger-side air bag module facing the center of the tire as shown in the figure. To secure the air bag module to the tire wheel, wrap a wire (cross section  $1.25 \text{ mm}^2$  {0.002 in<sup>2</sup>} or more) through the tire and the brackets **at least 4 times** as shown in the figure.



**WARNING:**

- If the air bag module is not properly secured to the tire, the tires may fall over by the impact of operation (deployment) and cause serious injury. To prevent this, secure the air bag module properly with the padded surface facing the center of the tire.

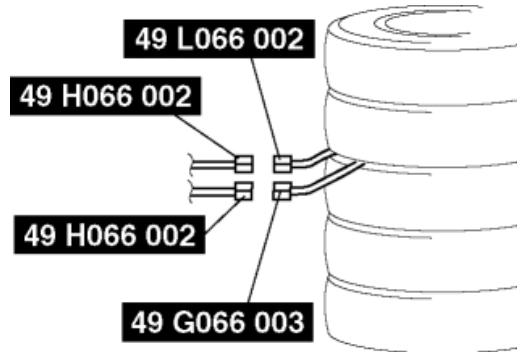
4. Stack the tire with the passenger-side air bag module on top of two tires without wheels. Stack a tire without a wheel on top of the tire with the passenger-side air bag module, and then stack another tire with a wheel on the very top.



5. Secure the tires with wire.



6. Connect the **SSTs** (Deployment tool) to the **SSTs** (Adapter harness).

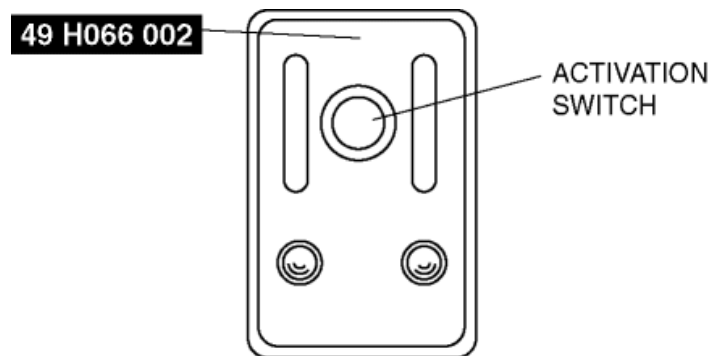


7. Connect both **SSTs** (Deployment tool) to the battery. Connect the power supply red clip to the positive battery terminal, and the black clip to the negative battery terminal.

8. Verify that the red lamp on both **SSTs** (Deployment tool) is illuminated.

9. Verify that all persons are standing **at least 6 m {20 ft}** away from the vehicle.

10. Press the activation switch on the **SST** (Deployment tool) connected with 49 L066 002 (a yellow connector) of the **SST** (Adapter harness), and **after 3 s**, press the activation switch on the other **SST** (Deployment tool) to operate (deploy) the air bag module (both inflators).



#### WARNING:

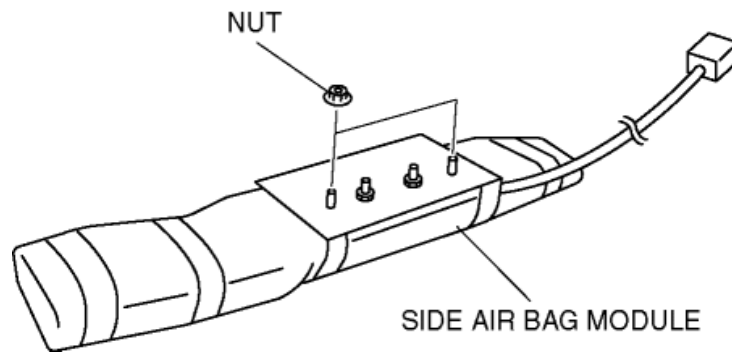
- Verify that air bag module operation (explosive) sound occurs twice. If no operation (explosive) sound was heard or a single operation (explosive) sound was heard, both inflators would not have operated (deployed) properly. This may cause serious injury if the air bag module operates (deploy) unexpectedly. If the two operation (explosive) sounds are not heard, perform Step 8 again. If a total of two operation (explosive) sounds cannot be verified even though Step 8 is performed again, leave the air bag module alone for 30 min or more before approaching it again.
- The air bag module is very hot immediately after it is operated (deployed). You can be burned. Do not touch the air bag module for at least 15 min after deployment.

11. Disconnect the **SSTs** (Deployment tool) from the **SSTs** (Adapter harness).

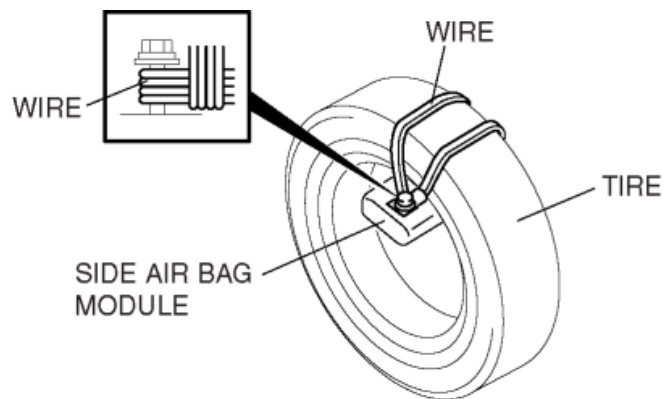
1. Remove the side air bag module.

(See [SIDE AIR BAG MODULE REMOVAL/INSTALLATION](#).)

2. Install the nuts to the side air bag module as shown in the figure, and connect the **SST** (Adapter harness).



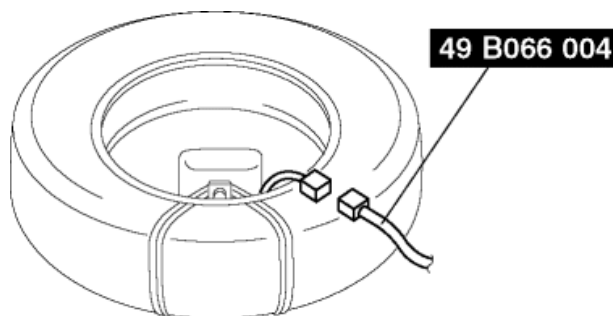
3. Place the padded surface of the side air bag module facing the center of the tire as shown in the figure. To secure the air bag module to the tire wheel, wrap a wire (cross section **1.25 mm<sup>2</sup> {0.002 in<sup>2</sup>} or more**) through the tire and around the bolts **at least 4 times**.



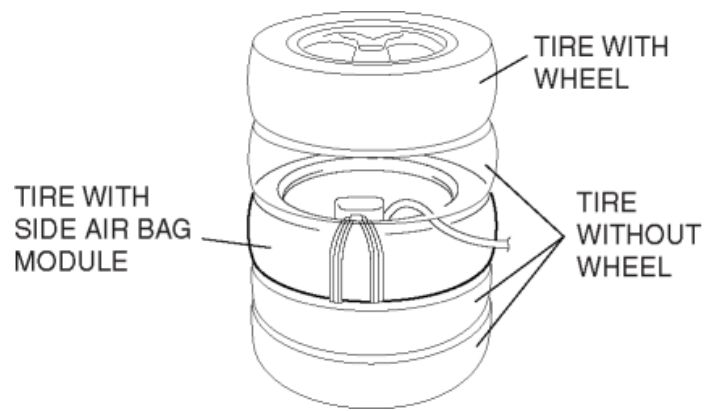
**WARNING:**

- If the air bag module is not properly secured to the tire, the tires may fall over by the impact of operation (deployment) and cause serious injury. To prevent this, secure the air bag module properly with the padded surface facing the center of the tire.

4. Connect the SST (Adapter harness) to the side air bag module as shown in the figure.



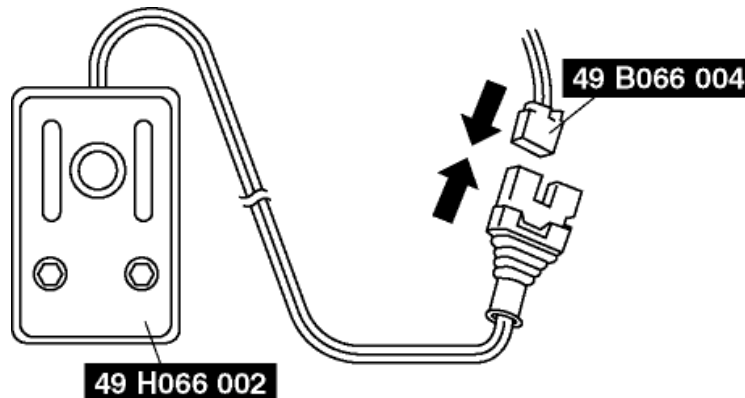
5. Stack the tire with the side air bag module on top of two tires without wheels. Stack a tire without a wheel on top of the tire with the side air bag module, and then stack another tire with a wheel on the very top.



6. Secure the tires with wire.



7. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).

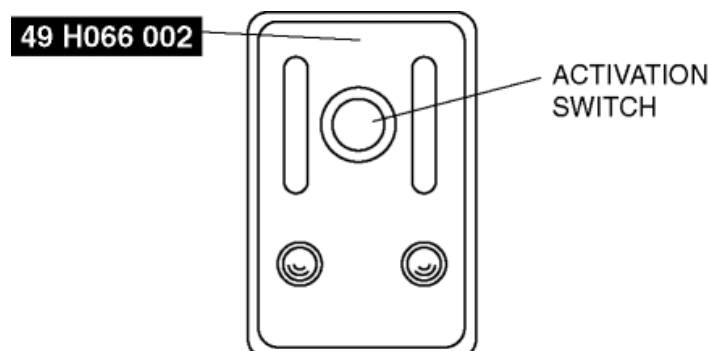


8. Connect the **SST** (Deployment tool) to the battery. Connect the power supply red clip to the positive battery terminal, and the black clip to the negative battery terminal.

9. Verify that the red lamp on the **SST** (Deployment tool) is illuminated.

10. Verify that all persons are standing **at least 6 m {20 ft}** away from the vehicle.

11. Press the activation switch on the **SST** (Deployment tool) to operate (deploy) the side air bag module.



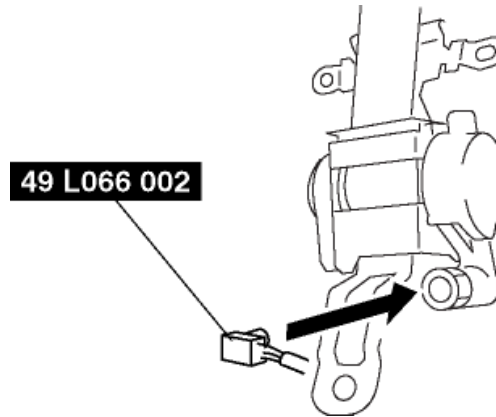
12. Disconnect the **SSTs** (Deployment tool) from the **SSTs** (Adapter harness).

### Pre-tensioner Seat Belt

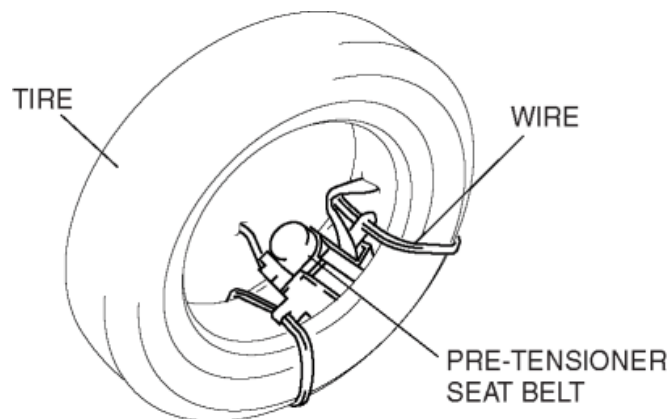
1. Remove the pre-tensioner seat belt.

(See [SEAT BELT REMOVAL/INSTALLATION](#).)

2. Connect the **SST** (Adapter harness) to the pre-tensioner seat belt as shown in the figure.



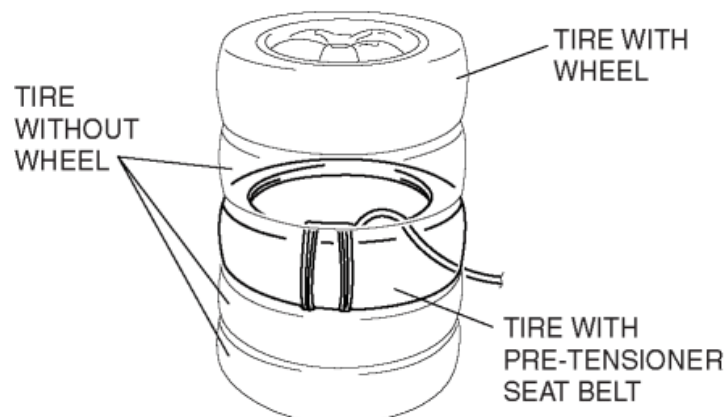
3. Put the pre-tensioner seat belt inside the tire and secure it to the tire by wrapping a wire (cross section of **1.25mm<sup>2</sup>** {**0.002in<sup>2</sup>**} or more) through the tire and the bolt installation holes **at least 4 times**.



### WARNING:

- If the pre-tensioner seat belt is not properly installed to the tire, serious injury may occur when the pre-tensioner part is operated (deployed). When installing the pre-tensioner seat belt to the tire, make sure the pre-tensioner part is inside the tire.

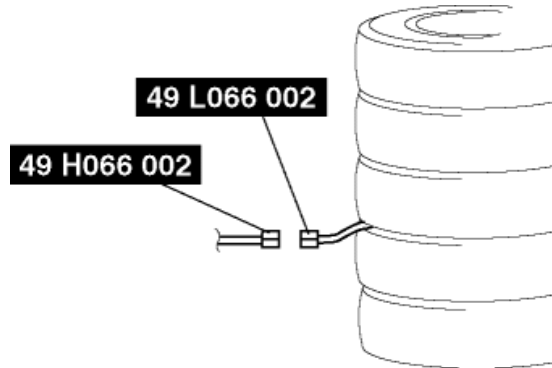
4. Stack the tire with the pre-tensioner seat belt on top of two tires without wheels. Stack a tire without a wheel on top of the tire with the pre-tensioner seat belt, and then stack another tire with a wheel on the very top.



5. Secure the tires with wire.



6. Connect the **SST** (Deployment tool) to the **SST** (Adapter harness).

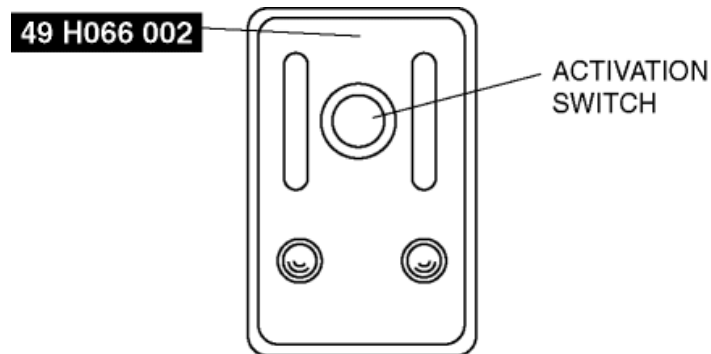


7. Connect the **SST** (Deployment tool) to the battery. Connect the power supply red clip to the positive battery terminal, and the black clip to the negative battery terminal.

8. Verify that the red lamp on the **SST** (Deployment tool) is illuminated.

9. Verify that all persons are standing **at least 6 m {20 ft}** away from the vehicle.

10. Press the activation switch on the **SST** (Deployment tool) to operate (deploy) the pre-tensioner seat belt.



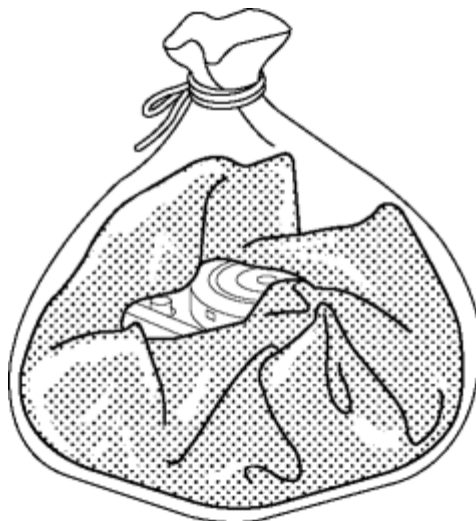
11. Disconnect the **SSTs** (Deployment tool) from the **SSTs** (Adapter harness).

## 2008 - MX-5 - Restraints

### AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DISPOSAL PROCEDURES

#### WARNING:

- A live (undeployed) air bag module or pre-tensioner seat belt may accidentally operate (deploy) when it is disposed of and cause serious injury. Always refer to the "AIR BAG MODULE AND PRE-TENSIONER SEAT BELT DEPLOYMENT PROCEDURES" and dispose of air bag modules and pre-tensioner seat belts in a deployed condition.
  - The air bag modules and the pre-tensioner seat belts are very hot immediately after they are deployed. You can be burned. Do not touch an air bag module and pre-tensioner seat belt for at least 15 min after deployment.
  - Pouring water on the deployed air bag module and pre-tensioner seat belt is dangerous. The water will mix with the residual gases to form a gas that can make breathing difficult. Do not pour water on the deployed air bag module and pre-tensioner seat belt.
  - The deployed air bag module or pre-tensioner seat belt may contain deposits of sodium hydroxide, a caustic byproduct of the gas-generated combustion. If this substance gets into your eyes or on your hands, it can cause irritation and itching. When handling the deployed air bag module and pre-tensioner seat belt, wear gloves and safety glasses.
  - Due to the adoption of 2-step deployment control in both the driver and passenger-side air bag modules, depending on the impact force, it is possible that inflator No.2 might not operate (deploy). Before disposing of the air bag module, always follow the inflator deployment procedures and verify the complete operation (deployment) of inflators No.1 and 2.
1. Remove the deployed air bag module or pre-tensioner seat belt.
  2. Put the air bag module or pre-tensioner seat belt in a plastic bag, seal the bag, and then dispose of it.







## 2008 - MX-5 - Restraints

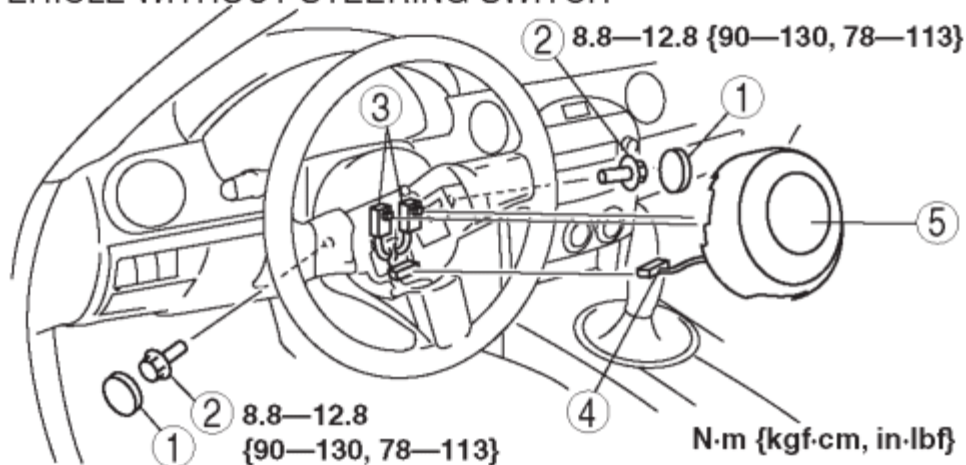
### DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION

#### WARNING:

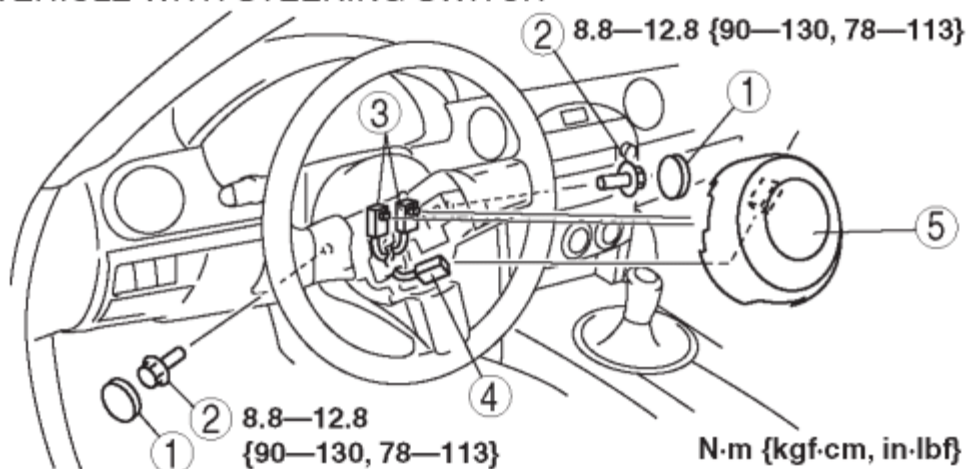
- Handling the air bag module improperly can accidentally deploy the air bag module, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag module. (See [AIR BAG SYSTEM SERVICE WARNINGS](#).) (See [AIR BAG SYSTEM SERVICE CAUTIONS](#).)

1. Turn the ignition switch to the LOCK position.
2. Remove the battery cover.
3. Disconnect the negative battery cable and wait for **1 min or more**. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
4. Remove in the order indicated in the table.

#### VEHICLE WITHOUT STEERING SWITCH



#### VEHICLE WITH STEERING SWITCH

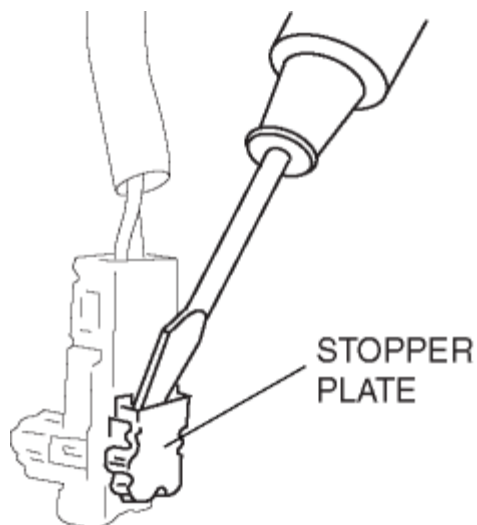


1	Cover
2	Bolt
3	Connector (air bag module) (See <a href="#">Connector Removal Note.</a> )
4	Connector (horn switch)
5	Driver-side air bag module

5. Install in the reverse order of removal.
6. Turn the ignition switch to the ON position.
7. Verify that the air bag system warning light illuminates for **approx. 6 s** and goes out.
  - If the air bag system warning light does not operate normally, refer to the on-board diagnostic system (air bag system) and perform inspection of the system.

### Connector Removal Note

1. Using a flathead screwdriver, pry out the connector stopper plate.



2. Disconnect the connector.

## 2008 - MX-5 - Restraints

### SAS CONTROL MODULE REMOVAL/INSTALLATION

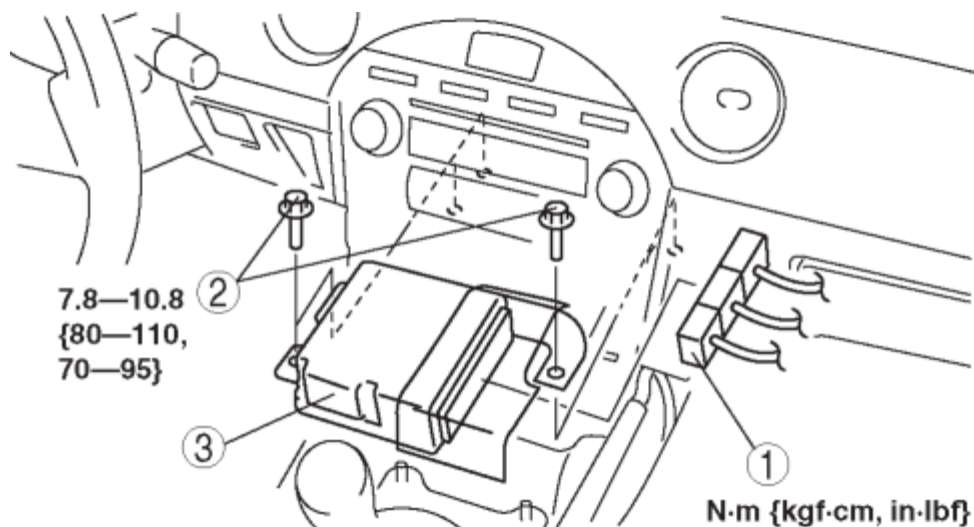
#### WARNING:

- Handling the SAS control module improperly can accidentally deploy the air bag modules and pre-tensioner seat belt, which may seriously injure you. Read the air bag system service warnings and cautions before handling the SAS control module. (See [AIR BAG SYSTEM SERVICE WARNINGS](#).) (See [AIR BAG SYSTEM SERVICE CAUTIONS](#).)

#### CAUTION:

- Handling the SAS control module improperly can accidentally deploy the air bag modules and pre-tensioner seat belt, which may seriously injure you. If configuration is not completed before removing the SAS control module, DTC B2477 will be displayed.

1. Perform SAS control module configuration when replacing it. (See [SAS CONTROL MODULE CONFIGURATIONS](#).)
2. Turn the ignition switch to the LOCK position.
3. Remove the battery cover.
4. Disconnect the negative battery cable and wait for **1 min or more**. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
5. Remove the following parts:
  - a. Console (See [CONSOLE REMOVAL/INSTALLATION](#).)
  - b. Side wall (See [SIDE WALL REMOVAL/INSTALLATION](#).)
  - c. Console panel (See [CONSOLE PANEL REMOVAL/INSTALLATION](#).)
  - d. Keyless antenna (interior, middle) (See [KEYLESS ANTENNA REMOVAL/INSTALLATION \[ADVANCED KEYLESS SYSTEM\]](#).)
6. Remove in the order indicated in the table.



1	Connector
2	Bolt
3	SAS control module

7. Install in the reverse order of removal.

8. Turn the ignition switch to the ON position.

- If the SAS control module is replaced, turn the ignition switch to the ON position for **20 s or more** after completing the configuration. (See [SAS CONTROL MODULE CONFIGURATION](#).)

9. Verify that the air bag system warning light illuminates for **approx. 6 s** and goes out.

- If the air bag system warning light does not operate normally, refer to the on-board diagnostic system (air bag system) and perform inspection of the system.

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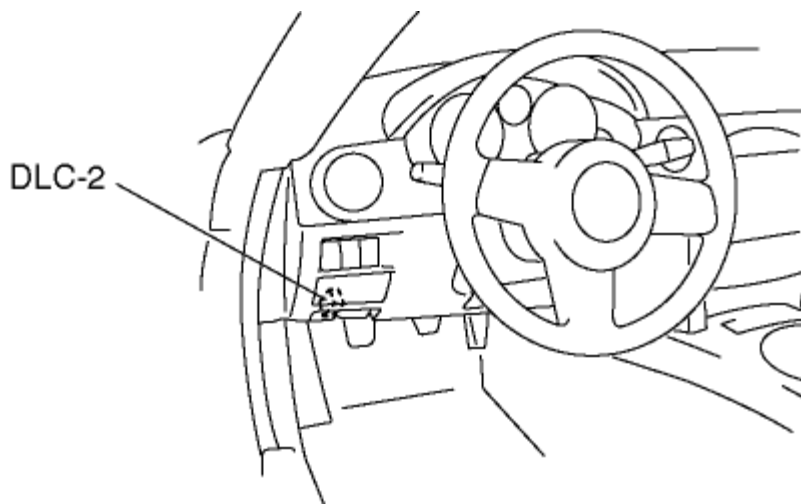
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## 2008 - MX-5 - Restraints

### SAS CONTROL MODULE CONFIGURATION

1. Connect the M-MDS to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.
  - When using the IDS (laptop PC)
    - Select "Module Programming".
  - When using the PDS (Pocket PC)
    - Select "Programming".
    - Select "Module Programming".
3. Then, select items from the screen menu in the following order.
  1. Select "Programmable Module Installation".
  2. Select "RCM".
4. Perform the configuration according to the directions on the screen.
5. Retrieve DTCs by the M-MDS, then verify that there is no DTC present.
  - If a DTC (s) is detected, perform the applicable DTC inspection. (See [DTC TABLE](#).)

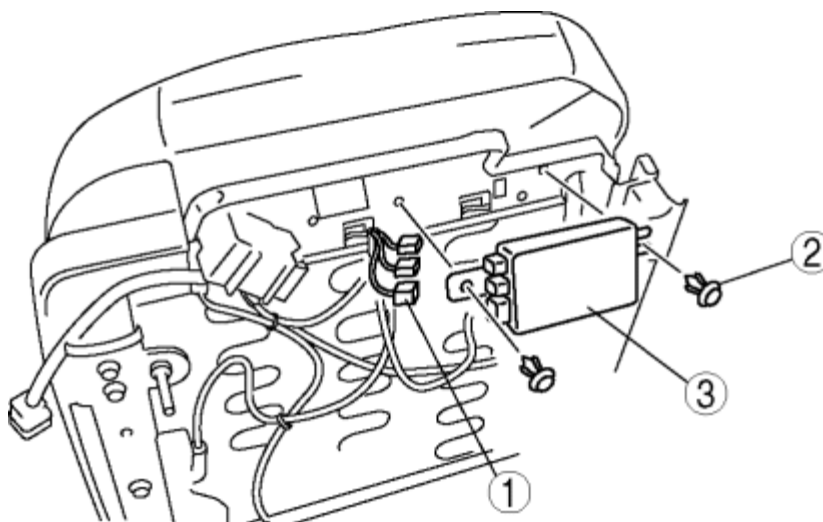
## 2008 - MX-5 - Restraints

### SEAT WEIGHT SENSOR CONTROL MODULE REMOVAL/INSTALLATION

#### CAUTION:

- When the seat weight sensor control module is replaced with a new one, perform the seat weight sensor calibration using the M-MDS. (See [SEAT WEIGHT SENSOR CALIBRATION](#).)

1. Turn the ignition switch to the LOCK position.
2. Remove the battery cover.
3. Disconnect the negative battery cable and wait for **1 min or more**. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
4. Remove in the order indicated in the table.



1	Connector
2	Fastener
3	Seat weight sensor control module

5. Install in the reverse order of removal.

## 2008 - MX-5 - Restraints

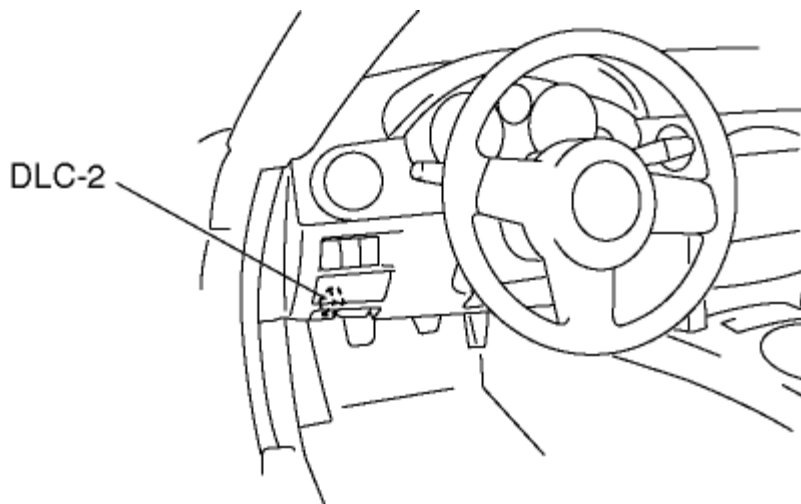
### SEAT WEIGHT SENSOR CALIBRATION

#### CAUTION:

- If any of the following work is performed, perform the seat weight sensor calibration using the M-MDS.
  - Replacement with a new seat weight sensor
  - Replacement with a new seat weight sensor control module
  - Replacement with new passenger-side seat parts
  - Disassembly of the passenger-side seat
- If any of the following work is performed, perform the seat weight sensor inspection using the M-MDS. (See [SEAT WEIGHT SENSOR INSPECTION](#).)
  - Removal of the passenger-side seat
  - Loosening and retightening of passenger's seat fixing bolts
  - Or, the vehicle is involved in a collision

1. Have two **20 kg {44 lb}** weights ready to use.

2. Connect the M-MDS to the DLC-2.



3. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  - Select "Body".
  - Select "Restraints".



When using the PDS (Pocket PC)

- Select "All Tests and Calibrations".

4. Then, select item from the screen menu in the following order.

- Select "Passenger Seat Weight Sensor ReZero".

5. Perform calibration following the procedures on the M-MDS screen.

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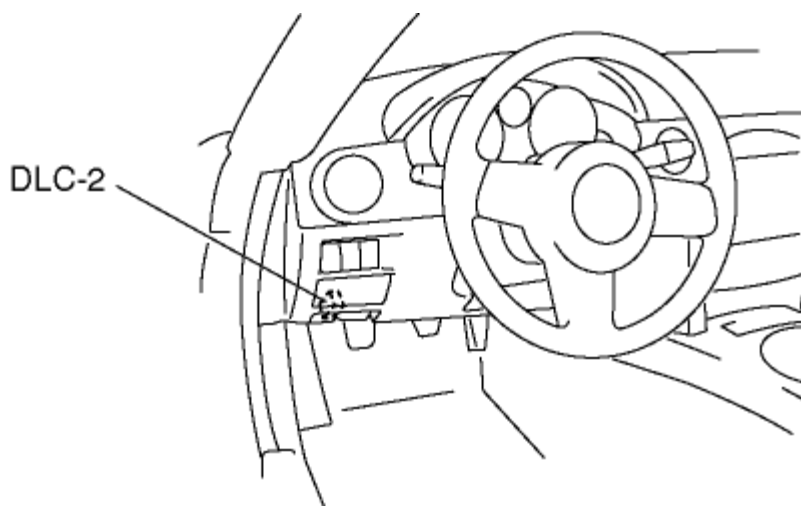
## 2008 - MX-5 - Restraints

### SEAT WEIGHT SENSOR INSPECTION

#### CAUTION:

- If any of the following work is performed, perform the seat weight sensor inspection using the M-MDS.
  - Removal of the passenger-side seat
  - Loosening and retightening of passenger's seat fixing bolts
  - Or, the vehicle is involved in a collision
- If any of the following work is performed, perform the seat weight sensor calibration using the M-MDS. (See [SEAT WEIGHT SENSOR CALIBRATION](#).)
  - Replacement with a new seat weight sensor
  - Replacement with a new seat weight sensor control module
  - Replacement with new passenger-side seat parts
  - Disassembly of the passenger-side seat

1. Connect the M-MDS to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  - Select "Body".
  - Select "Restraints".
- When using the PDS (Pocket PC)

Select "All Tests and Calibrations".

3. Then, select item from the screen menu in the following order.

- Select "Passenger Seat Weight Sensor ReZero".

4. Perform inspection following the procedures on the M-MDS screen.

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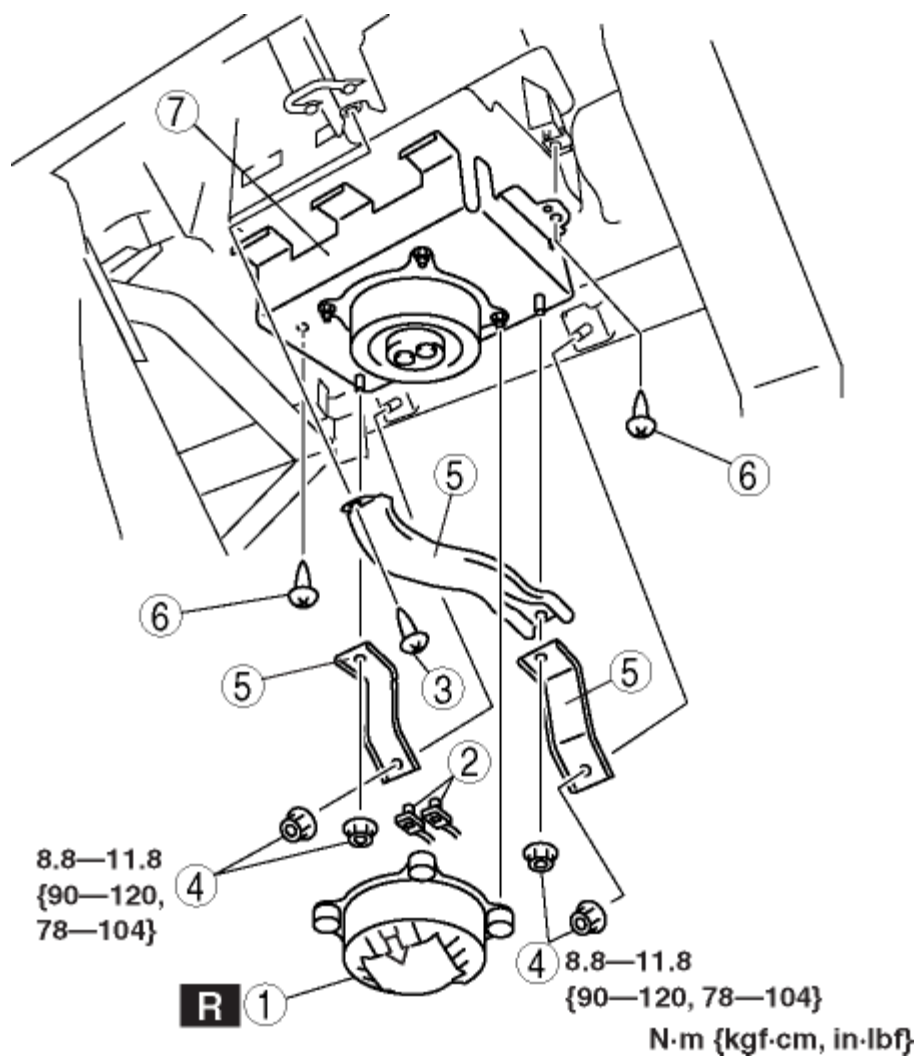
## 2008 - MX-5 - Restraints

### PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION

#### WARNING:

- Handling the air bag module improperly can accidentally deploy the air bag module, which may seriously injure you. Read the air bag system service warnings and cautions before handling the air bag module. (See [AIR BAG SYSTEM SERVICE WARNINGS](#).) (See [AIR BAG SYSTEM SERVICE CAUTIONS](#).)
- If the passenger-side air bag module is installed with debris in the module, it may be scattered when the air bag module operates (deploys), causing injury. Verify that there is no debris in the passenger-side air bag module before installation.
- If a damaged passenger-side air bag module is installed, the vehicle may be damaged or the passenger may be injured when the air bag module operates (deploys). Verify that the passenger-side air bag has no damage before installation.
- Due to the adoption of 2-step deployment control in the passenger-side air bag module, depending on the impact force, it is possible that inflator No.2 might not deploy. In such cases, before disposing of the air bag module, make sure to follow the inflator deployment procedures and verify complete deployment of inflators No.1 and 2.

1. Turn the ignition switch to the LOCK position.
2. Remove the battery cover.
3. Disconnect the negative battery cable and wait for **1 min or more**. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
4. Remove the glove compartment. (See [GLOVE COMPARTMENT REMOVAL/INSTALLATION](#).)
5. Remove in the order indicated in the table.



1 Cap

(See [Cap Installation Note.](#))

2 Connector

(See [Connector Removal Note.](#))

3 Screw A

4 Nut

5 Bracket

6 Screw B

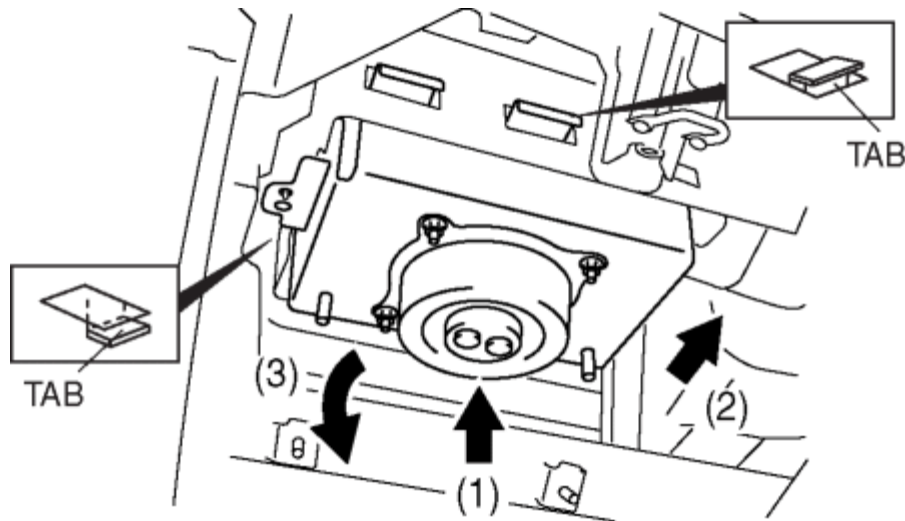
7 Passenger-side air bag module

(See [Passenger-side Air Bag Module Removal Note.](#))

6. Install in the reverse order of removal.
7. Turn the ignition switch to the ON position.
8. Verify that the air bag system warning light illuminates for **approx. 6 s** and goes out.
  - If the air bag system warning light does not operate, refer to the on-board diagnostic system (air bag system) and perform inspection of the system.

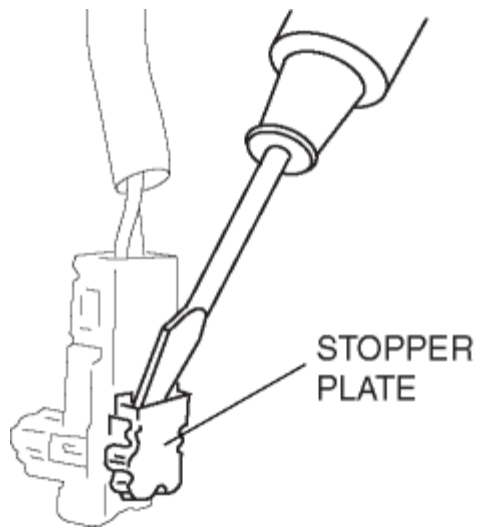
### Passenger-side Air Bag Module Removal Note

1. Remove the passenger-side air bag module in the order indicated below.
  - a. Disengage the tab locks by sliding the passenger-side air bag module upward.
  - b. Slide the passenger-side air bag module rearward.
  - c. Remove the passenger-side air bag module by pulling it from the backside and then down.



### Connector Removal Note

1. Using a flathead screwdriver, pry out the connector stopper plate.



2. Disconnect the connector.

### Cap Installation Note

1. The cap cannot be reused. Replace the cap with a new one when the cap or the passenger-side air bag module has been removed.

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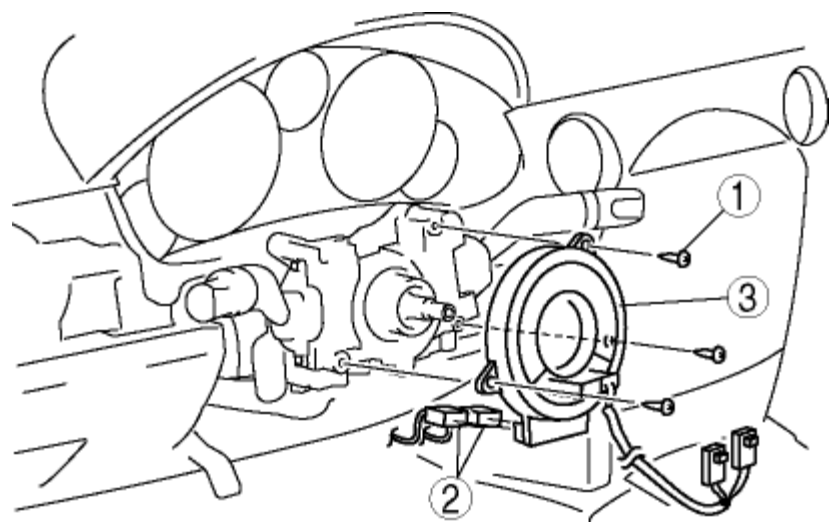
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2008 - MX-5 - Restraints

CLOCK SPRING REMOVAL/INSTALLATION

- 1. Remove the battery cover.
- 2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
- 3. Remove the following parts:
  - a. Driver-side air bag module (See [DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.](#))
  - b. Steering wheel (See [STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.](#))
  - c. Column cover (See [COLUMN COVER REMOVAL/INSTALLATION.](#))
- 4. Remove in the order indicated in the table.



1	Screw
2	Connector
3	Clock spring (See <a href="#">Clock Spring Installation Note.</a> )

- 5. Install in the reverse order of removal.
- 6. Turn the ignition switch to the ON position.
- 7. Verify that the air bag system warning light illuminates for **approx. 6 s** and goes out.



- If the air bag system warning light does not operate normally, refer to the on-board diagnostic system (air bag system) and perform inspection of the system.

## **Clock Spring Installation Note**

### **CAUTION:**

- If the clock spring is not adjusted, the spring wire in the clock spring could over-wind and break when the steering wheel is turned. Always adjust the clock spring after installing it.
1. Adjust the clock spring after installing it. (See [CLOCK SPRING ADJUSTMENT](#).)

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## 2008 - MX-5 - Restraints

### CLOCK SPRING ADJUSTMENT

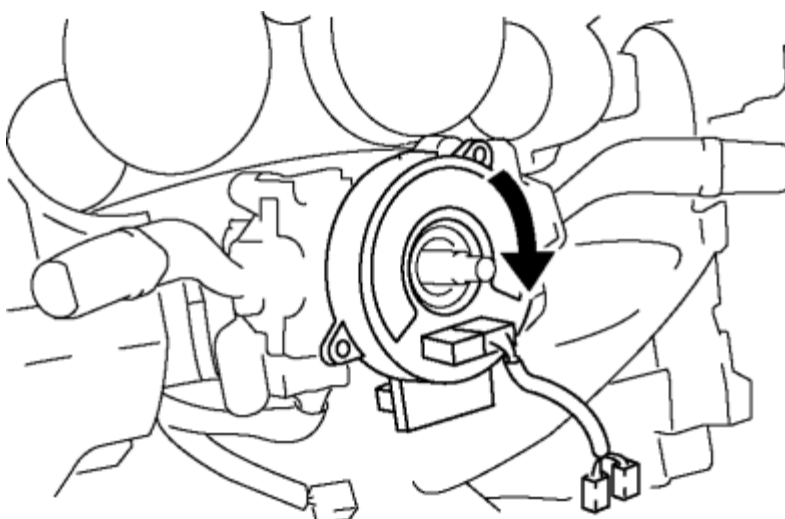
#### NOTE:

- The adjustment procedure is also specified on the caution label of the clock spring.

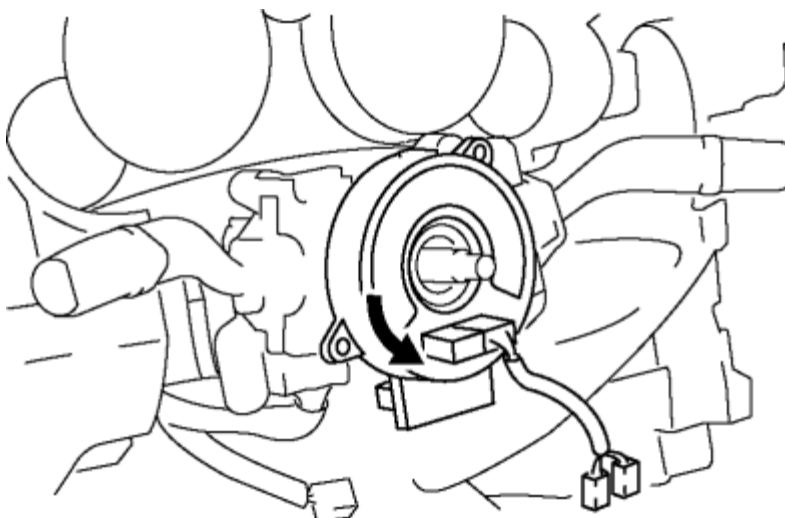
1. Set the front tires straight-ahead.

#### CAUTION:

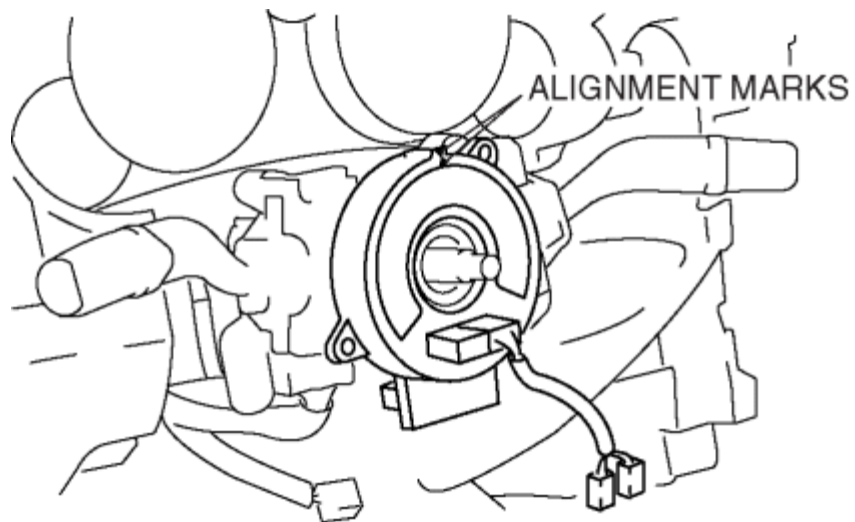
- The clock spring will break if over-wound. Do not forcibly turn the clock spring.
2. Turn the clock spring clockwise until it stops.



3. From the stopped position, turn the clock spring counterclockwise **2 3/4 turns**.



4. Align the mark on the clock spring with the mark on the outer housing.



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2008 - MX-5 - Restraints

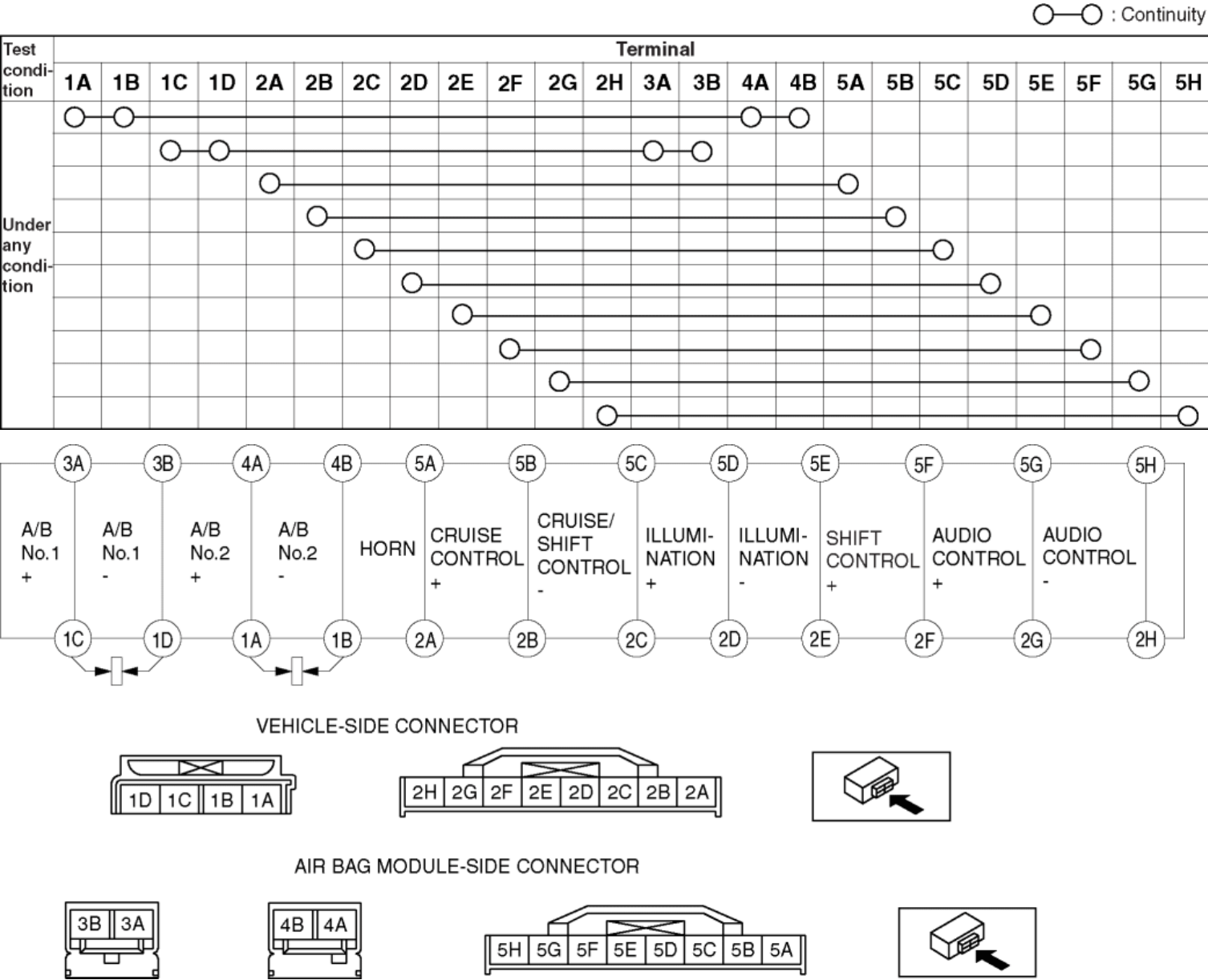
CLOCK SPRING INSPECTION

1. Remove the driver-side air bag module. (See DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.)
2. Remove the steering wheel. (See STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.)
3. Remove the clock spring. (See CLOCK SPRING REMOVAL/INSTALLATION.)
4. Verify that the continuity is as indicated in the table.

• If not as indicated in the table, replace the clock spring.

NOTE:

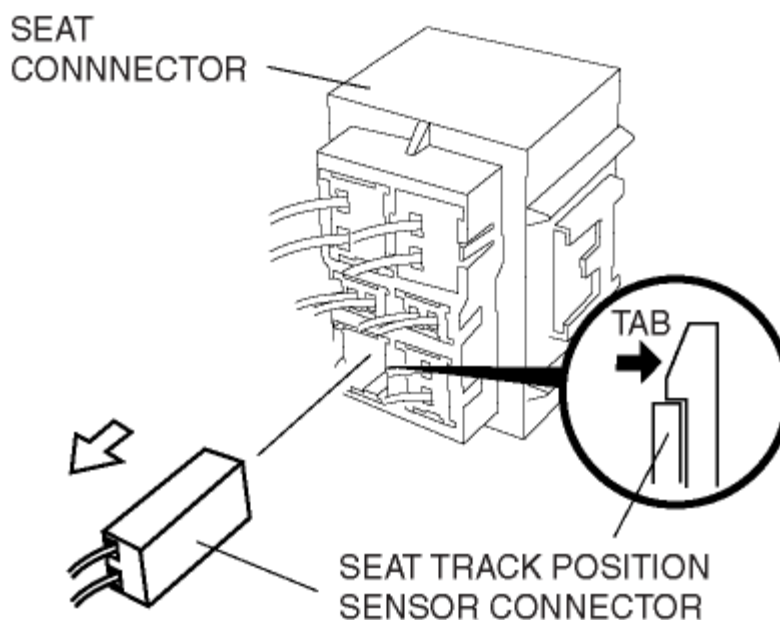
- When the vehicle-side connector for the clock spring is disconnected, terminals 1A, 1B, 1C and 1D are shorted to prevent unexpected operation (deployment) of the air bag module.



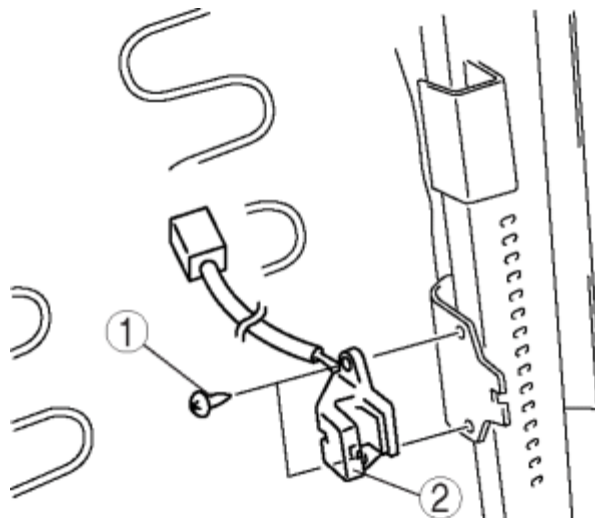
## 2008 - MX-5 - Restraints

### SEAT TRACK POSITION SENSOR REMOVAL/INSTALLATION

1. Turn the ignition switch to the LOCK position.
2. Remove the battery cover.
3. Disconnect the negative battery cable and wait for **1 min or more**. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
4. Remove the driver's seat. (See [SEAT REMOVAL/INSTALLATION](#).)
5. Detach the tab as shown in the figure and remove the connector from the seat connector.



6. Remove in the order indicated in the table.

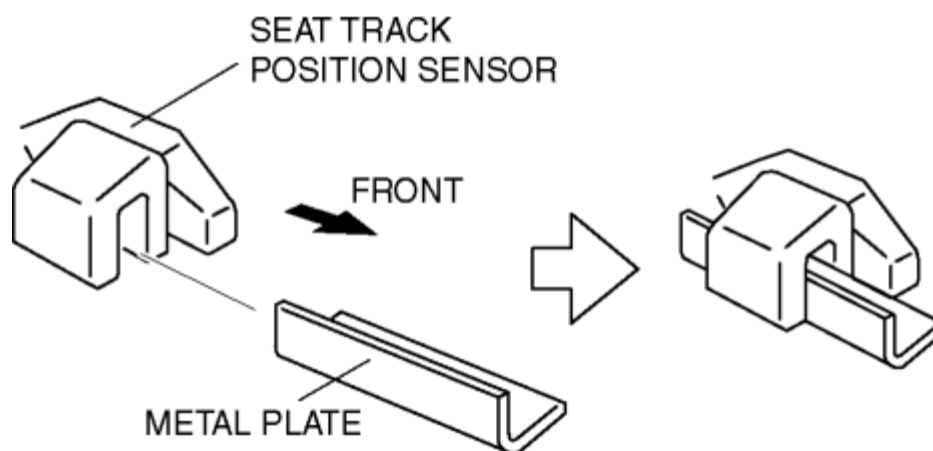


1	Screw
2	Seat track position sensor (See <a href="#">Seat Track Position Sensor Installation Note.</a> )

7. Install in the reverse order of removal.

### Seat Track Position Sensor Installation Note

- Verify that the seat track position sensor is not contacting the metal plate.



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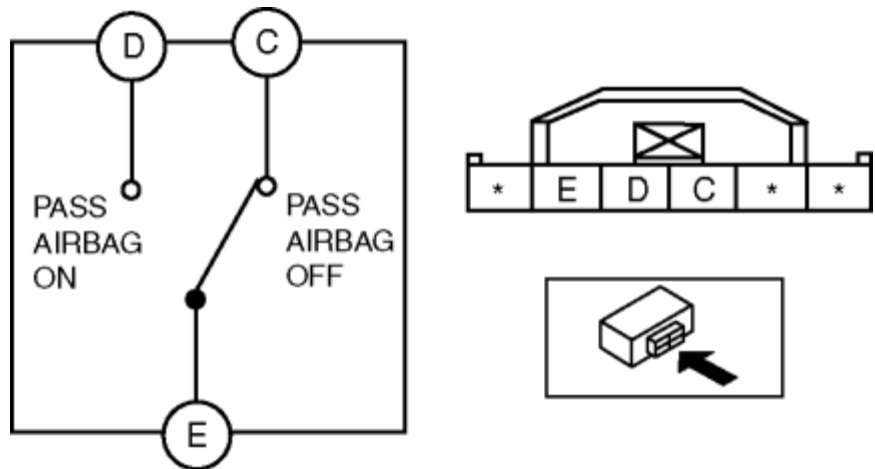
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2008 - MX-5 - Restraints

PASSENGER AIR BAG DEACTIVATION (PAD) SWITCH INSPECTION

- 1. Remove the PAD switch. (See PASSENGER AIR BAG DEACTIVATION (PAD) SWITCH REMOVAL/INSTALLATION.)
- 2. Verify that the continuity between the PAD switch terminals is as indicated in the table.



- If not as indicated in the table, replace the PAD switch.

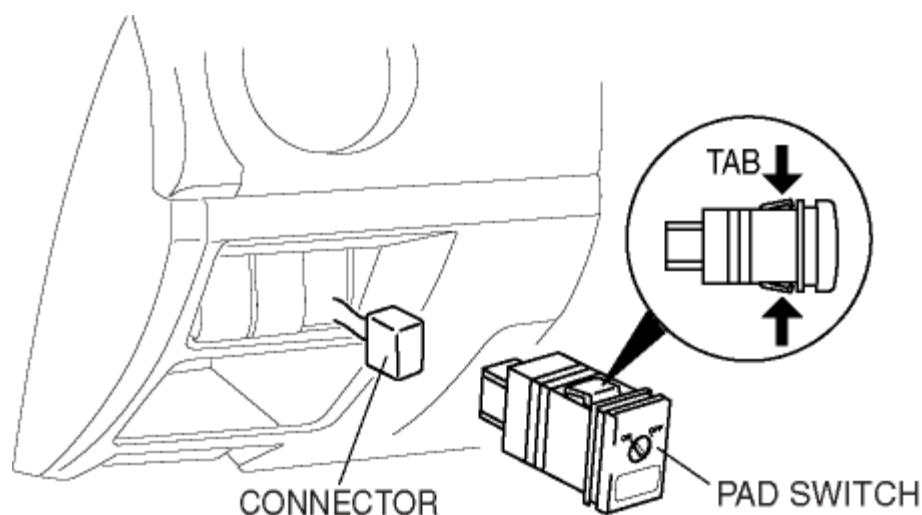
○ — ○ : Continuity

Switch position	Terminal		
	C	D	E
PASS AIRBAG OFF	○ —	— ○	○
PASS AIRBAG ON		○ —	○

## 2008 - MX-5 - Restraints

### PASSENGER AIR BAG DEACTIVATION (PAD) SWITCH REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the side panel. (See [SIDE PANEL REMOVAL/INSTALLATION.](#))
4. Disconnect the connector.
5. Remove the PAD switch.



6. Install in the reverse order of removal.
7. Turn the ignition switch to the ON position.
8. Verify that the air bag system warning light illuminates for **approx. 6 s** and goes out.
  - If the air bag system warning light does not operate normally, refer to the on-board diagnostic system (air bag system) and perform inspection of the system.



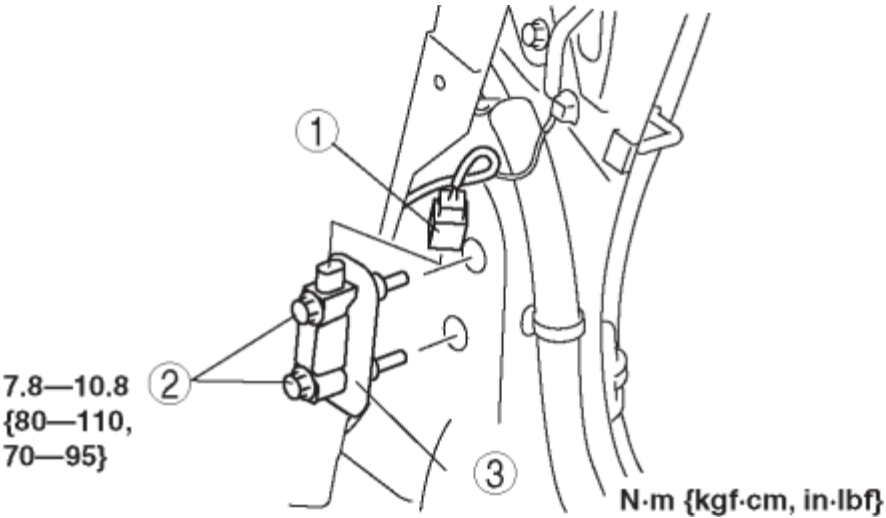
## 2008 - MX-5 - Restraints

### SIDE AIR BAG SENSOR REMOVAL/INSTALLATION

**WARNING:**

- Handling the side air bag sensor improperly can accidentally operate (deploy) the air bag module, which may seriously injure you. Read the air bag system service warnings and cautions before handling the side air bag sensor. (See [AIR BAG SYSTEM SERVICE WARNINGS](#).) (See [AIR BAG SYSTEM SERVICE CAUTIONS](#).)

1. Turn the ignition switch to the LOCK position.
2. Remove the battery cover.
3. Disconnect the negative battery cable and wait for **1 min or more**. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
4. Remove the quarter trim. (See [QUARTER TRIM REMOVAL/INSTALLATION](#).)
5. Remove the scuff plate. (See [SCUFF PLATE REMOVAL/INSTALLATION](#).)
6. Remove the tire house trim. (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION](#).)
7. Remove in the order indicated in the table.



1	Connector
2	Bolt
3	Side air bag sensor

8. Install in the reverse order of removal.
9. Turn the ignition switch to the ON position and hold for **5 s or more**.
10. Verify that the air bag system warning light illuminates for **approx. 6 s** and goes out.
  - If the air bag system warning light does not operate normally, refer to the on-board diagnostic system (air bag system) and perform inspection of the system.

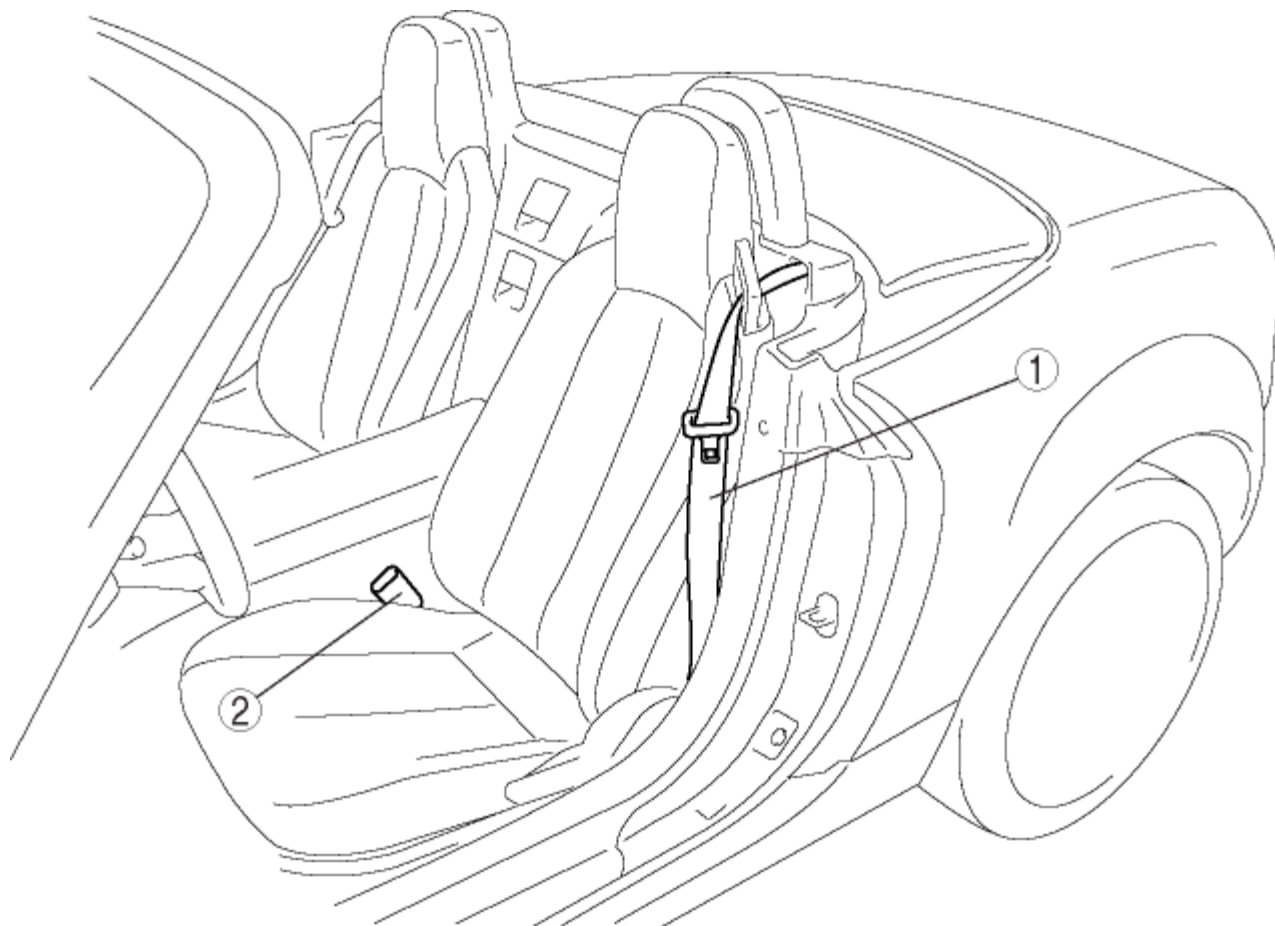
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## 2008 - MX-5 - Restraints

### LOCATION INDEX



1 Seat belt

(See [SEAT BELT REMOVAL/INSTALLATION.](#))

(See [SEAT BELT INSPECTION.](#))

2 Buckle

(See [BUCKLE REMOVAL/INSTALLATION.](#))

## 2008 - MX-5 - Restraints

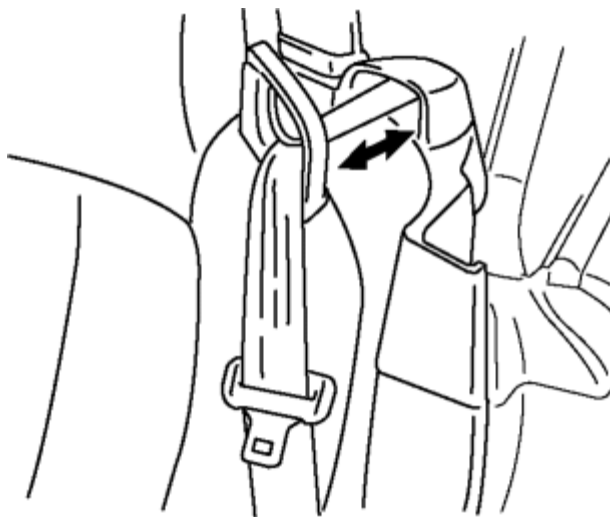
### SEAT BELT INSPECTION

#### Belt

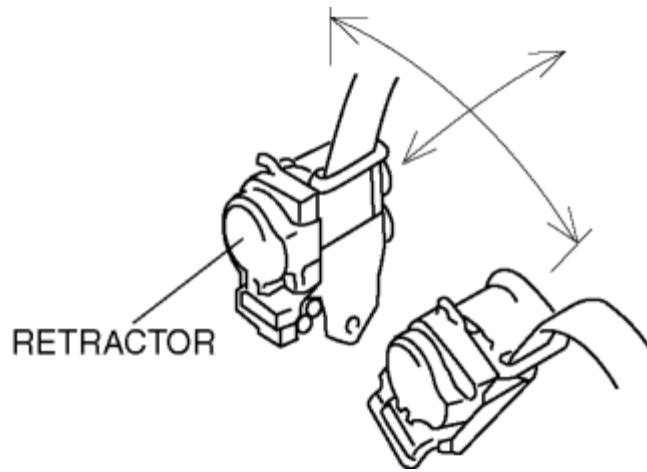
1. Verify that the belt is installed properly with no twists or kinks.
2. Verify that there is no damage to the seat belt and no deformation of the metal fittings.
  - If there is any malfunction, replace the seat belt.

#### ELR

1. Verify that the belt can be pulled out smoothly, and that it retracts smoothly.



- If there is any malfunction, replace the seat belt.
2. Verify that the retractor locks when the belt is pulled quickly.
    - If there is any malfunction, replace the seat belt.
  3. Remove the retractor.
  4. While pulling the seat belt out, make sure that the seat belt does not lock when the retractor is tilted slowly **up to 15°** from the mounted position and locks when the retractor is tilted **40° or more**.



- If there is any malfunction, replace the seat belt.

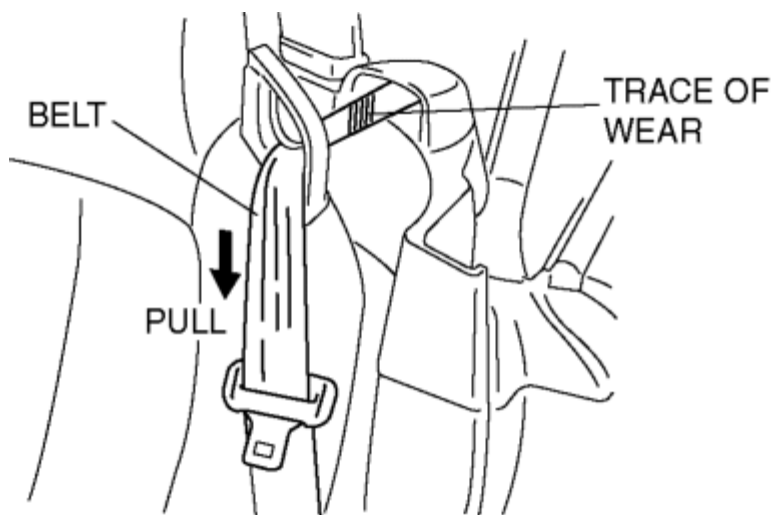
## ALR

1. Pull the belt out fully to change the lock mode from ELR to ALR.
2. Verify that retractor makes a clicking sound as the belt slowly retracts. If no sound is heard, the lock mode has not changed to ALR. If necessary, repeat Step 1.
  - If there is any malfunction, replace the seat belt.
3. Verify that the retractor locks when pulled.
  - If there is any malfunction, replace the seat belt.
4. Verify that the lock mode changes to ELR when the belt is fully pulled out.
  - If there is any malfunction, replace the seat belt.

## Load Limiter Retractor

### WARNING:

- When the load limiter operates, the belt and anchor rub against each other strongly leaving wear tracks. If the seat belt is used in this state, the seat belt will not function at its full capability and there is the possibility of serious injury to passengers. Be sure to replace the seat belt once the load limiter operates.
1. If the vehicle has been subjected to a shock in an accident, pull the belt from the retractor and confirm that there are no wear tracks (the load limiter has not operated) by visually inspecting and feeling the belt.



- If there is any malfunction, replace the seat belt.

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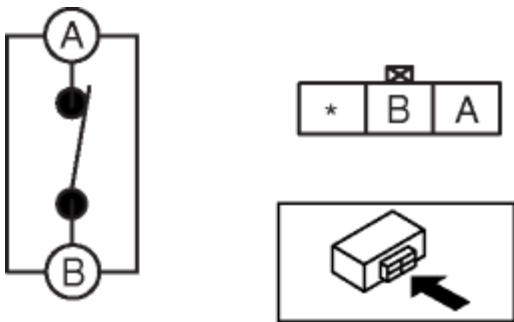
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2008 - MX-5 - Restraints

BUCKLE SWITCH INSPECTION

- 1. Remove the battery cover.
- 2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
- 3. Disconnect the buckle switch connector.
- 4. Inspect for continuity between the buckle switch terminals using a tester.



- If not as indicated in the table, replace the buckle.

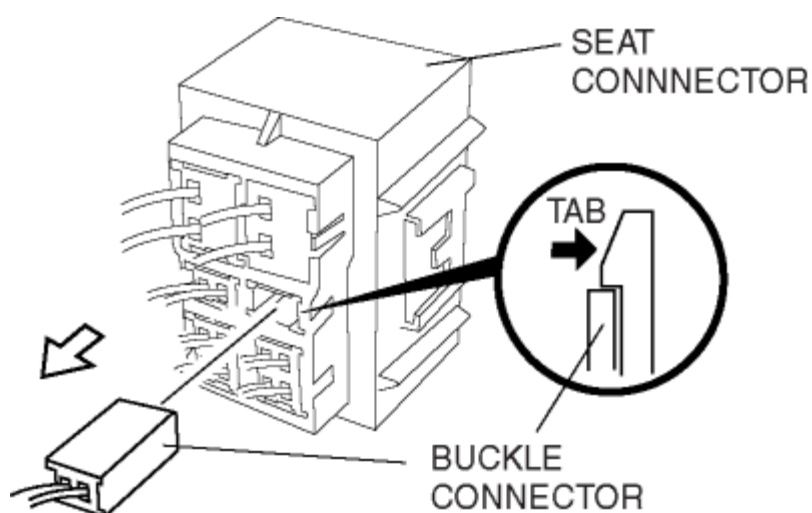
○ — ○ : Continuity

Seat belt	Terminal	
	A	B
Fastened		
Unfastened	○ —	— ○

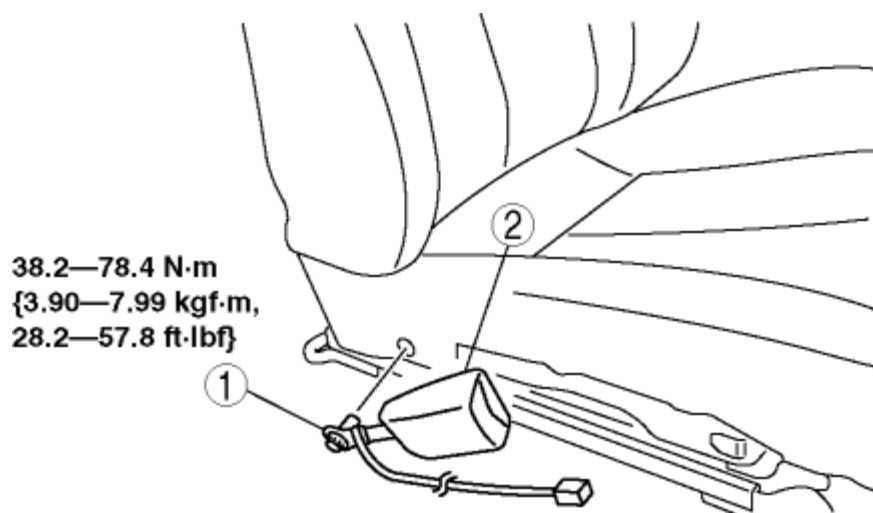
## 2008 - MX-5 - Restraints

### BUCKLE REMOVAL/INSTALLATION

1. Turn the ignition switch to the LOCK position.
2. Remove the battery cover.
3. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
4. Remove the seat. (See [SEAT REMOVAL/INSTALLATION](#).)
5. Detach the tab as shown in the figure and remove the connector from the seat connector.



6. Remove in the order indicated in the table.



1 Bolt



2	Buckle
---	--------

7. Install in the reverse order of removal.

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## 2008 - MX-5 - Restraints

### SEAT BELT REMOVAL/INSTALLATION

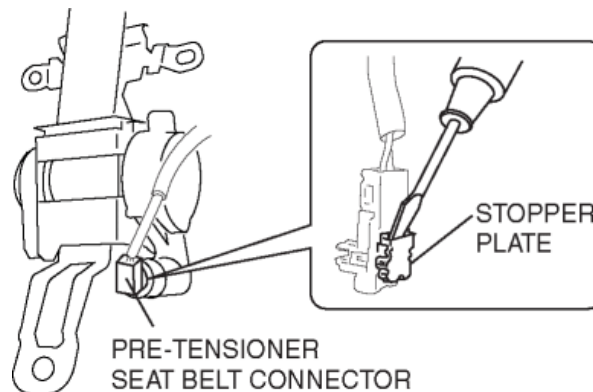
#### WARNING:

- Handling the seat belt (pre-tensioner seat belt) improperly can accidentally deploy the pre-tensioner seat belt, which may seriously injure you. Read the air bag system service warnings and cautions before handling the seat belt. (See [AIR BAG SYSTEM SERVICE WARNINGS](#).) (See [AIR BAG SYSTEM SERVICE CAUTIONS](#).)

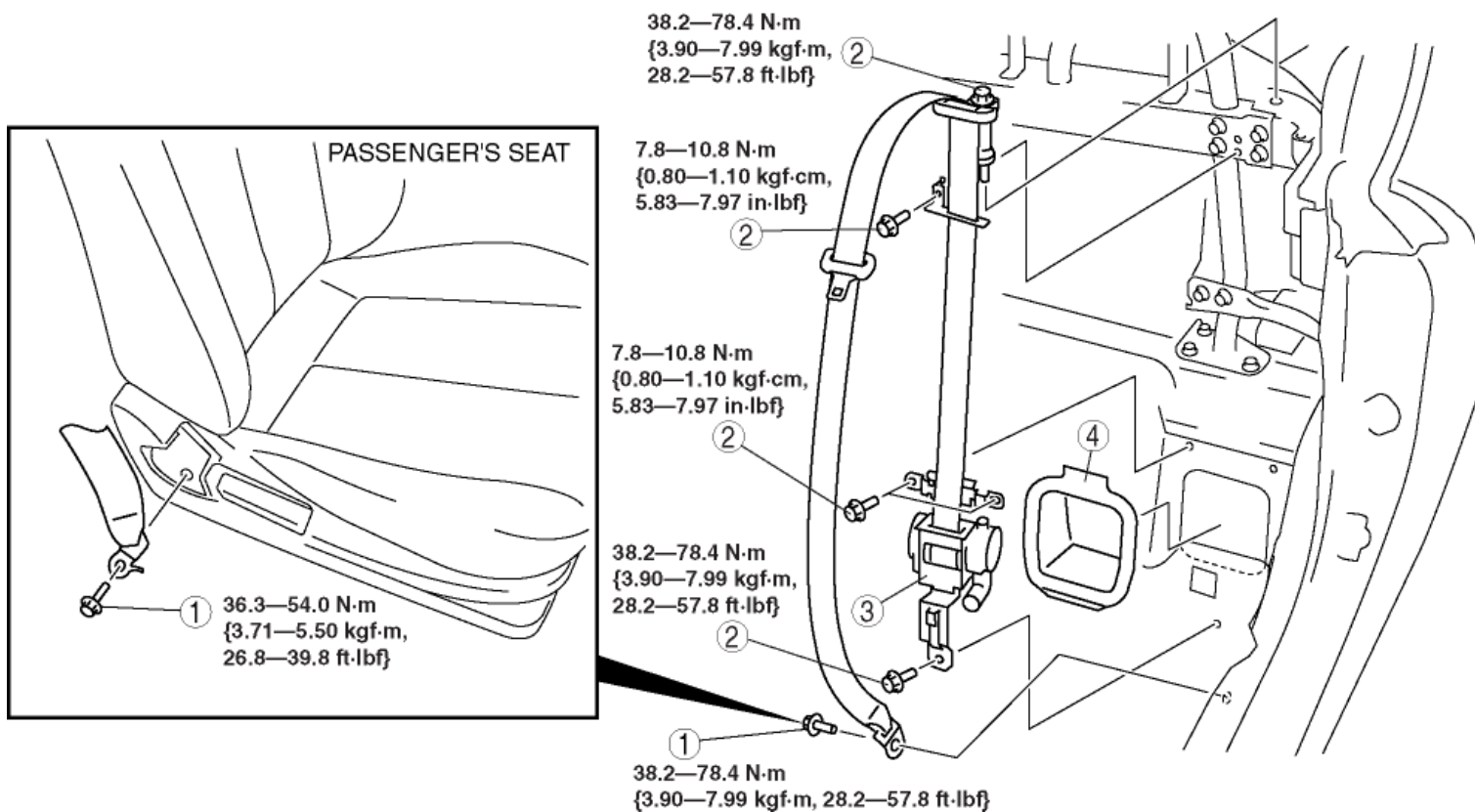
#### CAUTION:

- The ELR (emergency locking retractor) has a spring that will unwind if the retractor cover is removed. The spring cannot be rewound by hand. If this occurs, the ELR will not work properly. Therefore, do not disassemble the retractor.

- Turn the ignition switch to the LOCK position.
- Remove the battery cover.
- Disconnect the negative battery cable and wait for **1 min or more**. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
- Remove the following parts:
  - Console (See [CONSOLE REMOVAL/INSTALLATION](#).)
  - Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION](#).)
  - Scuff plate (See [SCUFF PLATE REMOVAL/INSTALLATION](#).)
  - Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION](#).)
  - Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION](#).)
  - Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION](#).)
  - Back trim (See [BACK TRIM REMOVAL/INSTALLATION](#).)
  - Anchor cover (passenger's seat) (See [SEAT REMOVAL/INSTALLATION](#).)
- Using a screwdriver, pry out the pre-tensioner seat belt connector stopper plate.



- Disconnect the pre-tensioner seat belt connector.
- Remove in the order indicated in the table.



1 Bolt A
2 Bolt B
3 Seat belt
4 Retractor screen

8. Install in the reverse order of removal.

9. Turn the ignition switch to the ON position.

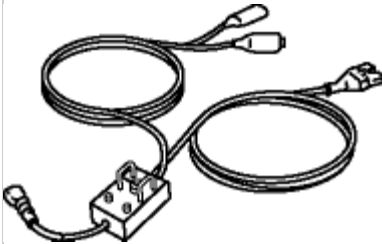
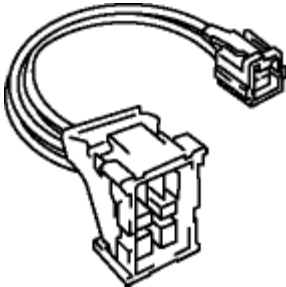


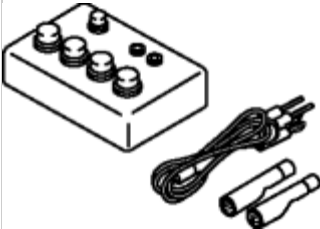
10. Verify that the air bag system warning light illuminates for **approx. 6 s** and goes out.

- If the air bag system warning light dose not operate, refer to the on-board diagnostic system (air bag system) and perform inspection of the system.

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2008 - MX-5 - Restraints

RESTRAINTS SST

49 H066 002 Deployment tool		49 B066 004 Adapter harness		49 L066 002 Adapter harness	
49 G066 003 Adapter harness		49 N088 0A0 Fuel and Thermometer checker		—	

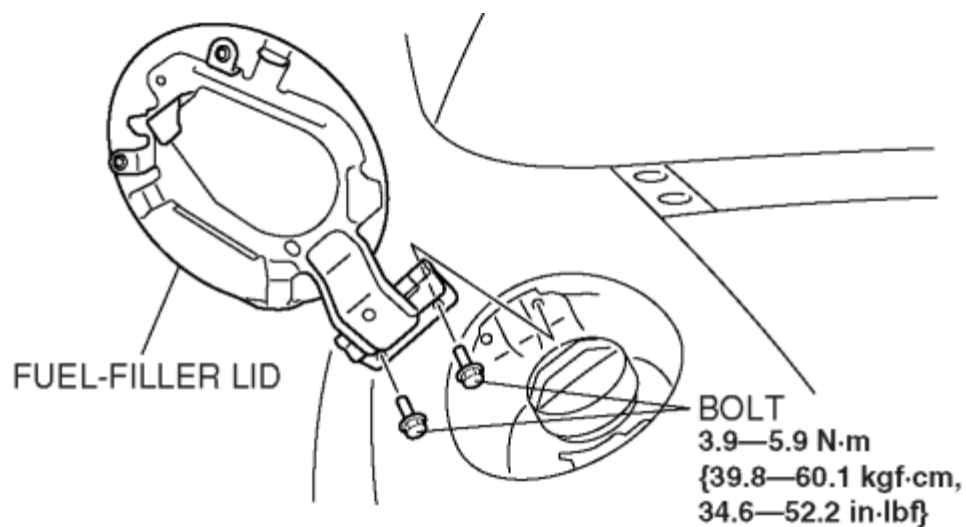
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## 2008 - MX-5 - Body and Accessories

### FUEL-FILLER LID REMOVAL/INSTALLATION

1. Remove the bolts.

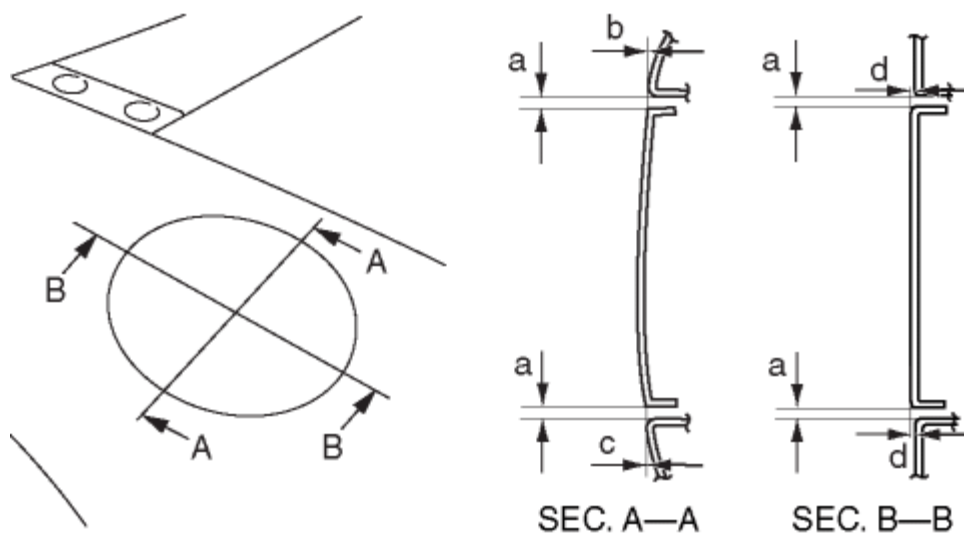


2. Remove the fuel-filler lid.
3. Install in the reverse order of removal.
4. Adjust the fuel-filler lid. (See [FUEL-FILLER LID ADJUSTMENT](#).)

## 2008 - MX-5 - Body and Accessories

### FUEL-FILLER LID ADJUSTMENT

1. Measure the gap and height difference between the fuel-filler lid and the body.
2. Loosen the fuel-filler lid installation bolts, and adjust the fuel-filler lid.



#### Standard clearance

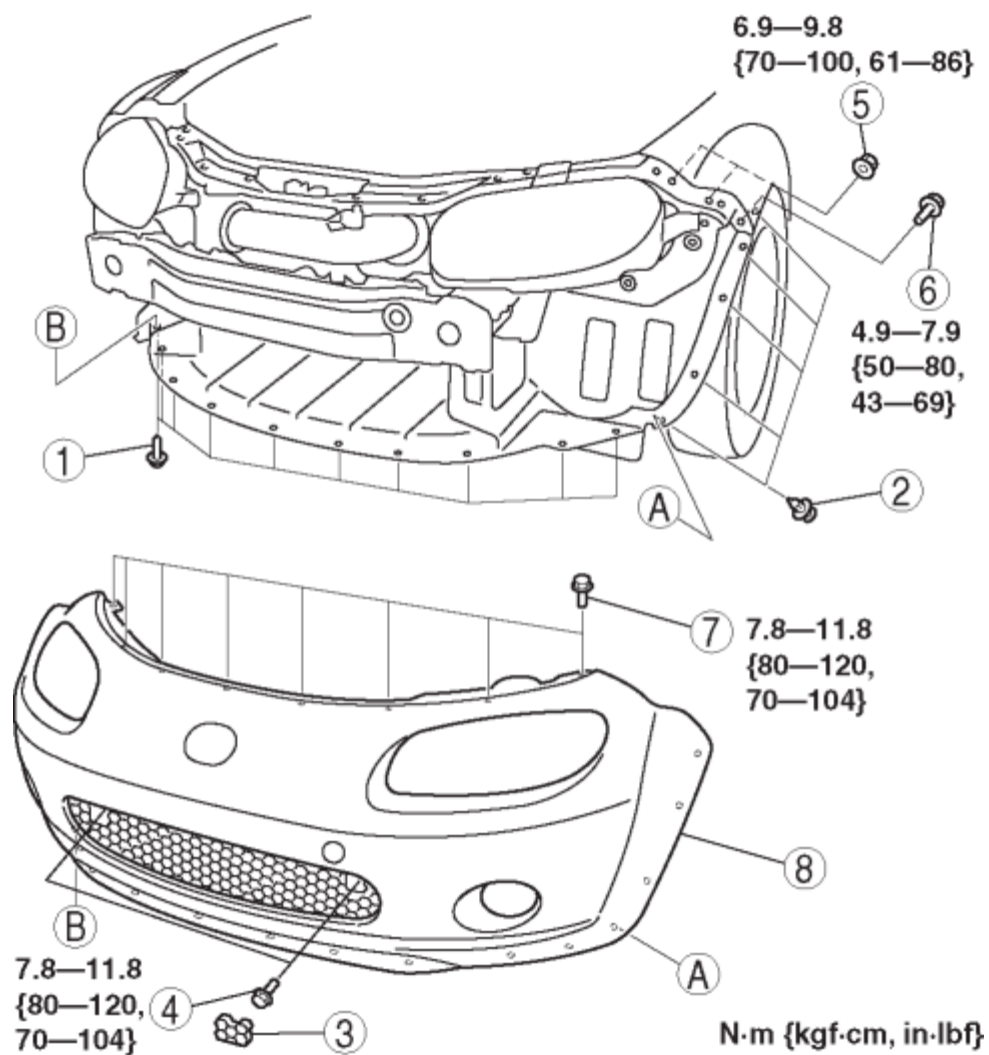
- a: 1.7—3.7 mm {0.07—0.14 in}
- b: -0.5—1.5 mm {-0.02—0.05 in}
- c: -1.0—1.0 mm {-0.04—0.03 in}
- d: -0.75—1.25 mm {-0.03—0.04 in}

3. Tighten the bolts.

2008 - MX-5 - Body and Accessories

FRONT BUMPER REMOVAL/INSTALLATION

- 1. Disconnect the negative battery cable. (SeeBATTERY REMOVAL/INSTALLATION [LF].)
- 2. Disconnect the front fog light connectors for vehicles with front fog lights.
- 3. Disconnect the side marker light connectors.
- 4. Remove in the order indicated in the table.



1	Screw A
2	Fastener A

3	Cover
4	Bolt A
5	Nut
6	Bolt B
7	Bolt C
8	Front bumper

5. Install in the reverse order of removal.

6. Adjust the front fog light aiming for vehicles with the front fog lights. (See **FRONT FOG LIGHT AIMING**.)

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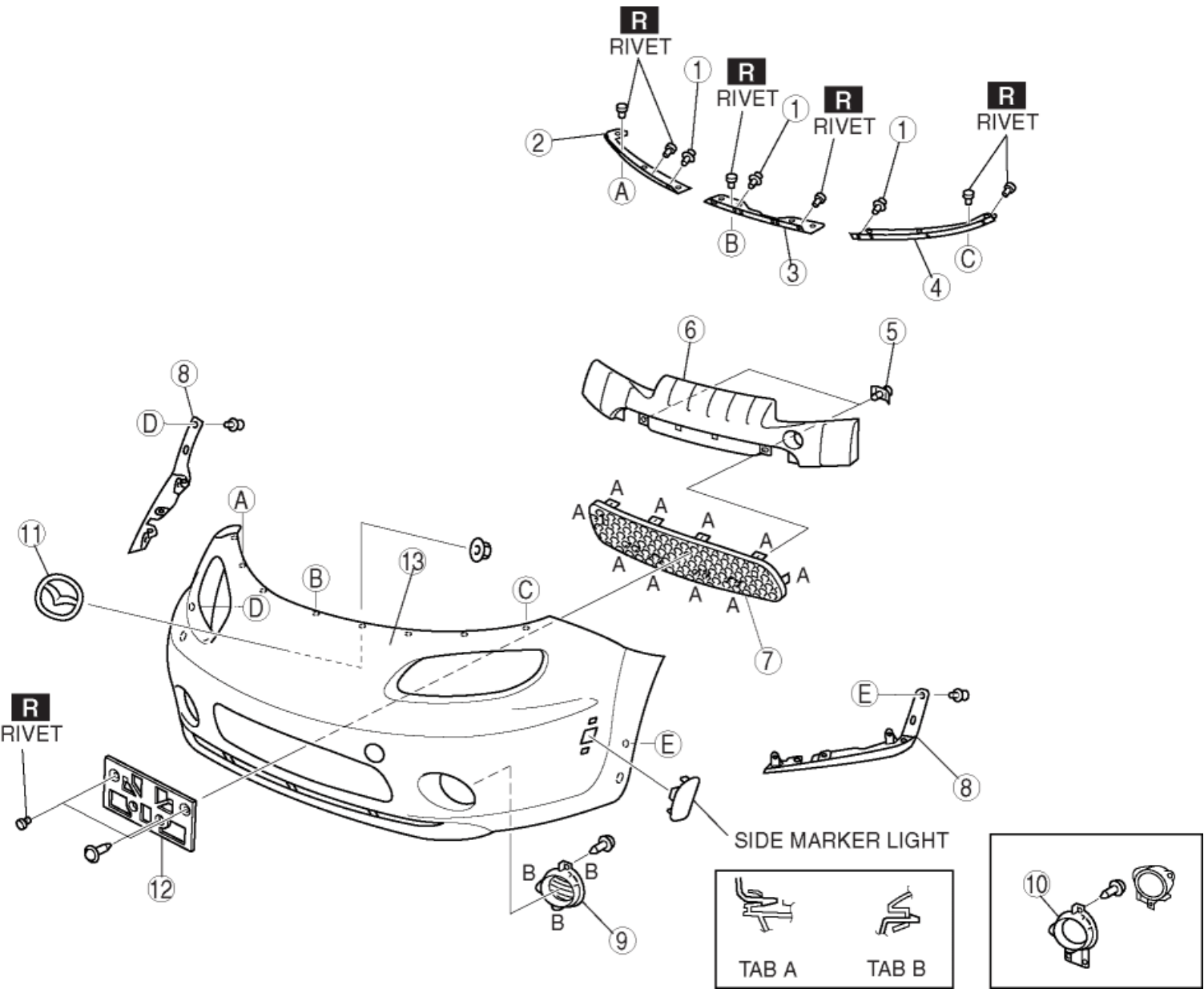


2008 - MX-5 - Body and Accessories

FRONT BUMPER DISASSEMBLY/ASSEMBLY

1. To disassemble the front bumper, remove the following parts:
- a. Front fog lights (Vehicles with the front fog lights) (See [FRONT FOG LIGHT REMOVAL/INSTALLATION.](#))

b. Front side marker light. (See [FRONT SIDE MARKER LIGHT REMOVAL/INSTALLATION.](#))
2. Disassemble in the order indicated in the table.



1	Fastener
2	Set plate RH

3	Set plate CTR
4	Set plate LH
5	Clip
6	Energy absorbing form
7	Front bumper mesh
8	Air dam skirt
9	Lamp hole cover (Vehicles without the front fog lights)
10	Lamp hole cover (Vehicles with the front fog lights)
11	Ornament
12	License plate holder
13	Front bumper fascia

3. Assemble in the reverse order of disassembly.

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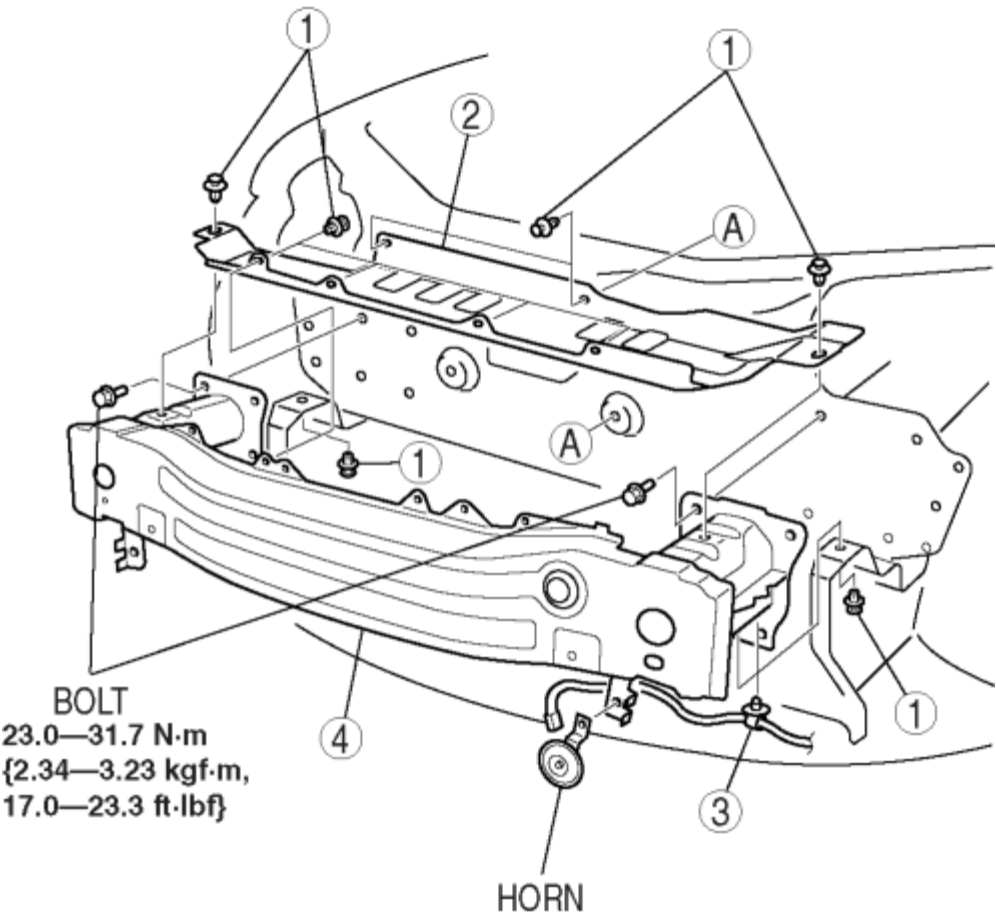
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2008 - MX-5 - Body and Accessories

FRONT BUMPER REINFORCEMENT REMOVAL/INSTALLATION

- 1. Disconnect the negative battery cable. (SeeBATTERY REMOVAL/INSTALLATION [LF].)
- 2. Remove the front bumper. (See FRONT BUMPER REMOVAL/INSTALLATION.)
- 3. Remove the front combination light. (See FRONT COMBINATION LIGHT REMOVAL/INSTALLATION.)
- 4. Remove the fresh air duct. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [LF].)
- 5. Remove the horn. (See HORN REMOVAL/INSTALLATION.)
- 6. Remove in the order indicated in the table.



BOLT  
23.0—31.7 N·m  
{2.34—3.23 kgf·m,  
17.0—23.3 ft·lb}

1	Clip
2	Shroud seal plate

3	Harness clip
4	Front bumper reinforcement

7. Install in the reverse order of removal.

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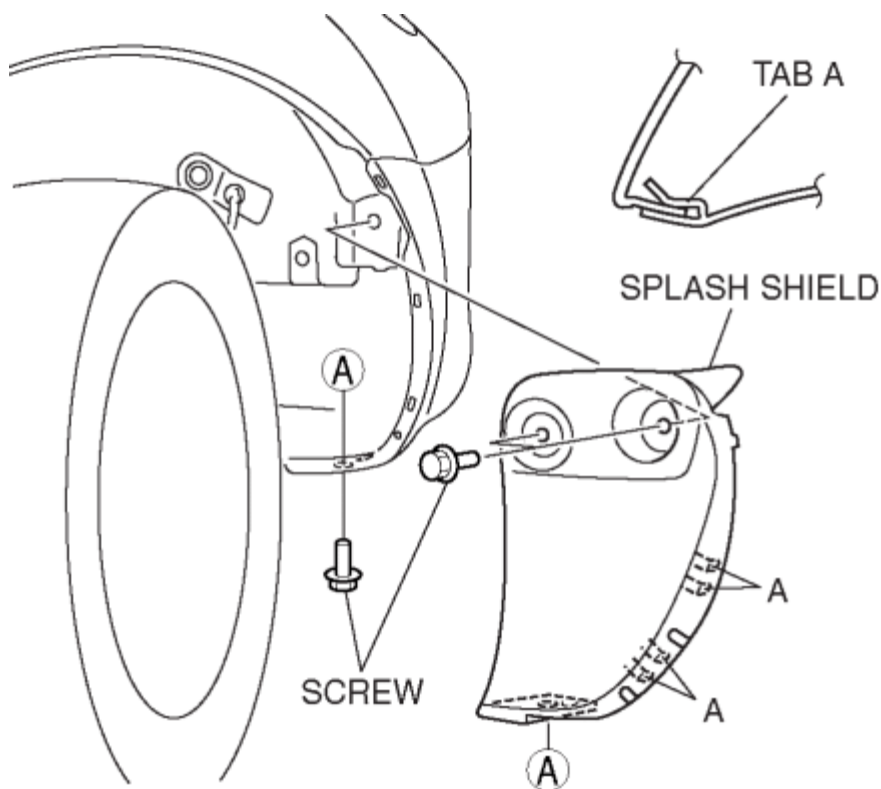
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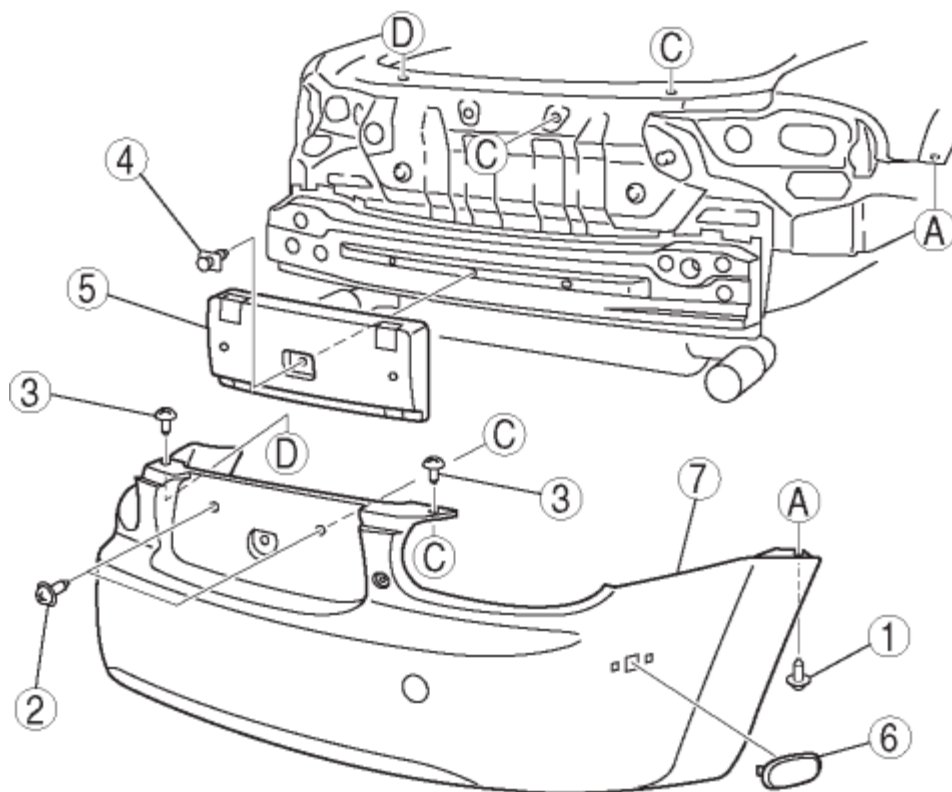
## 2008 - MX-5 - Body and Accessories

### REAR BUMPER REMOVAL/INSTALLATION

1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
2. Remove the trunk end trim. (See [TRUNK END TRIM REMOVAL/INSTALLATION](#).)
3. Remove the partition board. (See [PARTITION BOARD REMOVAL/INSTALLATION](#).)
4. Remove the trunk side trim. (See [TRUNK SIDE TRIM REMOVAL/INSTALLATION](#).)
5. Remove the rear combination lights. (See [REAR COMBINATION LIGHT REMOVAL/INSTALLATION](#).)
6. Remove the screws.
7. Splash shield, detach tabs A, and then remove the splash shield.



8. Remove in the order indicated in the table.



1	Screw A
2	Screw B
3	Screw C
4	Fastener A
5	Energy absorbing form
6	Reflector (See <a href="#">Reflector Removal Note.</a> )
7	Rear bumper (See <a href="#">Rear Bumper Removal Note.</a> ) (See <a href="#">Rear bumper Installation Note.</a> )

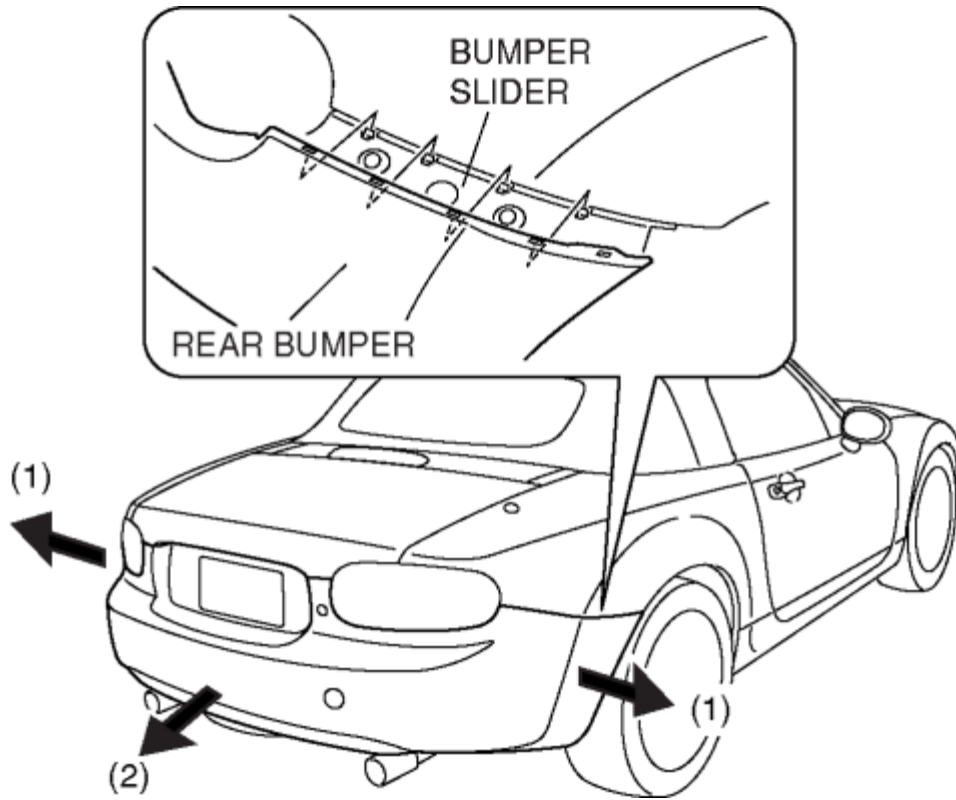
9. Install in the reverse order of removal.

## Rear Bumper Removal Note

1. Pull the rear bumper ends (wheel arch) outward to detach from the bumper slider.

**CAUTION:**

- When detaching the rear bumper from the bumper slider, the rear bumper could fall and be damaged. Secure the rear bumper so that it does not fall.

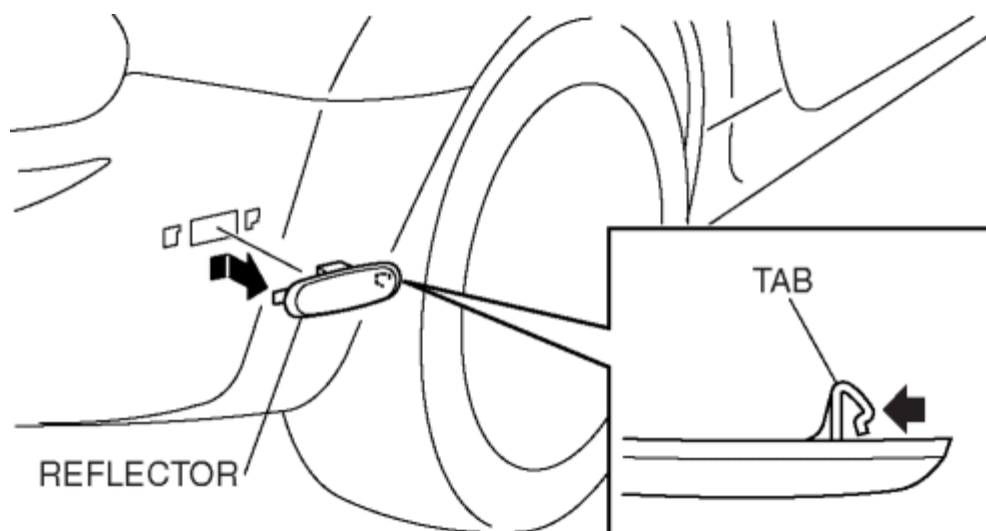


**Rear bumper Installation Note**

1. Spread the rear bumper ends (wheel arches) apart.
2. Attach the rear bumper to the body.
3. Press the rear bumper connecting area into the body to engage with the bumper slider.

**Reflector Removal Note**

1. Lift the reflector up in the direction of the arrow, then unhook it from rear bumper.



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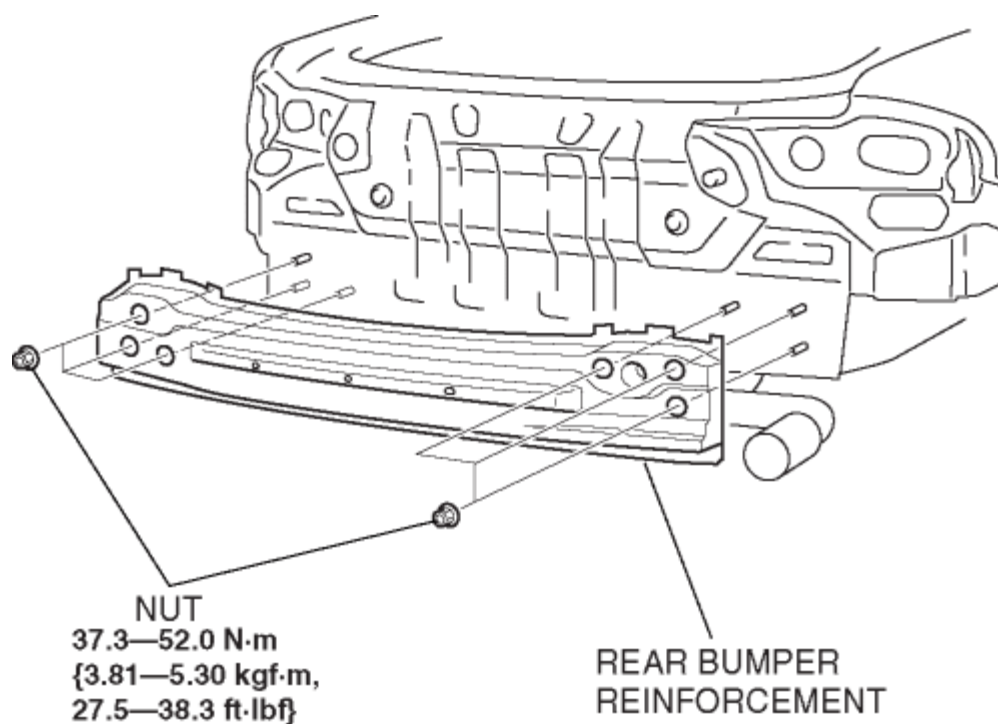
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## 2008 - MX-5 - Body and Accessories

### REAR BUMPER REINFORCEMENT REMOVAL/INSTALLATION

1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
2. Remove the following parts:
  - a. Trunk end trim (See [TRUNK END TRIM REMOVAL/INSTALLATION](#).)
  - b. Partition board (See [PARTITION BOARD REMOVAL/INSTALLATION](#).)
  - c. Trunk side trim (See [TRUNK SIDE TRIM REMOVAL/INSTALLATION](#).)
  - d. Rear combination lights (See [REAR COMBINATION LIGHT REMOVAL/INSTALLATION](#).)
  - e. Rear bumper (See [REAR BUMPER REMOVAL/INSTALLATION](#).)
3. Remove the nuts, then remove the rear bumper reinforcement.

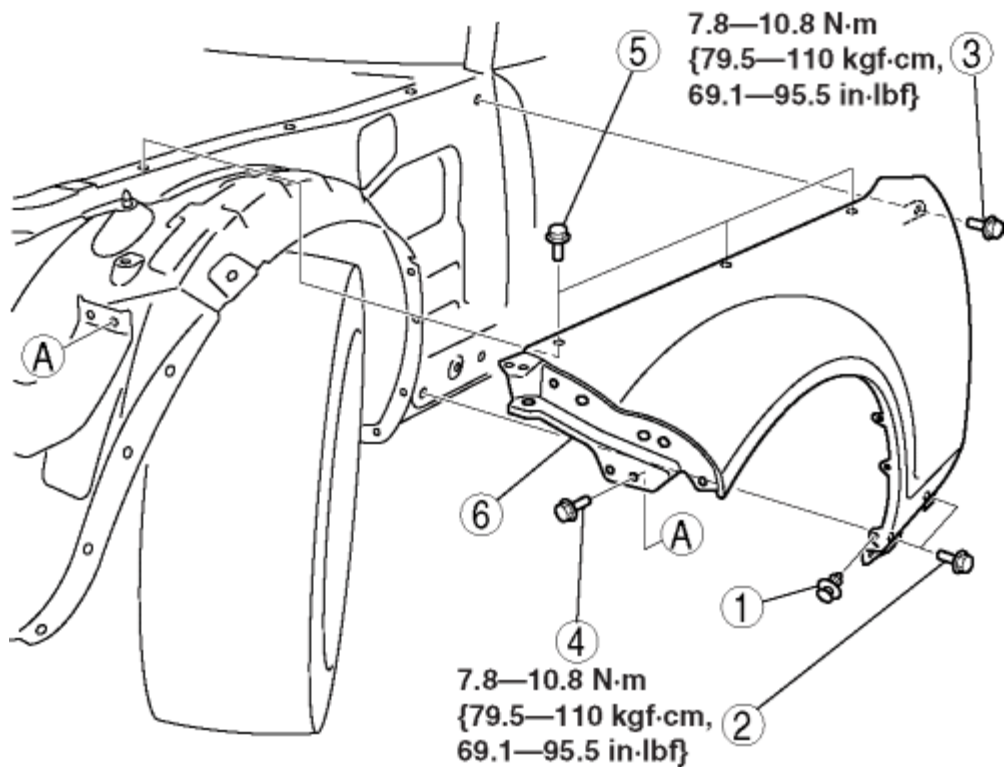


4. Install in the reverse order of removal.

2008 - MX-5 - Body and Accessories

FRONT FENDER PANEL REMOVAL/INSTALLATION

- 1. Disconnect the negative battery cable. (SeeBATTERY REMOVAL/INSTALLATION [LF].)
- 2. Remove the front bumper. (See FRONT BUMPER REMOVAL/INSTALLATION.)
- 3. Remove the front combination lights. (See FRONT COMBINATION LIGHT REMOVAL/INSTALLATION.)
- 4. Remove the side step molding. (SeeSIDE STEP MOLDING REMOVAL.) (SeeSIDE STEP MOLDING INSTALLATION.)
- 5. Remove in the order indicated in the table.



1	Fastener
2	Bolt A
3	Bolt B
4	Bolt C

5	Bolt D
6	Front fender panel

6. Install in the reverse order of removal.

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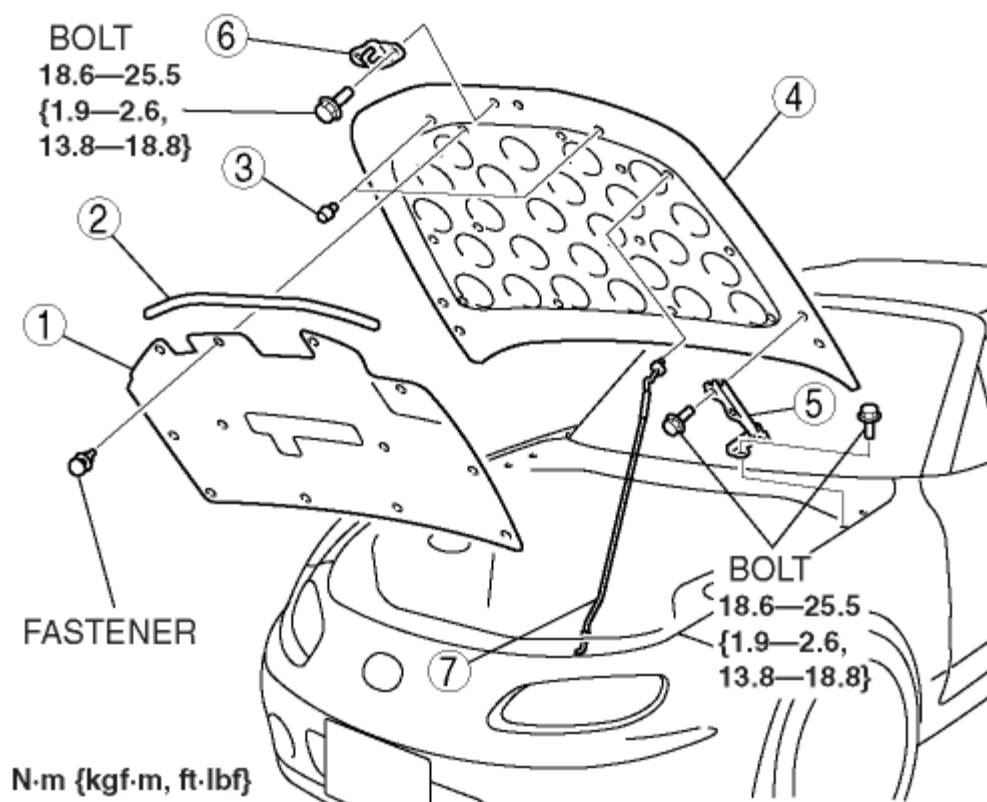
## 2008 - MX-5 - Body and Accessories

### HOOD REMOVAL/INSTALLATION

#### WARNING:

- Removing the hood without proper support can be dangerous. The hood may fall and injure you. Always perform the following procedure with at least another person.

1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
2. To remove the hood hinge, remove the following parts:
  - a. Front bumper (See [FRONT BUMPER REMOVAL/INSTALLATION](#).)
  - b. Front combination lights (See [FRONT COMBINATION LIGHT REMOVAL/INSTALLATION](#).)
  - c. Side step molding (See [SIDE STEP MOLDING REMOVAL](#).) (See [SIDE STEP MOLDING INSTALLATION](#).)
  - d. Front fender panel (See [FRONT FENDER PANEL REMOVAL/INSTALLATION](#).)
3. Remove in the order indicated in the table.



2	Shroud seal weatherstrip
3	Cushion rubber
4	Hood
5	Hood hinge
6	Hood striker
7	Hood stay

4. Install in the reverse order of removal.
5. Adjust the hood. (See [HOOD ADJUSTMENT](#).)

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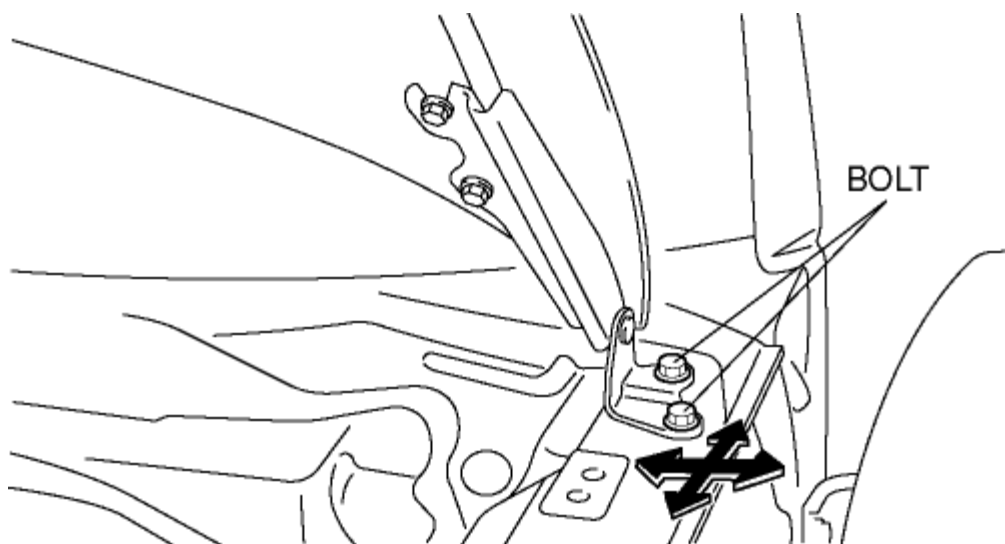
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## 2008 - MX-5 - Body and Accessories

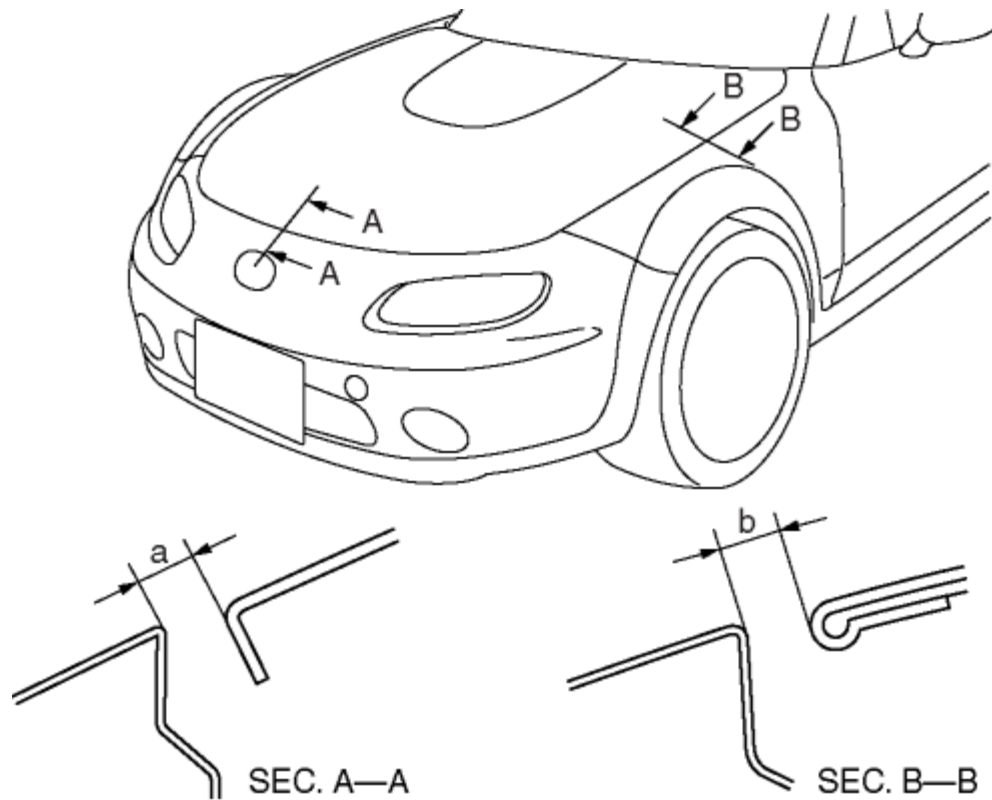
### HOOD ADJUSTMENT

#### Gap Adjustment

1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
2. Remove the following parts:
  - a. Front bumper (See [FRONT BUMPER REMOVAL/INSTALLATION](#).)
  - b. Front combination lights (See [FRONT COMBINATION LIGHT REMOVAL/INSTALLATION](#).)
  - c. Side step molding (See [SIDE STEP MOLDING REMOVAL](#).) (See [SIDE STEP MOLDING INSTALLATION](#).)
  - d. Front fender panel (See [FRONT FENDER PANEL REMOVAL/INSTALLATION](#).)
3. Loosen the hood hinge installation bolts and adjust the hood.



4. Tighten the bolts.
5. Verify that the gap between the hood and the body is within the specification.

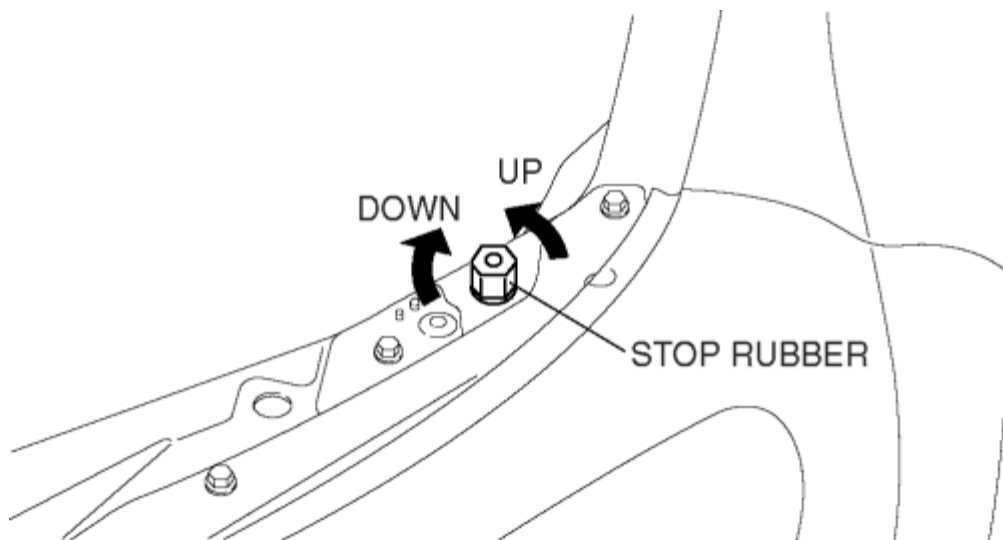


#### Standard clearance

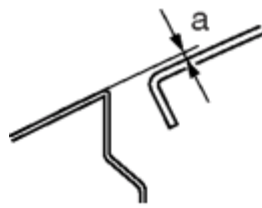
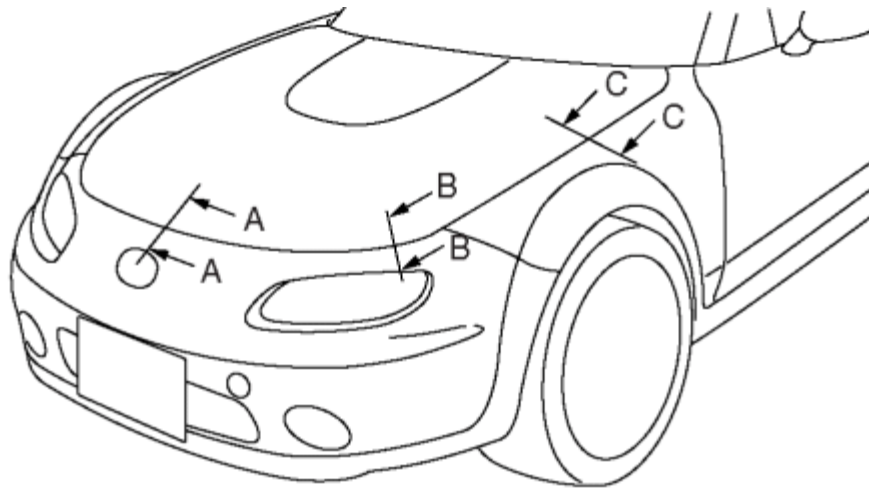
- a: 3.5—6.5 mm {0.14—0.25 in}
- b: 3.0—5.0 mm {0.12—0.19 in}

#### Height Difference Adjustment

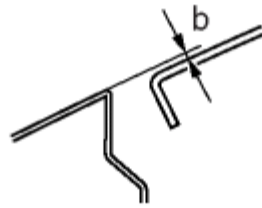
1. Turn the stop rubber to adjust the height of the hood.



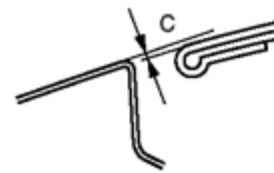
2. Verify that the height difference between the hood and the body is within the specification.



SEC. A—A



SEC. B—B



SEC. C—C

#### Standard clearance

- a:  $-1.0-2.0\text{mm}$   $\{-0.04-0.07\text{ in}\}$
- b:  $-1.5-1.5\text{ mm}$   $\{-0.06-0.05\text{ in}\}$
- c:  $-0.5-1.5\text{ mm}$   $\{-0.02-0.05\text{ in}\}$

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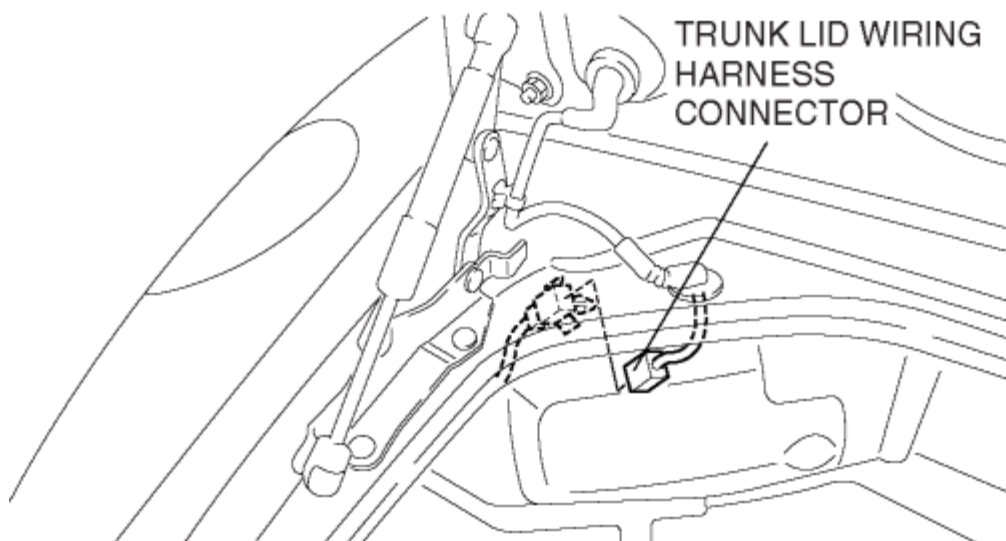
## 2008 - MX-5 - Body and Accessories

### TRUNK LID REMOVAL/INSTALLATION

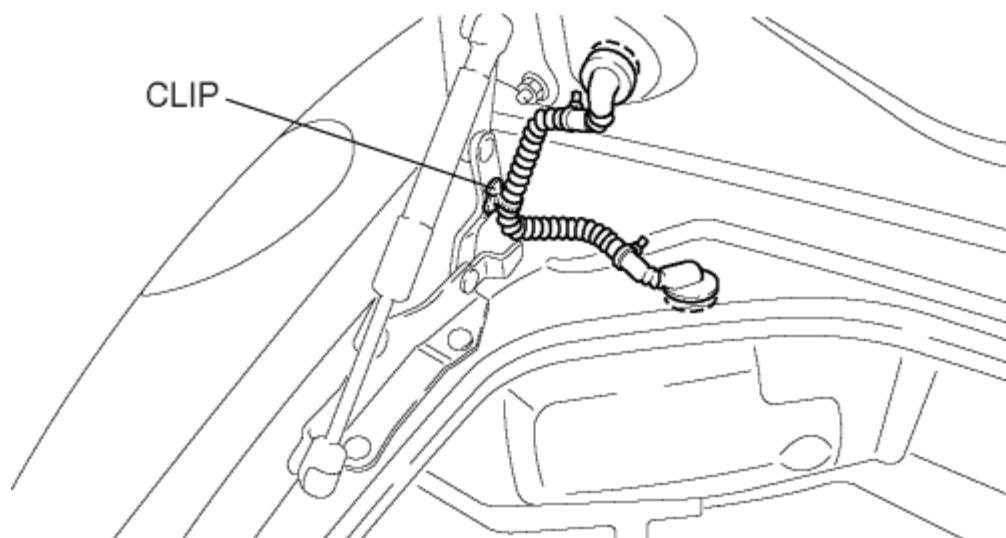
#### WARNING:

- Removing the stay damper without supporting the trunk lid can be dangerous. The trunk lid may fall and injure you. Be sure to open the trunk lid completely and support it securely before removing the stay damper.

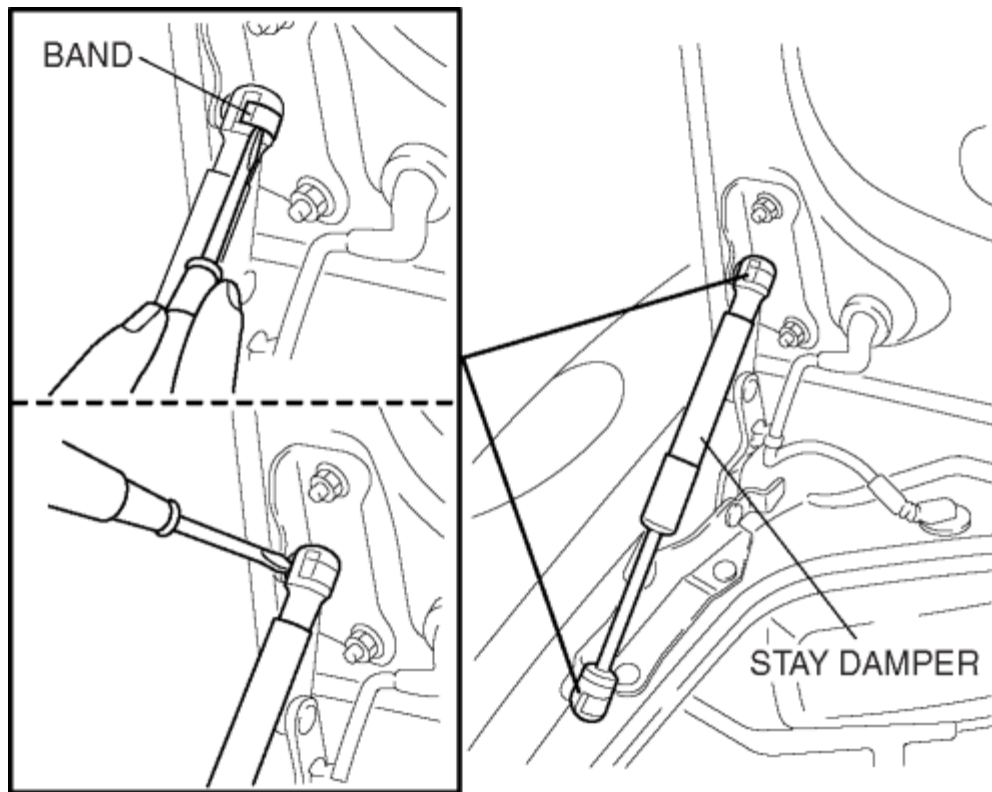
1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
2. Disconnect the trunk lid wiring harness connector, then take the trunk lid harness out from the vehicle.



3. Remove the clips that secure the trunk lid wiring harness.

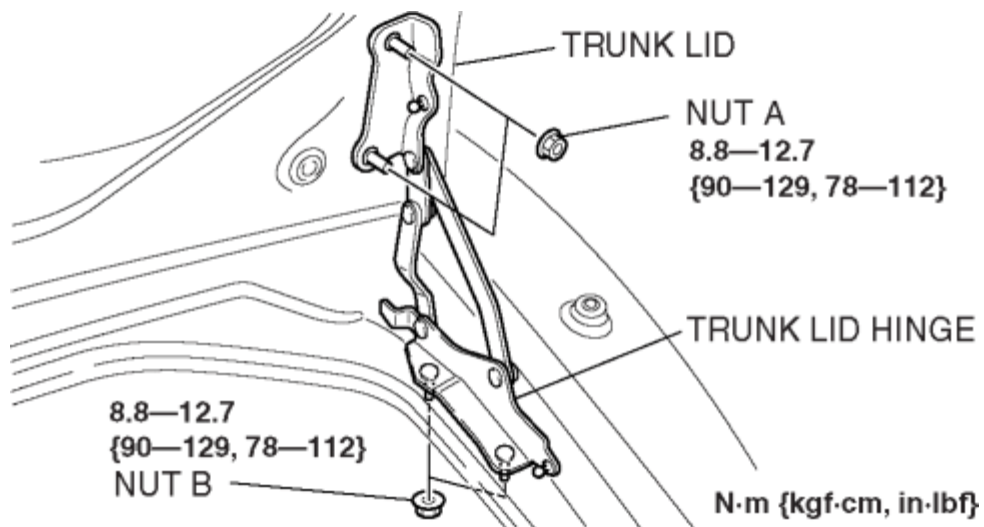


4. Pry off the stay damper band using a flathead screwdriver.



5. Pry out the connecting part of the stay damper and the hinge with a flathead screwdriver to disconnect them, then remove the stay damper.

6. Remove nuts A, then remove the trunk lid.



7. Remove nuts B, then remove the trunk lid hinge.

8. Install in the reverse order of removal.

9. Adjust the trunk lid. (See [TRUNK LID ADJUSTMENT](#))

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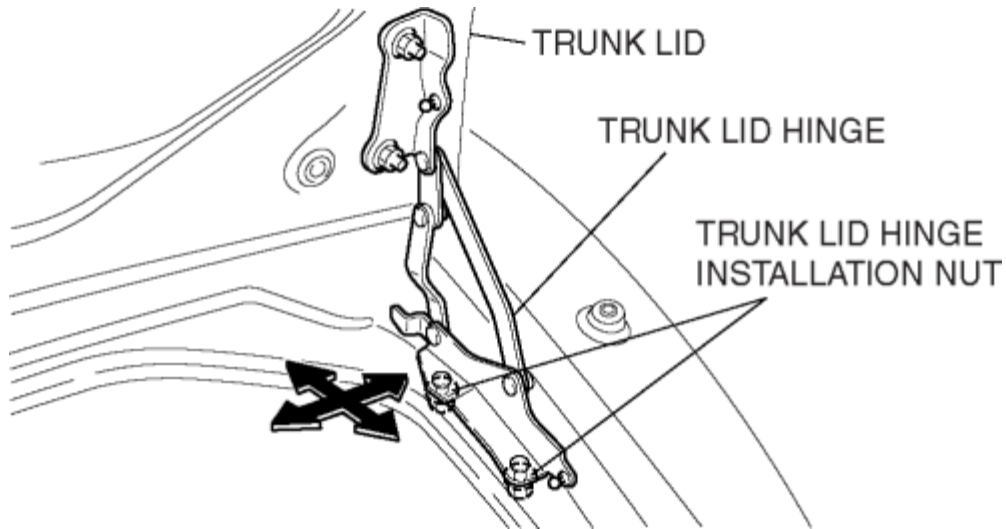
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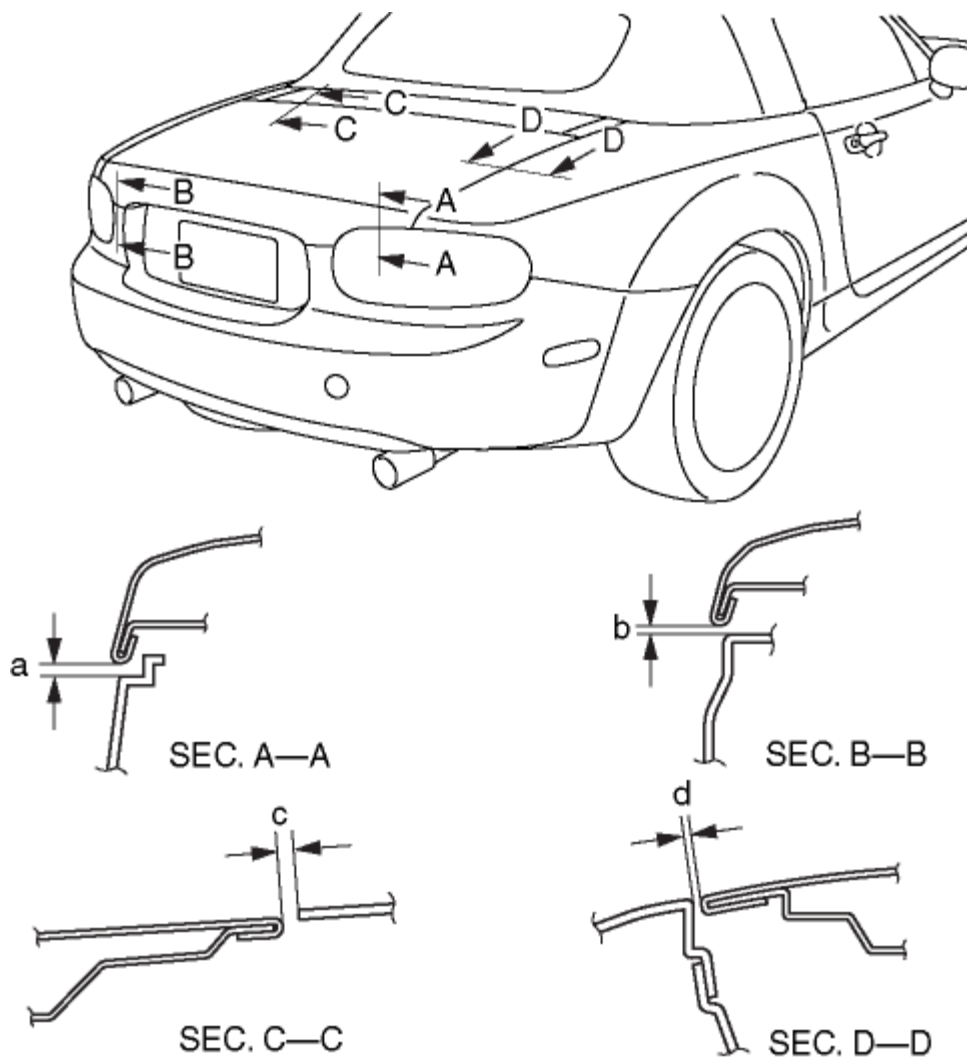
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## 2008 - MX-5 - Body and Accessories

### TRUNK LID ADJUSTMENT

1. Measure the gap and height difference between the trunk lid and the body.
2. Loosen the trunk lid hinge installation nuts or the trunk lid lock striker installation screws, and adjust the trunk lid.





### Standard clearance

- a: 4.5—7.5 mm {0.18—0.29 in} (Except Power Retractable Hardtop)
- a: 5.5—8.5 mm {0.22—0.33 in} (Power Retractable Hardtop)
- b: 5.0—9.0 mm {0.20—0.35 in}
- c: 3.0—6.0 mm {0.12—0.23 in} (Except Power Retractable Hardtop)
- c: 4.0—8.0 mm {0.16—0.31 in} (Power Retractable Hardtop)
- d: 3.0—5.0 mm {0.12—0.19 in}

3. Tighten the nuts.

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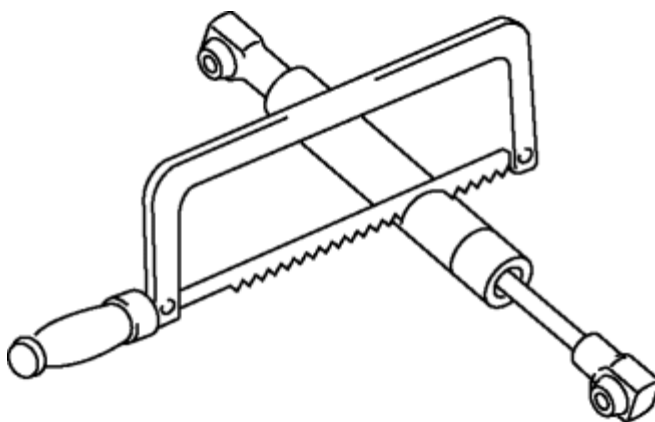
## 2008 - MX-5 - Body and Accessories

### STAY DAMPER DISPOSAL

#### NOTE:

- The gas in the stay damper is colorless, odorless, and non-toxic.

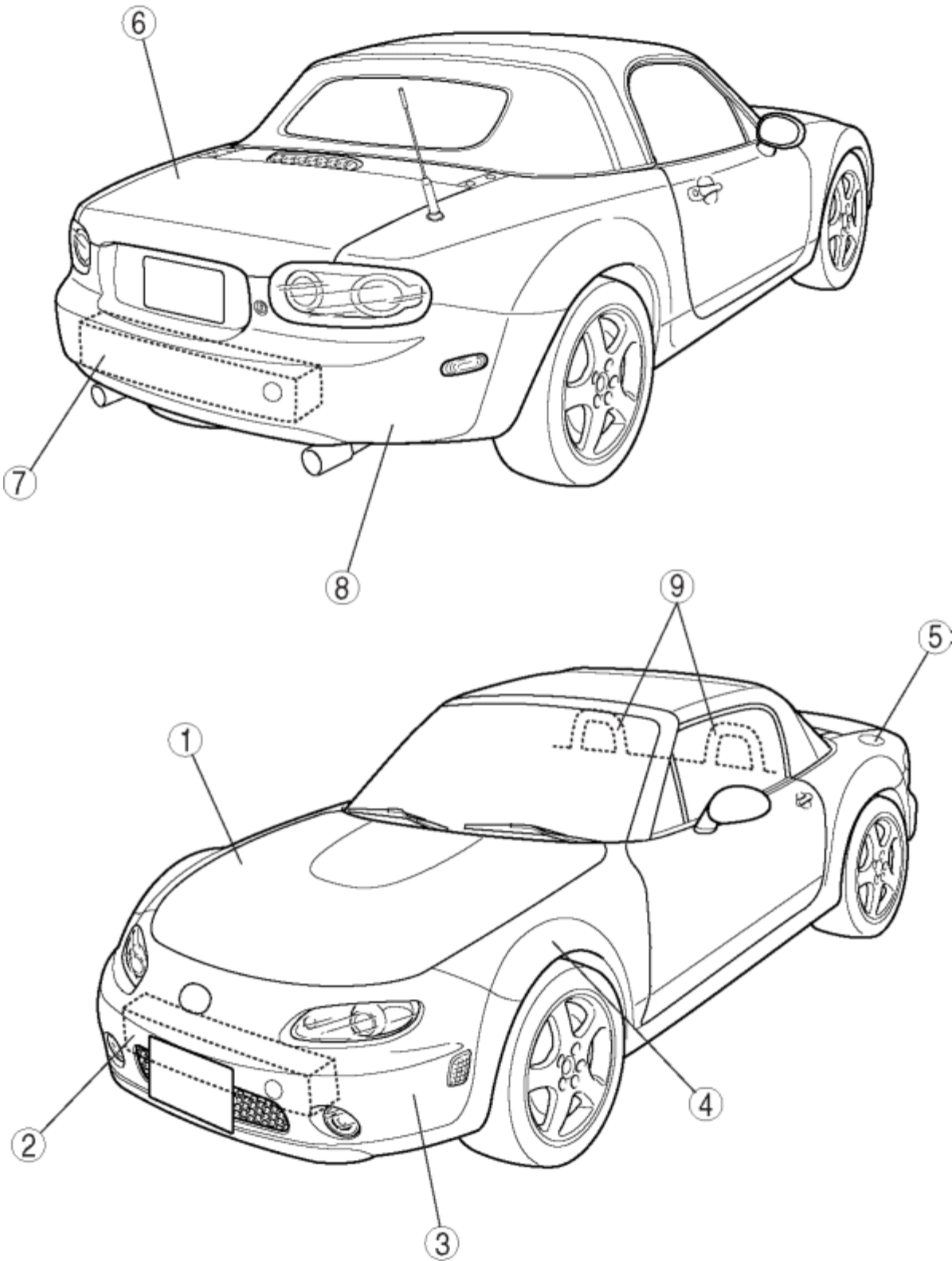
1. Wear protective eye wear.
2. Lay the stay damper flat.



3. Saw **2—3 mm {0.08—0.11 in}** into the stay damper using a hacksaw, and allow the gas to escape from the stay damper.
4. Verify that the gas has escaped from the stay damper.
5. Discard the stay damper.

2008 - MX-5 - Body and Accessories

BODY PANELS LOCATION INDEX



	Hood
1	(See <a href="#">HOOD REMOVAL/INSTALLATION.</a> ) (See <a href="#">HOOD ADJUSTMENT.</a> )
2	Front bumper reinforcement (See <a href="#">FRONT BUMPER REINFORCEMENT REMOVAL/INSTALLATION.</a> )
3	Front bumper (See <a href="#">FRONT BUMPER REMOVAL/INSTALLATION.</a> ) (See <a href="#">FRONT BUMPER DISASSEMBLY/ASSEMBLY.</a> )
4	Front fender panel (See <a href="#">FRONT FENDER PANEL REMOVAL/INSTALLATION.</a> )
5	Fuel-filler lid (See <a href="#">FUEL-FILLER LID REMOVAL/INSTALLATION.</a> ) (See <a href="#">FUEL-FILLER LID ADJUSTMENT.</a> )
6	Trunk lid (See <a href="#">TRUNK LID REMOVAL/INSTALLATION.</a> ) (See <a href="#">TRUNK LID ADJUSTMENT.</a> )
7	Rear bumper reinforcement (See <a href="#">REAR BUMPER REINFORCEMENT REMOVAL/INSTALLATION.</a> )
8	Rear bumper (See <a href="#">REAR BUMPER REMOVAL/INSTALLATION.</a> )
9	Seat Back Crossmember Assembly (See <a href="#">SEAT BACK CROSSMEMBER ASSEMBLY REMOVAL/INSTALLATION.</a> )

## 2008 - MX-5 - Body and Accessories

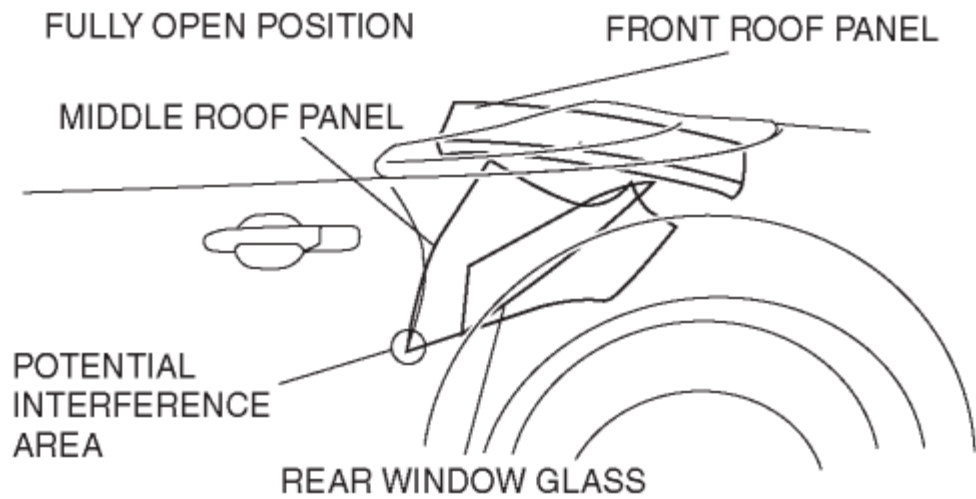
### SEAT BACK CROSSMEMBER ASSEMBLY REMOVAL/INSTALLATION

1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
2. Remove the console. (See [CONSOLE REMOVAL/INSTALLATION](#).)
3. Remove the quarter trim. (See [QUARTER TRIM REMOVAL/INSTALLATION](#).)
4. Remove the scuff plate. (See [SCUFF PLATE REMOVAL/INSTALLATION](#).)
5. Remove the tire house trim. (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION](#).)
6. Remove the aeroboard. (See [AEROBOARD REMOVAL/INSTALLATION](#).)
7. Remove the seat back bar garnish. (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION](#).)
8. Remove the open hook lever. (See [BACK TRIM REMOVAL/INSTALLATION](#).)
9. Remove the back trim. (See [BACK TRIM REMOVAL/INSTALLATION](#).)
10. Remove the open hook. (See [OPEN HOOK REMOVAL/INSTALLATION \[ADVANCED KEYLESS SYSTEM\]](#).)
11. Remove the rear speaker. (See [REAR SPEAKER REMOVAL/INSTALLATION](#).)
12. Remove the seat belt set plate. (See [SEAT BELT REMOVAL/INSTALLATION](#).)
13. Seat belt upper anchor installation bolt. (See [SEAT BELT REMOVAL/INSTALLATION](#).)
14. Remove the power retractable hardtop link bracket. (Vehicle with power retractable hardtop) (See [POWER RETRACTABLE HARDTOP LINK BRACKET REMOVAL/INSTALLATION](#).)
15. Half open the power retractable hardtop.

#### CAUTION:

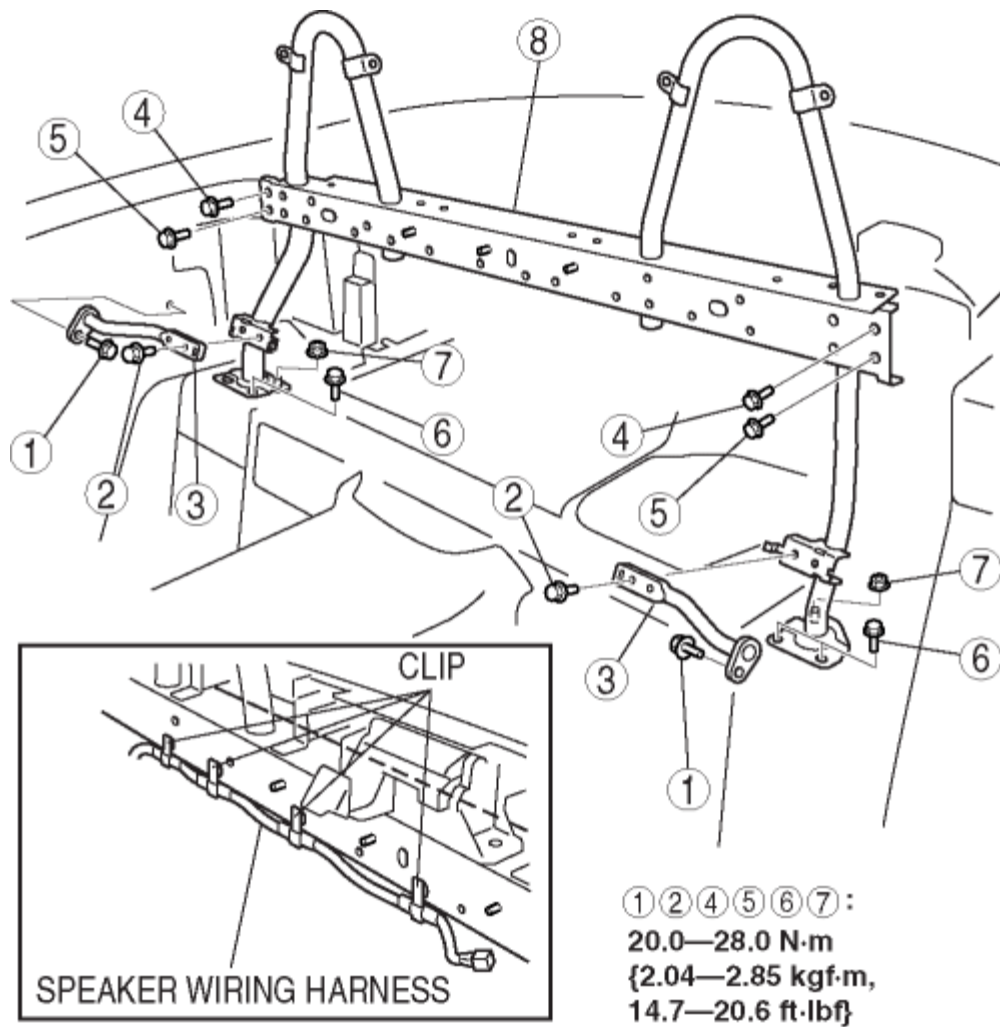
- If the seat back crossmember component is removed with the power retractable hardtop fully opened, it may contact the middle roof and damage the roof. Half open the power retractable hardtop before removing the seat back crossmember component.





16. Remove the clips, then remove the speaker wiring harness.

17. Remove in the order indicated in the table.



1 Bolt A

2 Bolt B

3	Junction
4	Bolt C (Except power retractable hardtop)
5	Bolt D (Except power retractable hardtop)
6	Bolt E
7	Nut
8	Seat Back Crossmember Assembly (See <a href="#">Seat Back Crossmember Assembly Installation Note.</a> )

18. Install in the reverse order of removal.

### Seat Back Crossmember Assembly Installation Note

1. After temporarily tightening all of the bolts and nuts, tighten them to the specified torque.

#### Tightening torque

- 20.0—28.0 N·m {2.04—2.85 kgf·m, 14.7—20.6 ft·lbf}

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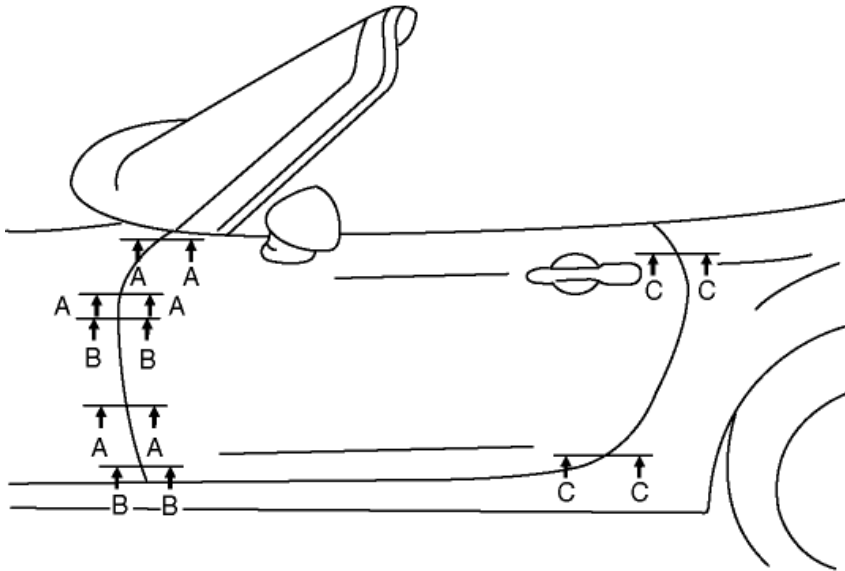
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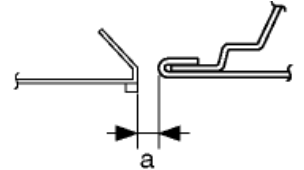
## 2008 - MX-5 - Body and Accessories

### DOOR ADJUSTMENT

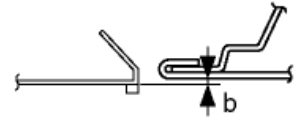
1. Measure the gap and height difference between the door and the body.
2. Loosen the door hinge installation bolts or the door lock striker installation screws, and adjust the door.
3. Tighten the bolts or screws.



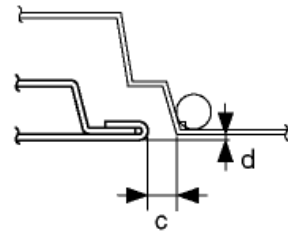
SEC. A—A



SEC. B—B



SEC. C—C

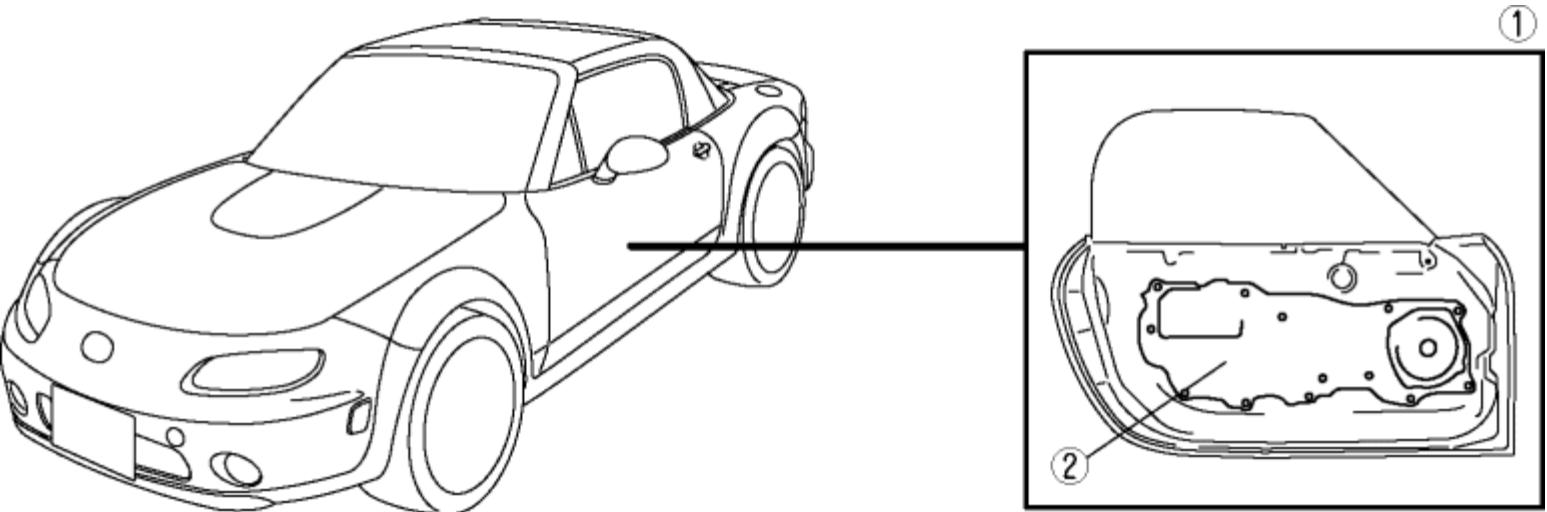


#### Standard clearance

- A—A top and bottom (a): 3.1—5.0 mm {0.13—0.19in}
- A—A middle (a): 3.3—5.2 mm {0.13—0.20 in}
- B—B top (b): -1.0—1.0 mm {-0.040—0.039 in}
- B—B bottom (b): -0.5—1.5 mm {-0.020—0.059 in}
- C—C top and bottom (c): 3.0—5.0 mm {0.12—0.19 in}
- C—C top (c): -1.0—1.0 mm {-0.040—0.039 in}
- C—C bottom (d): -0.5—1.5 mm {-0.020—0.059 in}

2008 - MX-5 - Body and Accessories

DOORS LOCATION INDEX

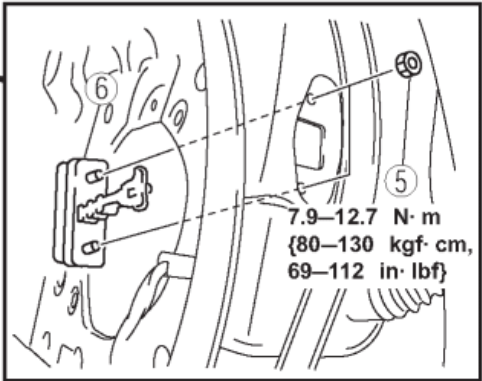
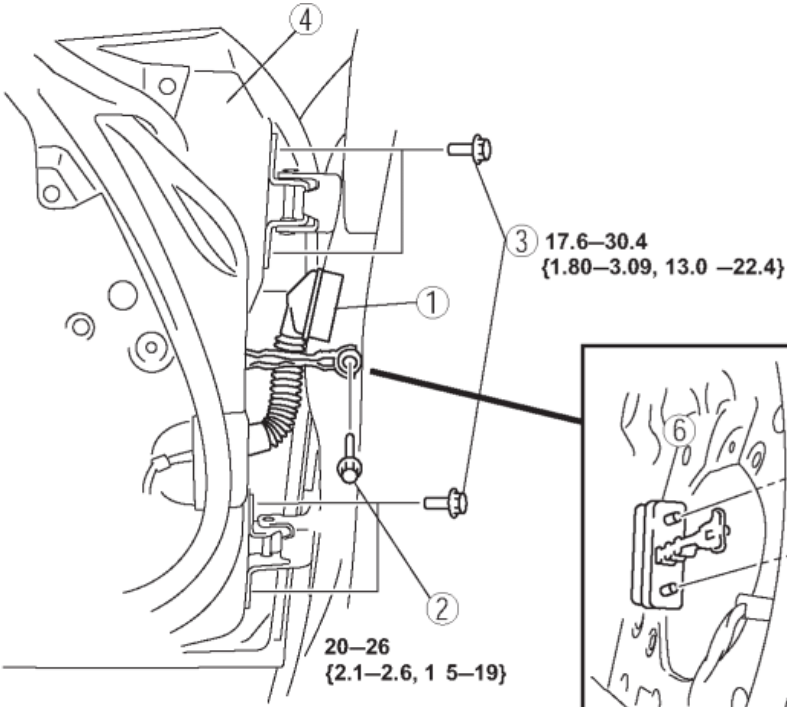
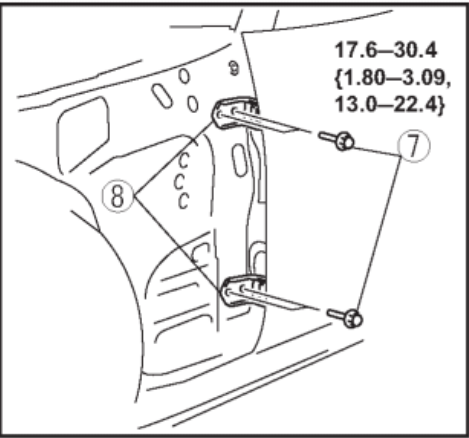


1	Door (See <a href="#">FRONT DOOR REMOVAL/INSTALLATION.</a> ) (See <a href="#">DOOR ADJUSTMENT.</a> )
2	Door unit (See <a href="#">DOOR UNIT REMOVAL/INSTALLATION.</a> )

2008 - MX-5 - Body and Accessories

FRONT DOOR REMOVAL/INSTALLATION

- 1. Disconnect the negative battery cable.(SeeBATTERY REMOVAL/INSTALLATION [LF].)
- 2. To remove the door stay (checker), remove the following parts:
  - a. Door trim (See DOOR TRIM REMOVAL/INSTALLATION.)
  - b. Door speaker (See DOOR SPEAKER REMOVAL/INSTALLATION.)
- 3. To remove the door hinges, remove the following parts:
  - a. Front bumper (See FRONT BUMPER REMOVAL/INSTALLATION.)
  - b. Front combination lights (See FRONT COMBINATION LIGHT REMOVAL/INSTALLATION.)
  - c. Side step molding (See SIDE STEP MOLDING REMOVAL.) (See SIDE STEP MOLDING INSTALLATION.)
  - d. Mad guard
  - e. Front fender panel (See FRONT FENDER PANEL REMOVAL/INSTALLATION.)
- 4. Remove in the order indicated in the table.
- 5. Install in the reverse order of removal.
- 6. Adjust the door. (See DOOR ADJUSTMENT.)



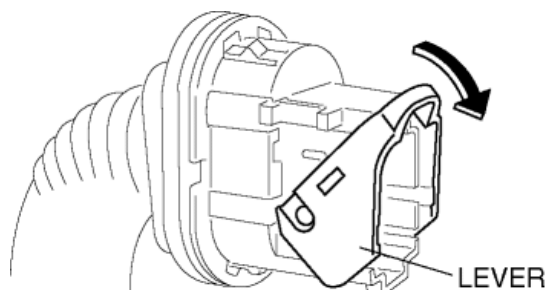
N·m {kgf·m, ft·lbf}

1	Connector (See Connector Removal Note.)
2	Bolt A
3	Bolt B

4	Door
5	Nut
6	Door stay (checker)
7	Bolt C
8	Door hinge

#### Connector Removal Note

1. Pull down the lever in the direction indicated by the arrow and disconnect the connector.



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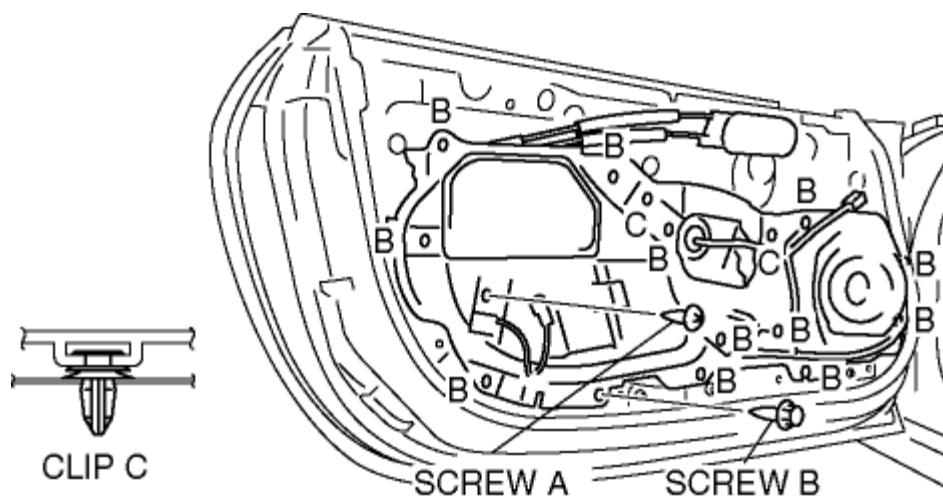
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## 2008 - MX-5 - Body and Accessories

### DOOR UNIT REMOVAL/INSTALLATION

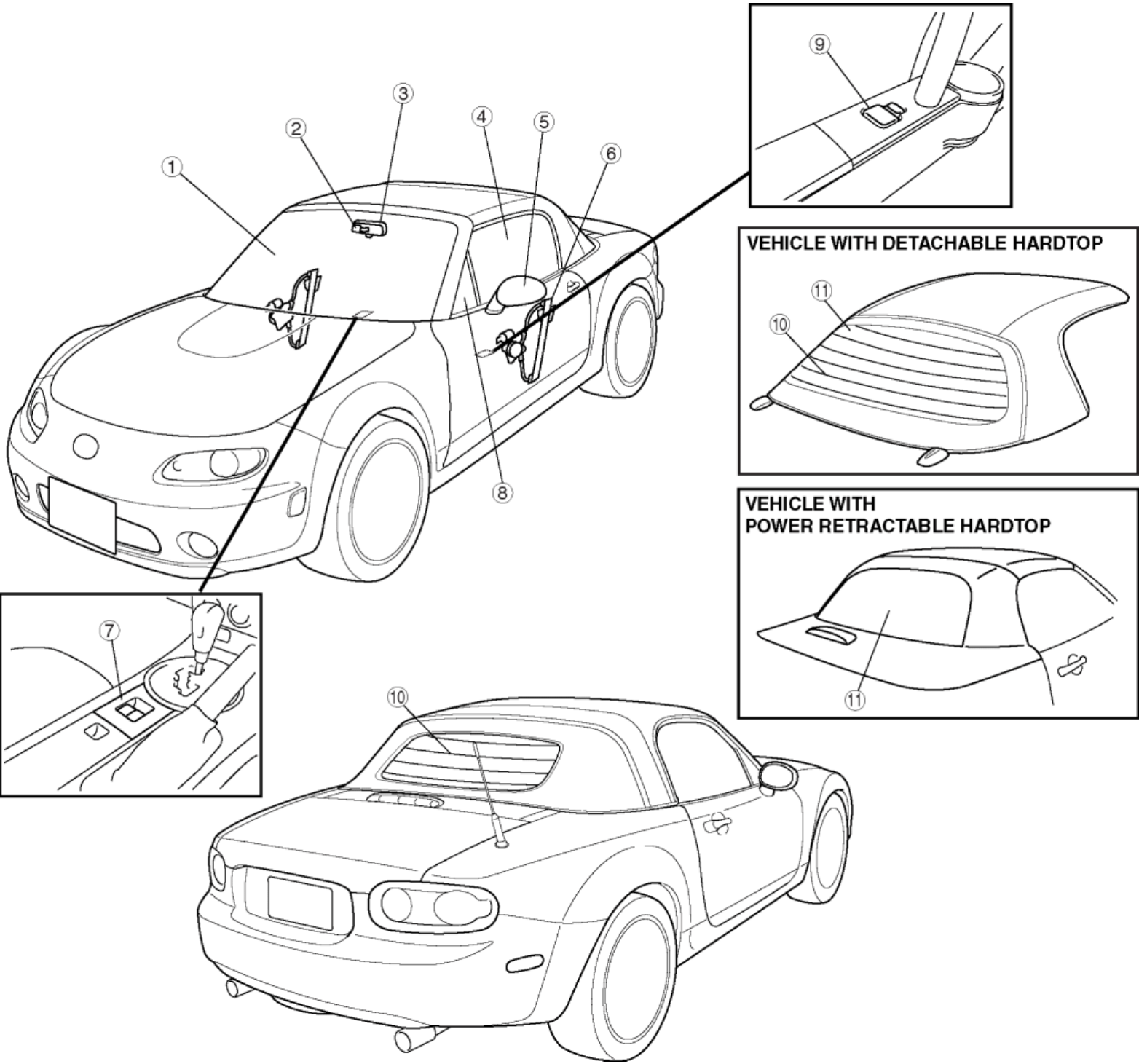
1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
2. Remove the following parts:
  - a. Door trim (See [DOOR TRIM REMOVAL/INSTALLATION](#).)
  - b. Door speaker (See [DOOR SPEAKER REMOVAL/INSTALLATION](#).)
3. Disconnect the power outer mirror harness connector.
4. Disconnect the door lock actuator connector.
5. Disconnect the power window motor connector.
6. Remove screws A and B.
7. Pull the door unit outward and detach clips C.



8. Remove the door unit.
9. Install in the reverse order of removal.

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GLASS/WINDOWS/MIRRORS LOCATION INDEX



- 1 Windshield  
(See [WINDSHIELD REMOVAL.](#))  
(See [WINDSHIELD INSTALLATION.](#))

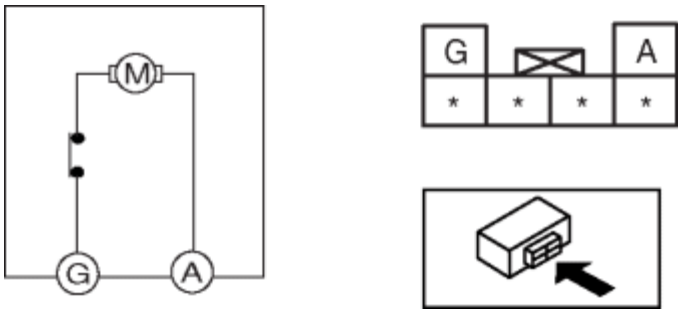


2	Base  (See <a href="#">BASE REMOVAL.</a> )  (See <a href="#">BASE INSTALLATION.</a> )
3	Rearview mirror  (See <a href="#">REARVIEW MIRROR REMOVAL/INSTALLATION.</a> )
4	Door glass  (See <a href="#">DOOR GLASS REMOVAL/INSTALLATION.</a> )  (See <a href="#">DOOR GLASS ADJUSTMENT.</a> )
5	Power outer mirror  (See <a href="#">POWER OUTER MIRROR REMOVAL/INSTALLATION.</a> )  (See <a href="#">POWER OUTER MIRROR DISASSEMBLY/ASSEMBLY.</a> )  (See <a href="#">POWER OUTER MIRROR INSPECTION.</a> )
6	Power window regulator  (See <a href="#">POWER WINDOW REGULATOR REMOVAL/INSTALLATION.</a> )  (See <a href="#">POWER WINDOW REGULATOR DISASSEMBLY/ASSEMBLY.</a> )  (See <a href="#">POWER WINDOW MOTOR INSPECTION.</a> )
7	Power window main switch  (See <a href="#">POWER WINDOW MAIN SWITCH REMOVAL/INSTALLATION.</a> )  (See <a href="#">POWER WINDOW MAIN SWITCH INSPECTION.</a> )
8	Door quarter glass  (See <a href="#">DOOR QUARTER GLASS REMOVAL/INSTALLATION.</a> )
9	Power outer mirror switch  (See <a href="#">POWER OUTER MIRROR SWITCH REMOVAL/INSTALLATION.</a> )  (See <a href="#">POWER OUTER MIRROR SWITCH INSPECTION.</a> )
10	Rear window defroster filament  (See <a href="#">REAR WINDOW DEFROSTER FILAMENT INSPECTION.</a> )  (See <a href="#">REAR WINDOW DEFROSTER FILAMENT REPAIR.</a> )
11	Rear window glass  (See <a href="#">REAR WINDOW GLASS REMOVAL [DETACHABLE HARDTOP].</a> )  (See <a href="#">REAR WINDOW GLASS INSTALLATION [DETACHABLE HARDTOP].</a> )  (See <a href="#">REAR WINDOW GLASS REMOVAL/INSTALLATION[POWER RETRACTABLE HARDTOP].</a> )

2008 - MX-5 - Body and Accessories

POWER WINDOW MOTOR INSPECTION

1. Apply battery positive voltage to the power window motor terminals, and inspect the power window motor operation.



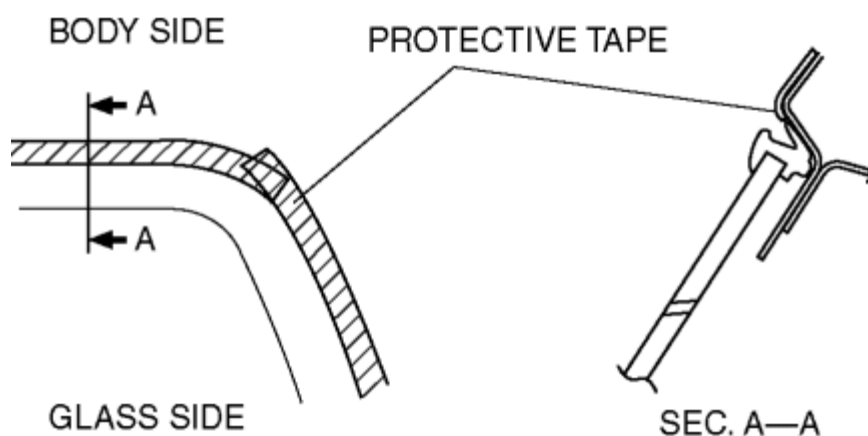
- If the power window motor does not operate as indicated in the table, replace it.

Operation	Terminal	
	G	A
Open	Ground	B+
Close	B+	Ground

## 2008 - MX-5 - Body and Accessories

### WINDSHIELD REMOVAL

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the following parts:
  - a. Wiper arm and blade (See [WIPER ARM AND BLADE REMOVAL/INSTALLATION](#).)
  - b. Cowl grille (See [COWL GRILLE REMOVAL/INSTALLATION](#).)
  - c. Side cowl grille (See [SIDE COWL GRILLE REMOVAL/INSTALLATION](#).)
  - d. Windshield garnish (See [WINDSHIELD GARNISH REMOVAL](#).)
  - e. Rearview mirror (See [REARVIEW MIRROR REMOVAL/INSTALLATION](#).)
  - f. Front header trim (See [FRONT HEADER TRIM REMOVAL/INSTALLATION](#).)
  - g. Map light (See [MAP LIGHT REMOVAL/INSTALLATION](#).)
  - h. A-pillar trim (See [A-PILLAR TRIM REMOVAL/INSTALLATION](#).)
4. Apply protective tape along the edge of the body.



#### NOTE:

- Overlap and adhere the protective tape to the corners to prevent damage.

5. Remove the windshield molding by pulling it outward.

#### NOTE:

- If the windshield molding is difficult to remove, warm the windshield molding using a hot air blower.
- The windshield molding is a replacement part.

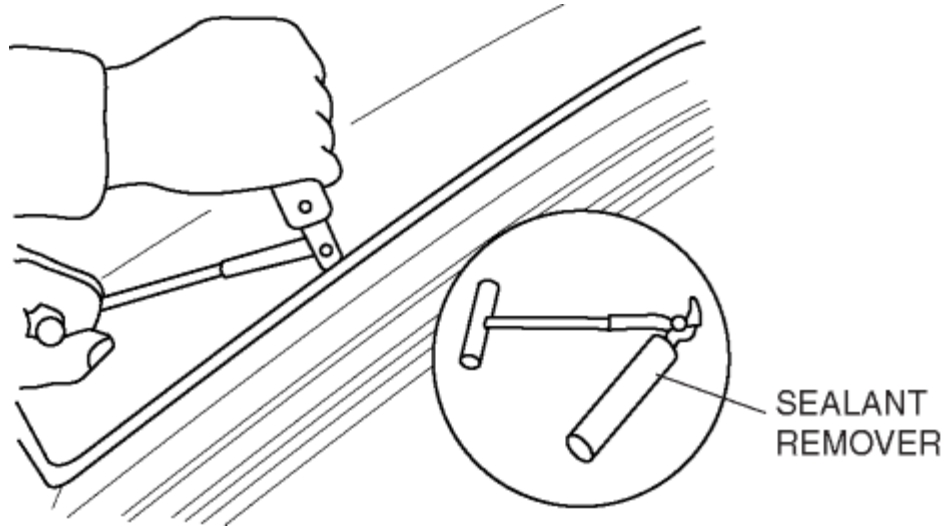
## Not Reusing Windshield

### NOTE:

- For the areas of the sealant that are difficult to cut, use the **SST** (piano wire) and follow the procedure under "Reusing Windshield".

### WARNING:

- Using the **SST** (piano wire) with bare hands can cause injury. Always wear gloves when using the **SST** (piano wire).
- Cut out the sealant all around the glass using a sealant remover.



- Remove the windshield.

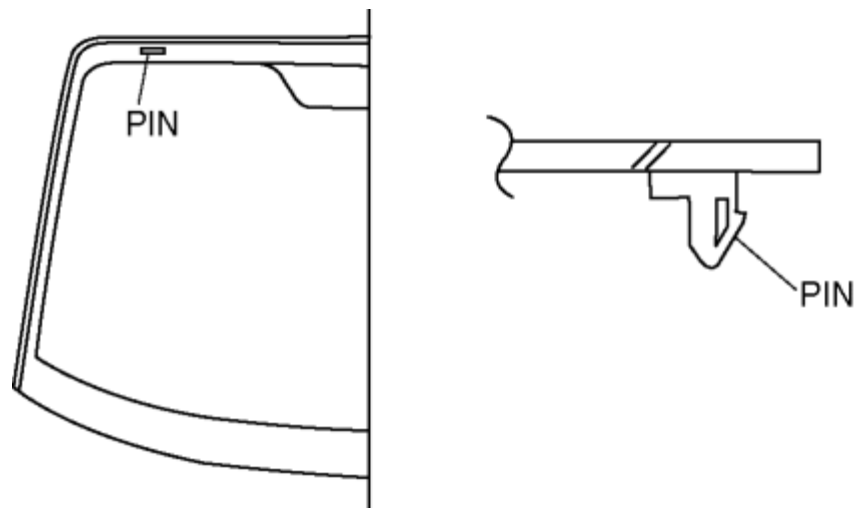
## Reusing Windshield

### WARNING:

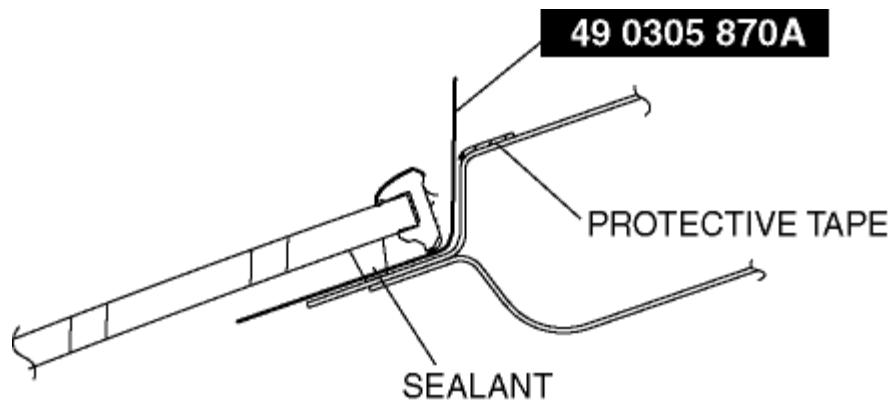
- Using the **SST** (piano wire) with bare hands can cause injury. Always wear gloves when using the **SST** (piano wire).

### NOTE:

- Before removing the windshield from the body, mark the position of the windshield by affixing tape to the windshield and body panel.
- Avoiding the pin on the inside of the vehicle, insert the **SST** (piano wire) which has been cut to sufficient length.



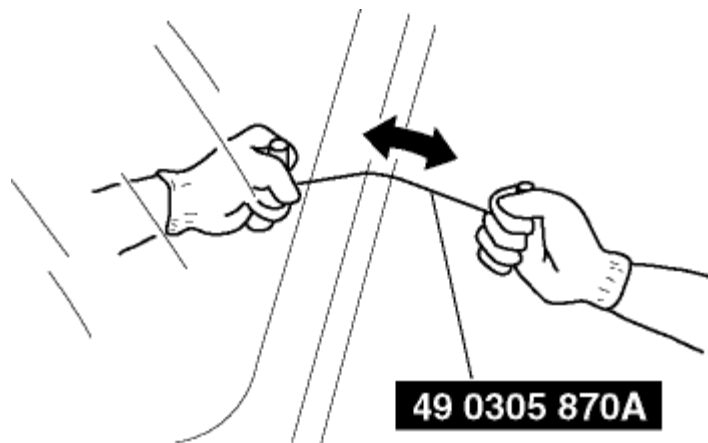
2. Wind each end of the **SST** (piano wire) around a bar.



**NOTE:**

- Use a long sawing action to spread the work over the whole length of the **SST** (piano wire) to prevent it from breaking due to localized heating.

3. Secure one end of the **SST** (piano wire), and while pulling the other end, cut the sealant around the windshield.



4. Pinch the pin from the inside of the vehicle and detach it.

5. Remove the windshield.

6. If the pin is damaged, remove the pin.

**NOTE:**

- Before removing the pin from the windshield glass, place an alignment mark on the windshield.

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## 2008 - MX-5 - Body and Accessories

### WINDSHIELD INSTALLATION

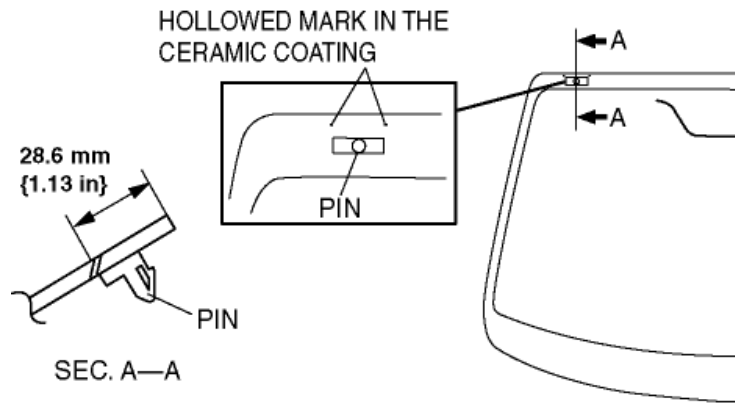
#### WARNING:

- Using a razor with bare hands can cause injury. Always wear gloves when using a razor.

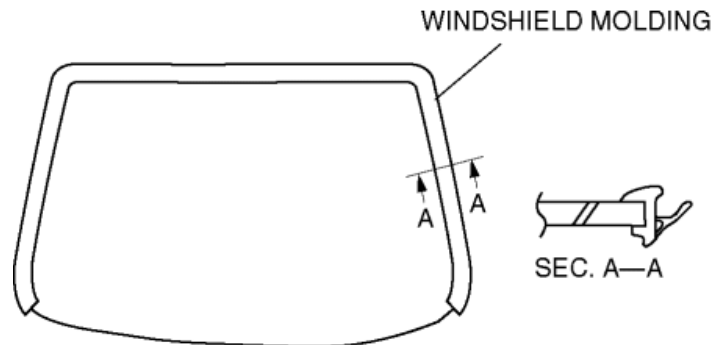
#### CAUTION:

- If a door is opened or closed when all the window glass is closed, the resulting change in air pressure could cause the sealant to crack preventing the proper installation of the glass. Keep the door glass opened until the windshield installation is completed.

1. Remove the sealant along the perimeter of the glass using a cutting a razor. (When reusing the glass)
2. Clean and degrease an **approx. 50 mm {2.0 in}** wide strip along the perimeter of the windshield.
3. Inspect the glass for cracks. If it is cracked, chamfer it using sandpaper.
4. Align the marks made before removal and install the pin to the windshield referring to the figure. (when reusing the glass, and the pin was removed)



5. Install the windshield molding.



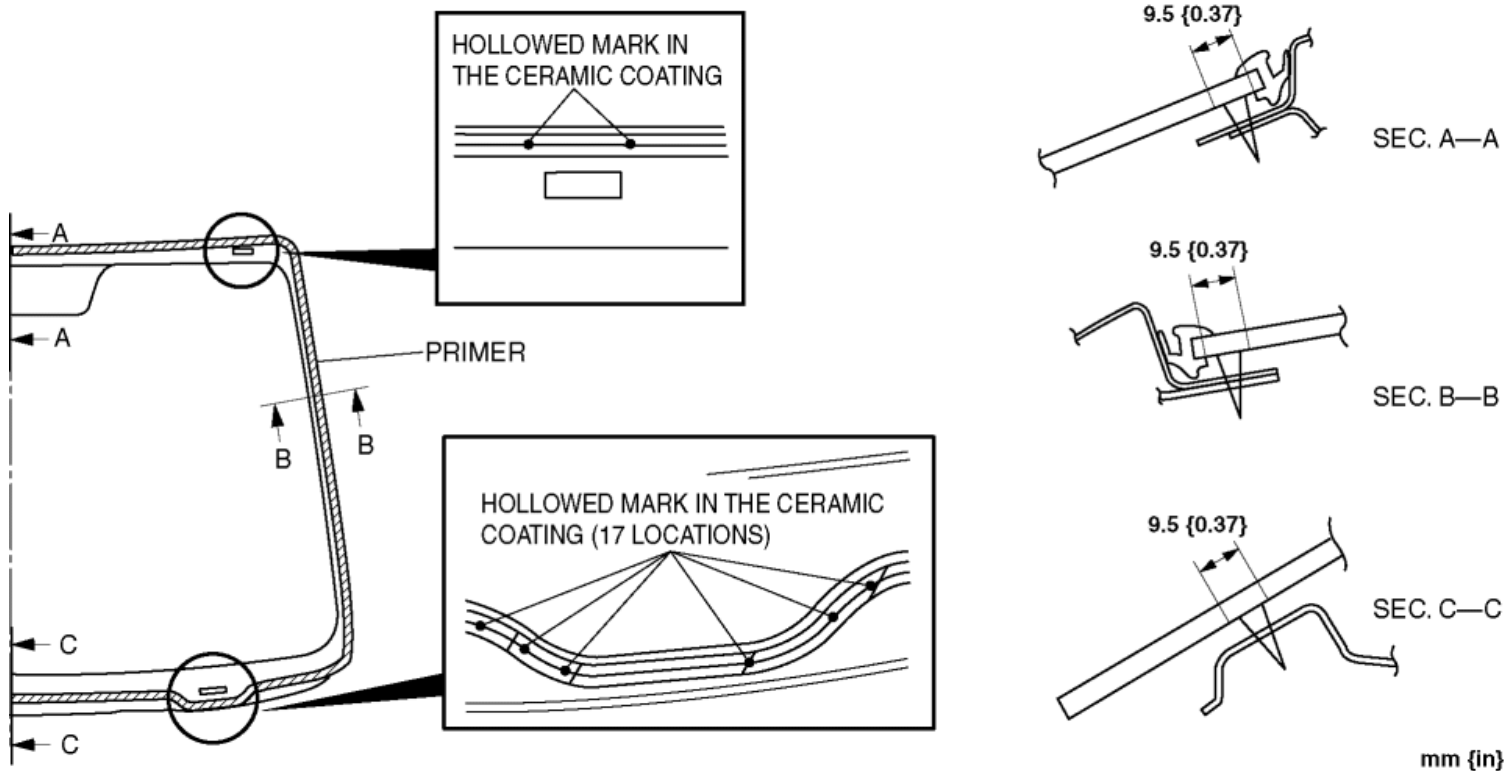
6. Use glass primer on the glass, then allow it to dry for **approx. 30 min.**

#### CAUTION:

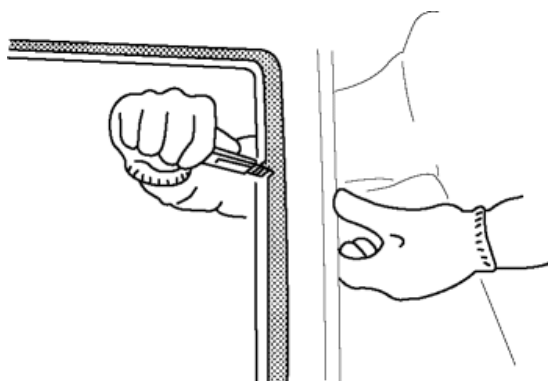
- To prevent weakening of the primer adhesion, keep the bonding surface free of dirt, moisture, and grease. Do not touch the surface with your hand.

#### NOTE:

- Make sure to apply primer to the hollowed marks in the ceramic coating.



7. Cut away the old sealant using a razor or scraper so that **1—2 mm {0.04—0.07 in}** thickness of sealant remains along the perimeter of the frame.



8. If the sealant has come off completely in any one place, apply some primer after degreasing, and allow it **approx. 30 min** to dry. Then apply **2 mm {0.07 in}** thickness of new sealant.

**CAUTION:**

- To prevent weakening of the primer adhesion, keep the bonding surface free of dirt, moisture, and grease. Do not touch the surface with your hand.

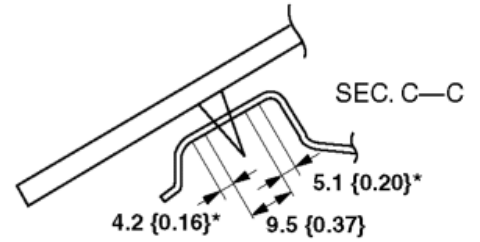
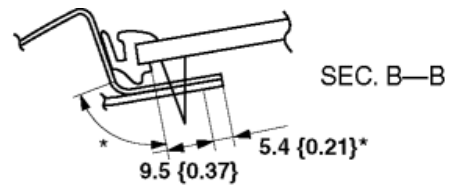
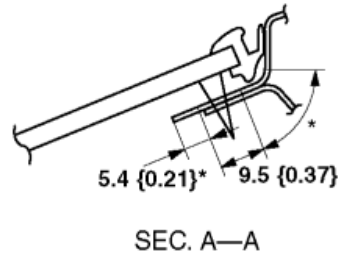
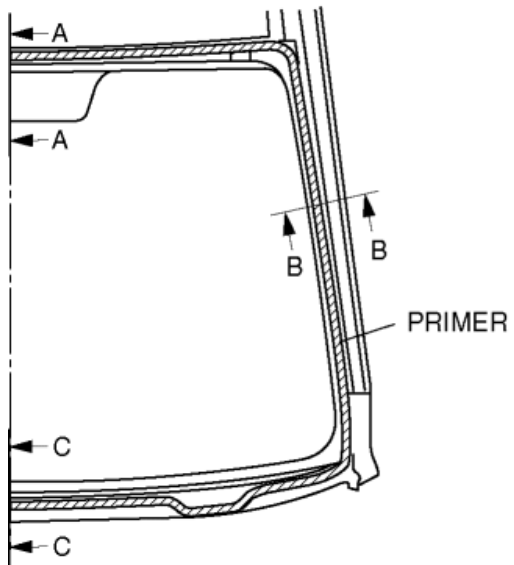
9. Clean and degrease along the perimeter of the bonding area on the body.

10. Apply body primer on the body as shown in the figure, then allow it to dry for **approx. 30 min**.

**CAUTION:**

- To prevent weakening of the primer adhesion, keep the bonding surface free of dirt, moisture, and grease. Do not touch the surface with your hand.

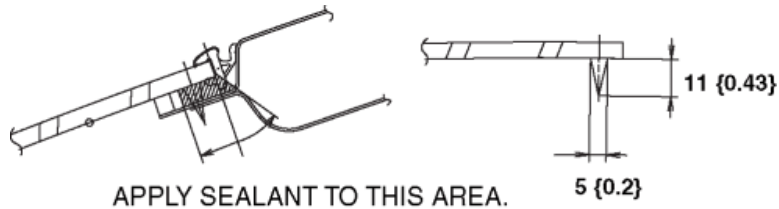




mm {in}

\*: POSSIBLE PRIMER APPLICATION AREA

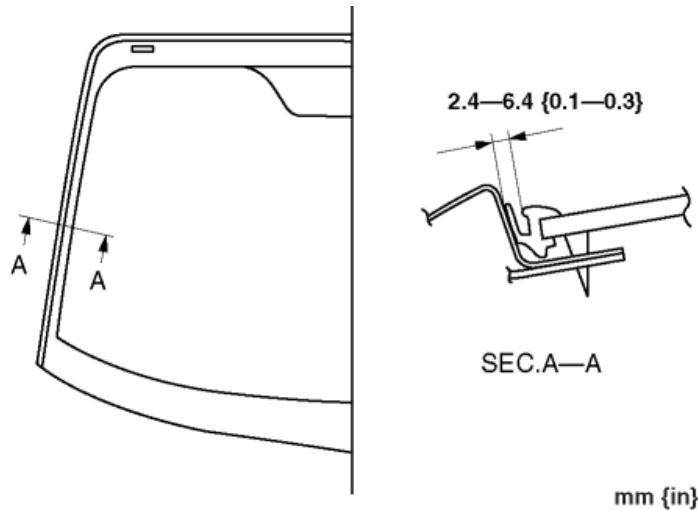
11. Apply sealant to the area of the glass surface as shown in the figure.



mm {in}

12. Insert the windshield locator pins to the body and install the windshield.

13. Verify that the clearance of the A-pillar is within the range shown in the figure, and press along the perimeter of the glass.



mm {in}

14. Install the following parts:

- A-pillar trim (See [A-PILLAR TRIM REMOVAL/INSTALLATION.](#))
- Map light (See [MAP LIGHT REMOVAL/INSTALLATION.](#))
- Front header trim (See [FRONT HEADER TRIM REMOVAL/INSTALLATION.](#))
- Rearview mirror (See [REARVIEW MIRROR REMOVAL/INSTALLATION.](#))
- Windshield garnish (See [WINDSHIELD GARNISH INSTALLATION.](#))
- Cowl grille (See [COWL GRILLE REMOVAL/INSTALLATION.](#))

g. Side cowl grille (See [SIDE COWL GRILLE REMOVAL/INSTALLATION.](#))

h. Wiper arm and blade (See [WIPER ARM AND BLADE REMOVAL/INSTALLATION.](#))

15. Allow the sealant to harden completely. Sealant hardening time: 24 h

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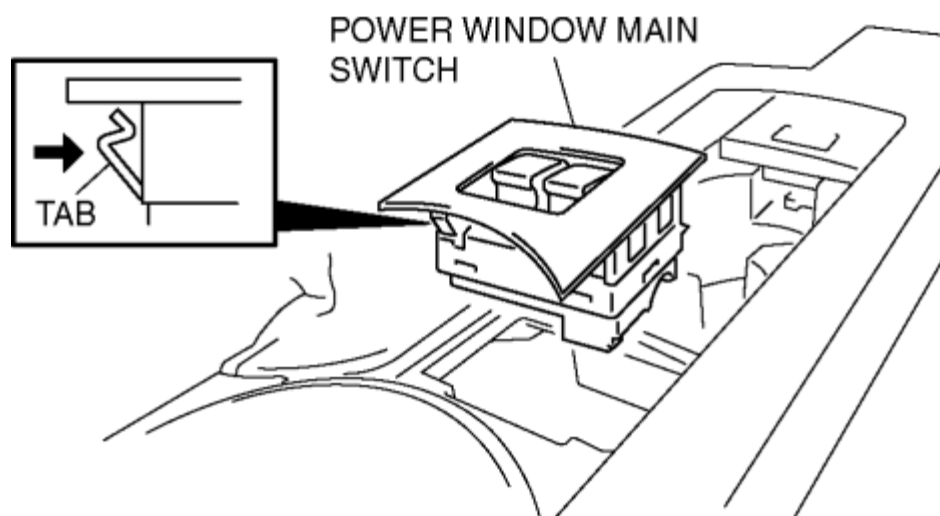
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## 2008 - MX-5 - Body and Accessories

### POWER WINDOW MAIN SWITCH REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the console. (See [CONSOLE REMOVAL/INSTALLATION](#).)
4. Depress the tab and remove the power window main switch.



5. Install in the reverse order of removal.

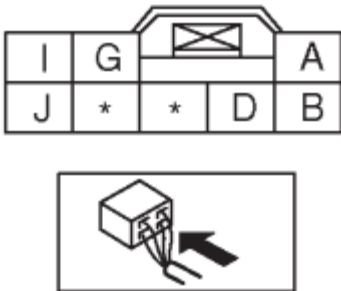
2008 - MX-5 - Body and Accessories

POWER WINDOW MAIN SWITCH INSPECTION

Driver's Side

1. Measure the voltage at each terminal.
- 
- 
- 

POWER WINDOW MAIN SWITCH  
HARNESS-SIDE CONNECTOR

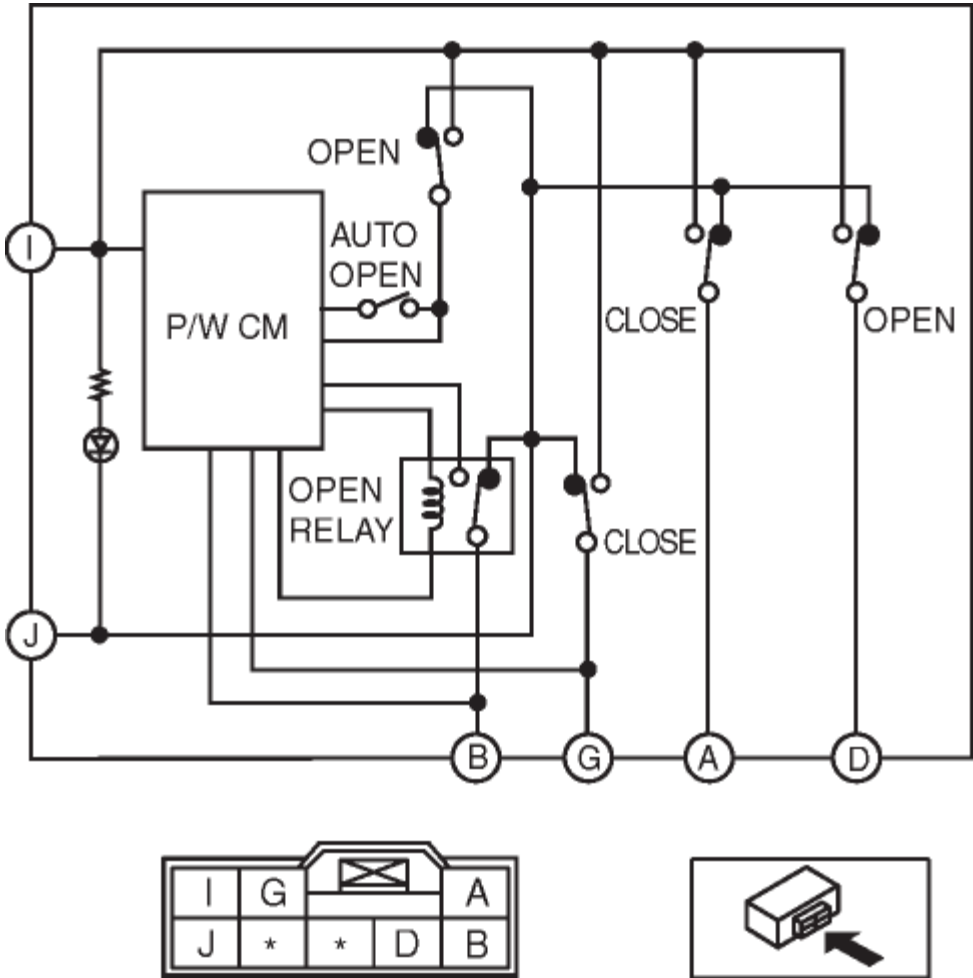


Terminal	Signal name	Connected to	Measured condition	Voltage (V)	Inspection item (s)
B	Open output	Power window motor	While door glass is opening	B+	<div><div></div><div></div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div><div></div><div></div></div>

I	supply	fuse	ON	B+	<ul style="list-style-type: none"> <li>Related wiring harnesses</li> </ul>
J	GND	Body ground	Under any condition	1.0 or less	<ul style="list-style-type: none"> <li>GND</li> </ul>

**Passenger’s Side**

1. Verify that the continuity between the power window main switch terminals is as indicated in the table.



○ — ○ : Continuity

Switch position	Terminal			
	A	D	I	J
Close	○ —	○ —	○ —	○ —
OFF	○ —	○ —	○ —	○ —
Open	○ —	○ —	○ —	○ —

- If not as indicated in the table, replace the power window main switch.

2. Apply battery positive voltage to terminal I, and connect the ground to terminal J, and then verify that the light emitting diode illuminates.

- If not as specified, replace the power window main switch.

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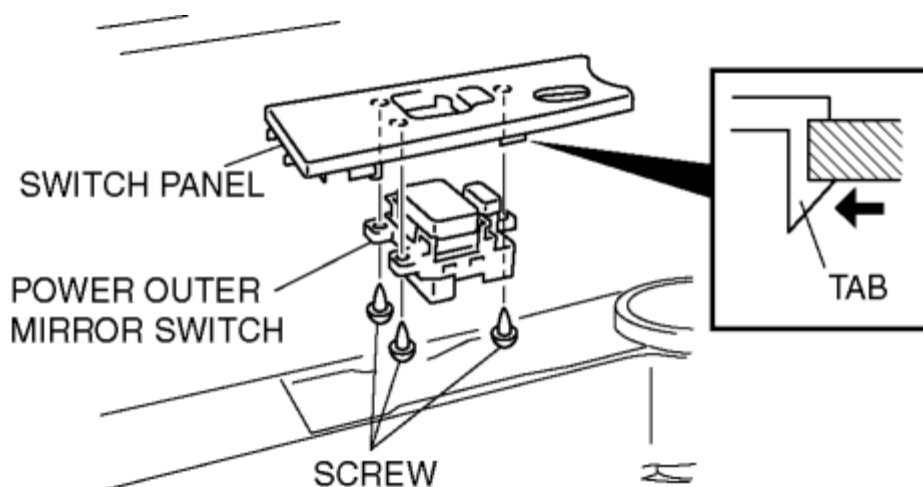
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## 2008 - MX-5 - Body and Accessories

### POWER OUTER MIRROR SWITCH REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the handle pull. (See [DOOR TRIM DISASSEMBLY/ASSEMBLY](#).)
4. Remove the armrest. (See [DOOR TRIM DISASSEMBLY/ASSEMBLY](#).)
5. Remove the door trim. (See [DOOR TRIM REMOVAL/INSTALLATION](#).)
6. Remove the switch panel from the door trim by depressing the tab.

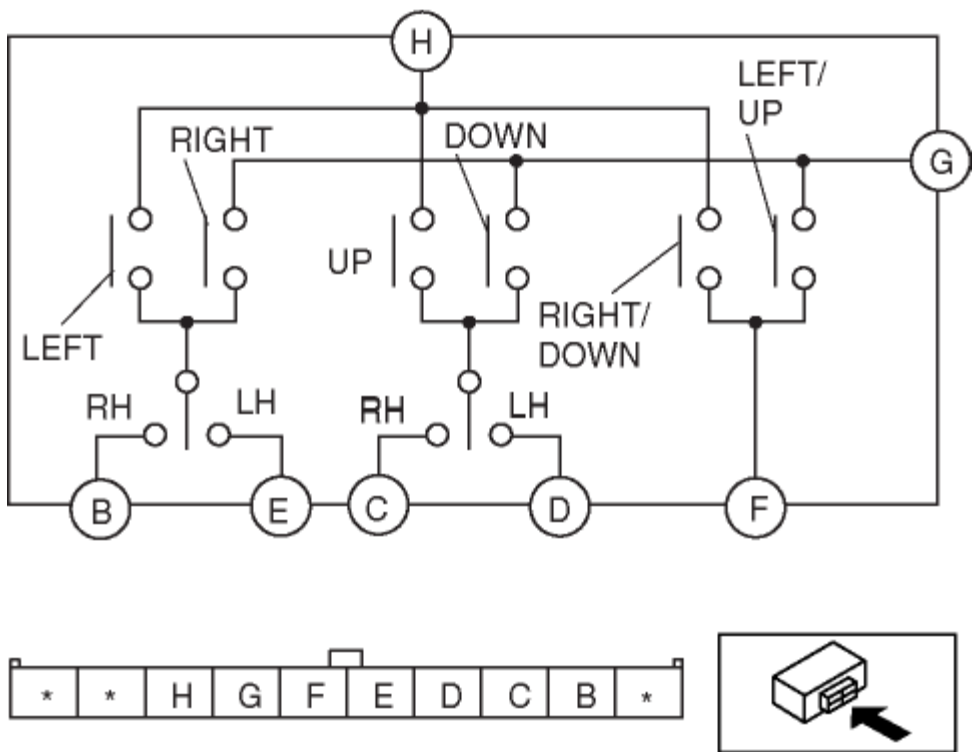


7. Remove the screws and the power outer mirror switch.
8. Install in the reverse order of removal.

2008 - MX-5 - Body and Accessories

POWER OUTER MIRROR SWITCH INSPECTION

- 1. Inspect for continuity between the power outer mirror switch terminals using an ohmmeter.



- If not as specified, replace the power outer mirror switch.

○ — ○ : Continuity

Operation		D	C	E	B	H	G	F
LH	Up	○ — ○				○ — ○	○ — ○	○ — ○
	Down	○ — ○				○ — ○	○ — ○	○ — ○
	Left			○ — ○		○ — ○	○ — ○	○ — ○
	Right			○ — ○		○ — ○	○ — ○	○ — ○
RH	Up		○ — ○			○ — ○	○ — ○	○ — ○
	Down		○ — ○			○ — ○	○ — ○	○ — ○
	Left				○ — ○	○ — ○	○ — ○	○ — ○
	Right				○ — ○	○ — ○	○ — ○	○ — ○



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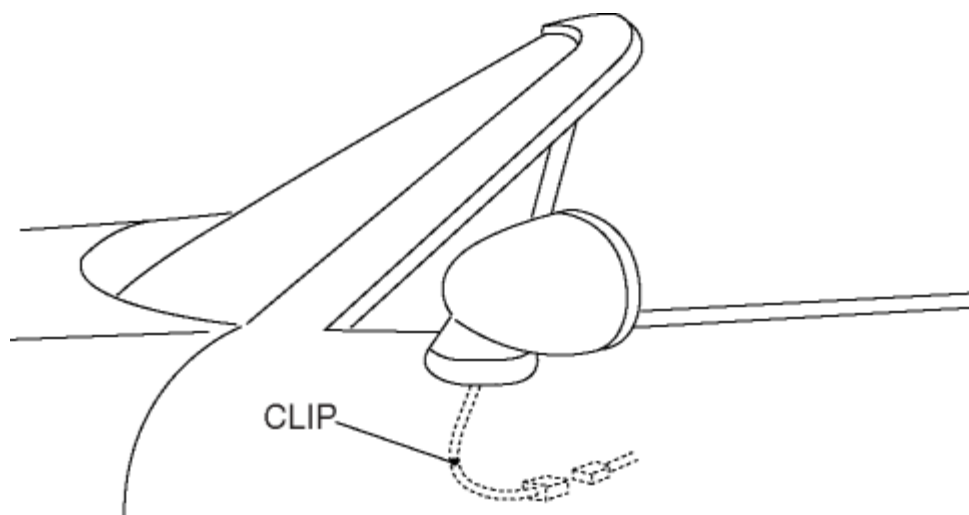
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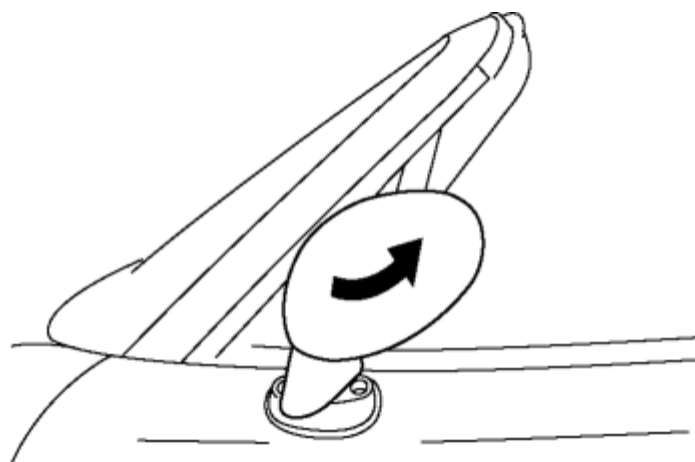
## 2008 - MX-5 - Body and Accessories

### POWER OUTER MIRROR REMOVAL/INSTALLATION

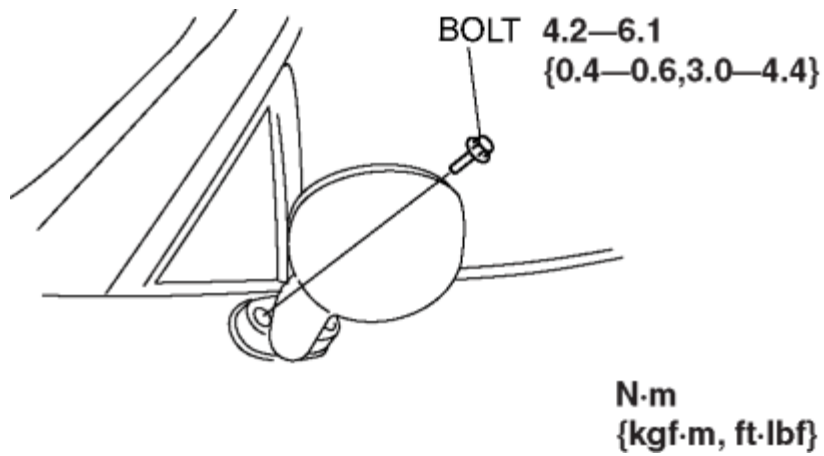
1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the door trim. (See [DOOR TRIM REMOVAL/INSTALLATION](#).)
4. Remove the door speaker. (See [DOOR SPEAKER REMOVAL/INSTALLATION](#).)
5. Remove the door unit. (See [DOOR UNIT REMOVAL/INSTALLATION](#).)
6. Remove clips.



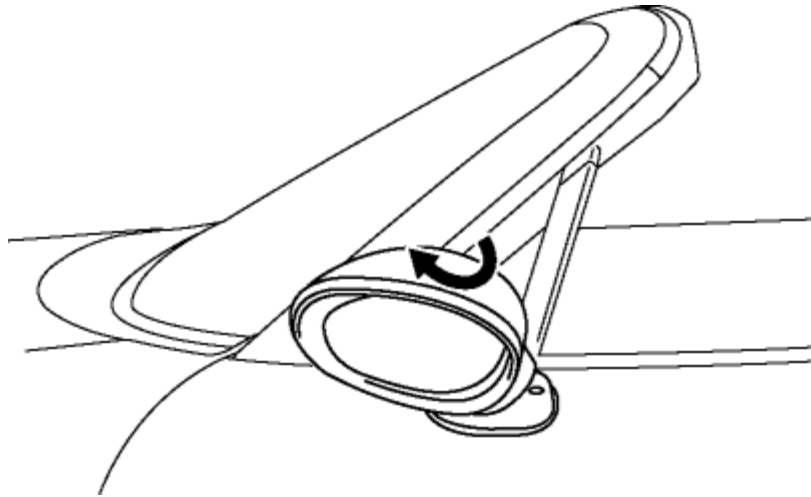
7. Rotate the power outer mirror in the direction shown by the arrow.



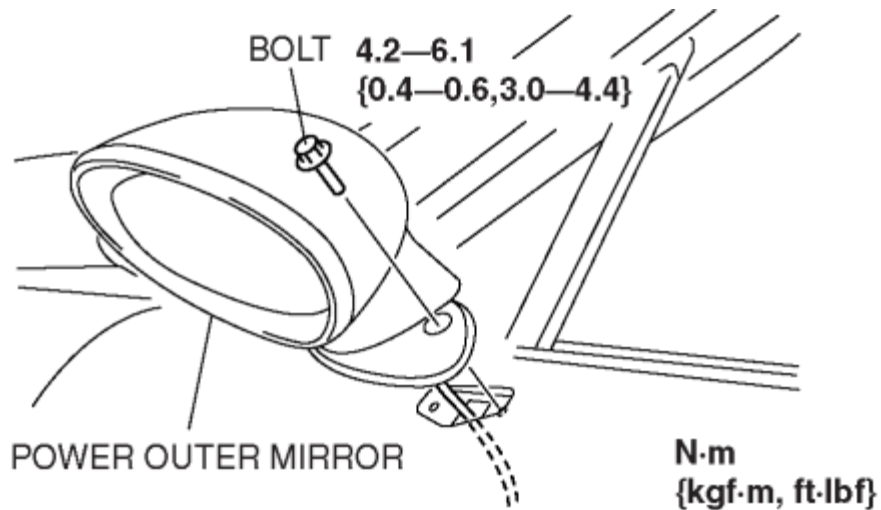
8. Remove the bolt.



9. Rotate the power outer mirror in the direction shown by the arrow.



10. Remove the bolt and the power outer mirror.

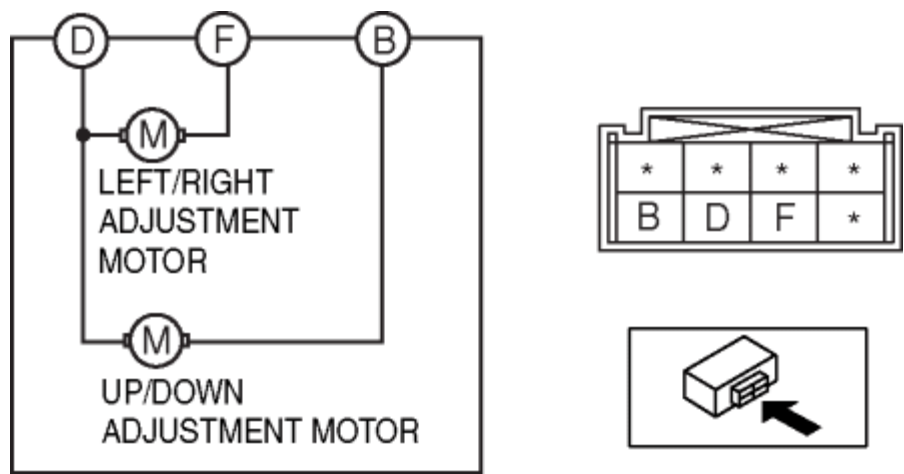


11. Install in the reverse order of removal.

2008 - MX-5 - Body and Accessories

POWER OUTER MIRROR INSPECTION

1. Apply battery positive voltage and connect the ground to the corresponding power outer mirror terminals, and then inspect the operation of the power outer mirror.



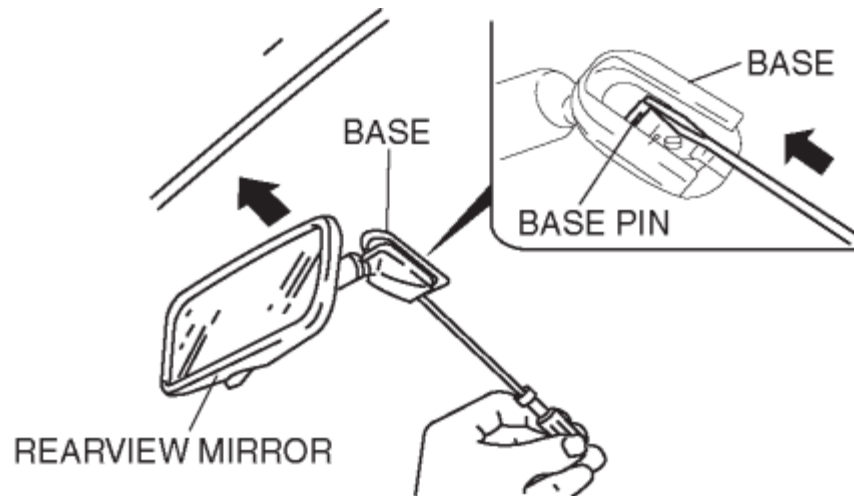
- If not as specified, replace the power outer mirror.

Operation	Terminal	
	B+	GND
Up	B	D
Down	D	B
Left	F	D
Right	D	F

## 2008 - MX-5 - Body and Accessories

### REARVIEW MIRROR REMOVAL/INSTALLATION

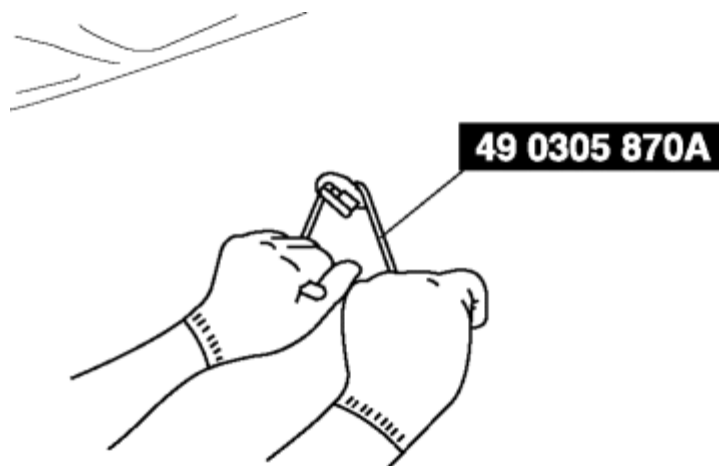
1. Insert a flathead screwdriver between the rearview mirror and base.
2. Press the base pin downward and remove the rearview mirror.



## 2008 - MX-5 - Body and Accessories

### BASE REMOVAL

1. Remove the rearview mirror.
2. Wind each end of a wire around a bar.



#### WARNING:

- Using the SST (piano wire) with bare hands can cause injury. Always wear gloves when using the SST (piano wire).

#### NOTE:

- Use a long sawing action to spread the work over the whole length of the **SST** (piano wire) to prevent it from breaking. Do not pull too hard to prevent damage to windshield.

3. Saw through the sealant to remove the base.

## 2008 - MX-5 - Body and Accessories

### BASE INSTALLATION

1. Cut away all of the original sealant using a razor.

#### WARNING:

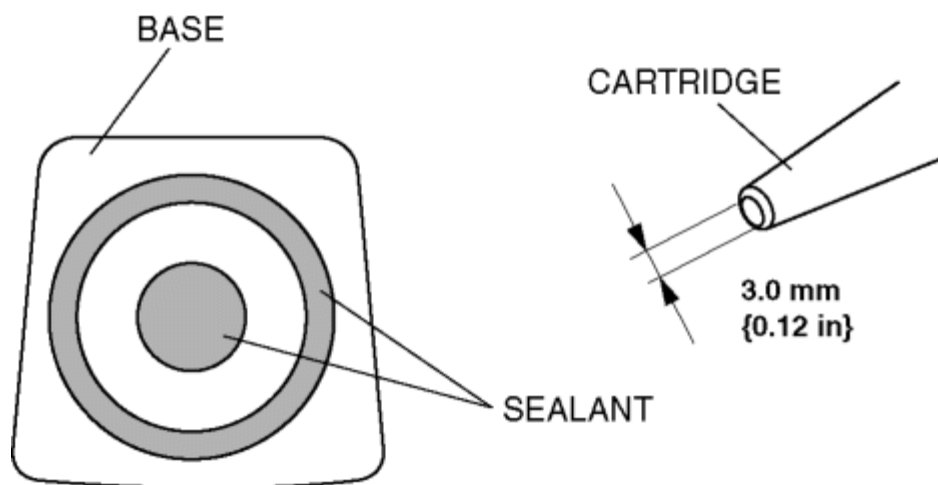
- Using a razor with bare hands can cause injury. Always wear gloves when using a razor.

2. Clean and degrease the ceramic coating on the glass and the base.

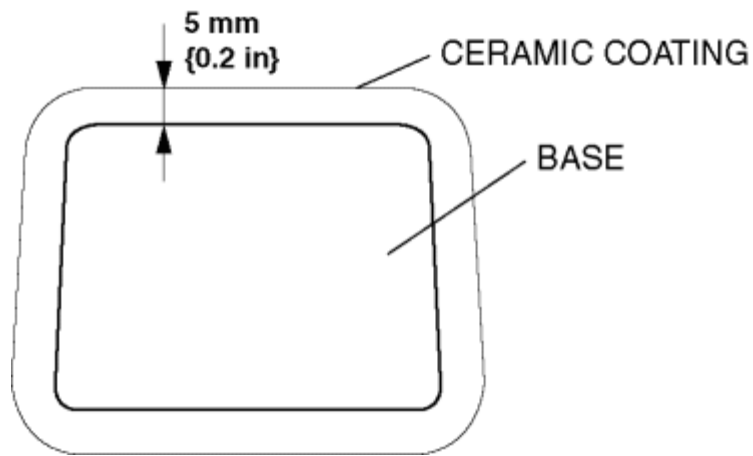
#### CAUTION:

- Keep the area free of dirt and grease, and do not touch the surface. Otherwise, the primer may not properly bond to the surface of the glass.

3. Apply primer to the bonding area of the glass and the base.
4. Use only glass primer on the glass, and body primer on the base. Allow the primer to dry for **approx. 30 min.**
5. Apply **3.0 mm {0.12 in}** layer of sealant to the base.



6. Center the base in the ceramic coating and press it onto the glass.



7. Use isopropyl alcohol to remove any excess repair sealant. **Hardening time of sealant**

Temperature	Surface hardening time	Time required until vehicle can be put into service
5 °C {41 °F}	Approx. 1.5 h	Approx. 12 h
20 °C {68 °F}	Approx. 1 h	Approx. 4 h
35 °C {95 °F}	Approx. 10 min.	Approx. 2 h

8. Install the rearview mirror.

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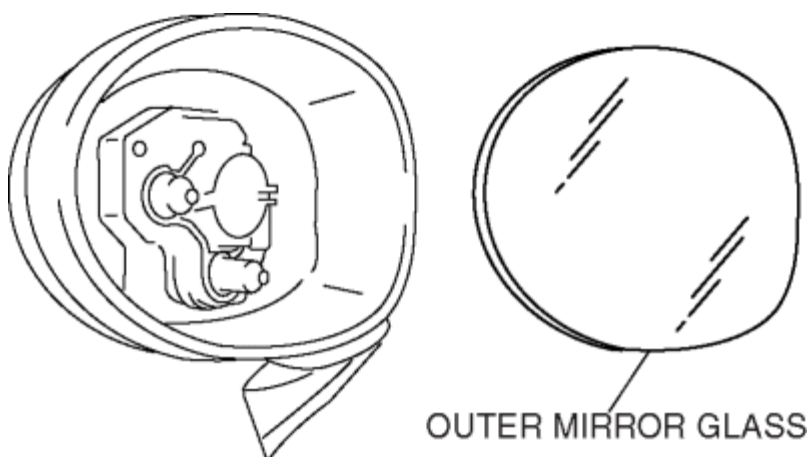
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## 2008 - MX-5 - Body and Accessories

### POWER OUTER MIRROR DISASSEMBLY/ASSEMBLY

1. Remove the outer mirror glass. (See [Outer Mirror Glass Disassembly Note.](#)) (See [Outer Mirror Glass Assembly Note.](#))



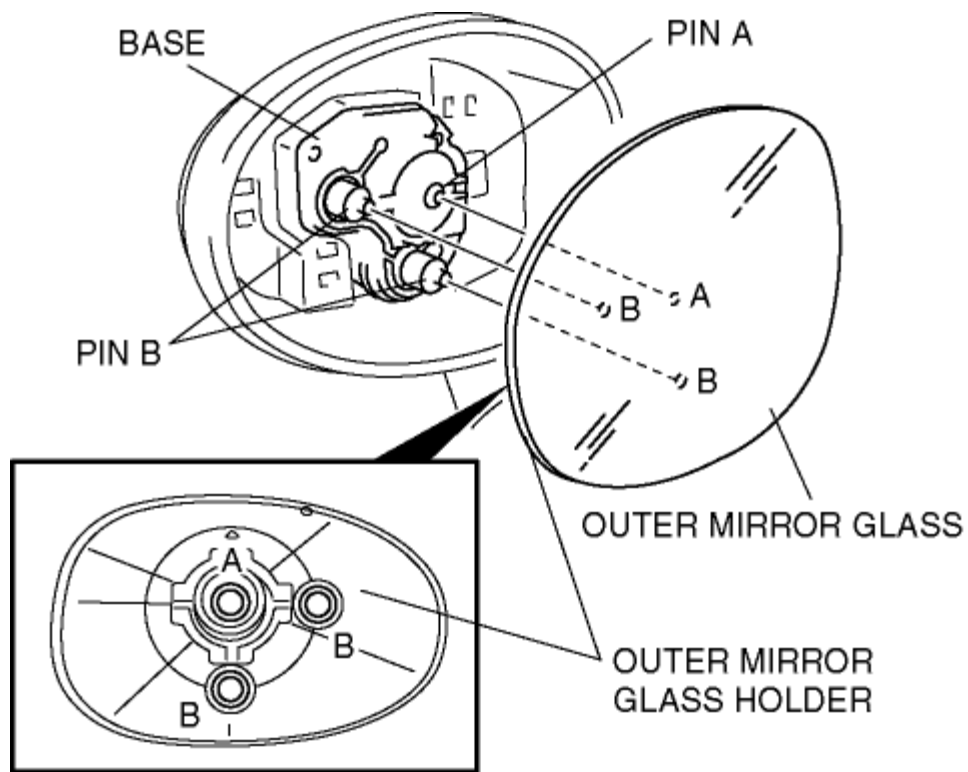
2. Assemble in the reverse order of disassembly.

### Outer Mirror Glass Disassembly Note

1. Press area A of the outer mirror glass so that area B moves outward.



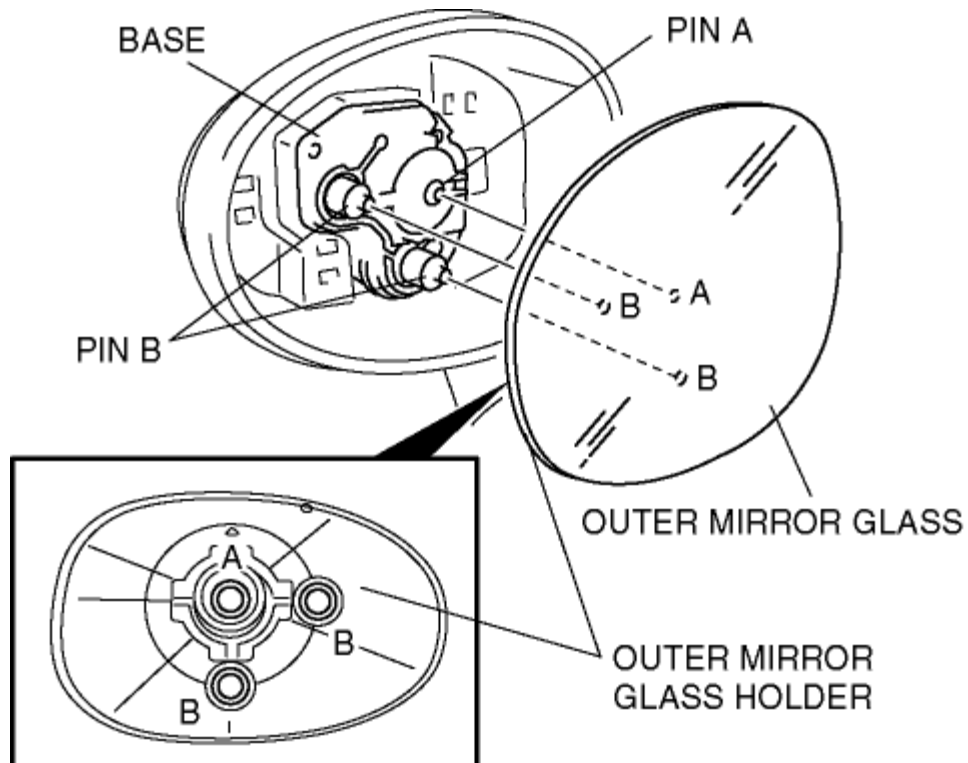
2. Detach pin A while lifting up the inside of the outer mirror glass holder.



3. Pull out the outer mirror glass holder and detach pins B.
4. Remove the outer mirror glass holder and the outer mirror glass as a single unit.

### Outer Mirror Glass Assembly Note

1. Press area A of the mirror glass into the base to attach pin A.



2. Press areas B of the outer mirror glass into the base to attach pins B.

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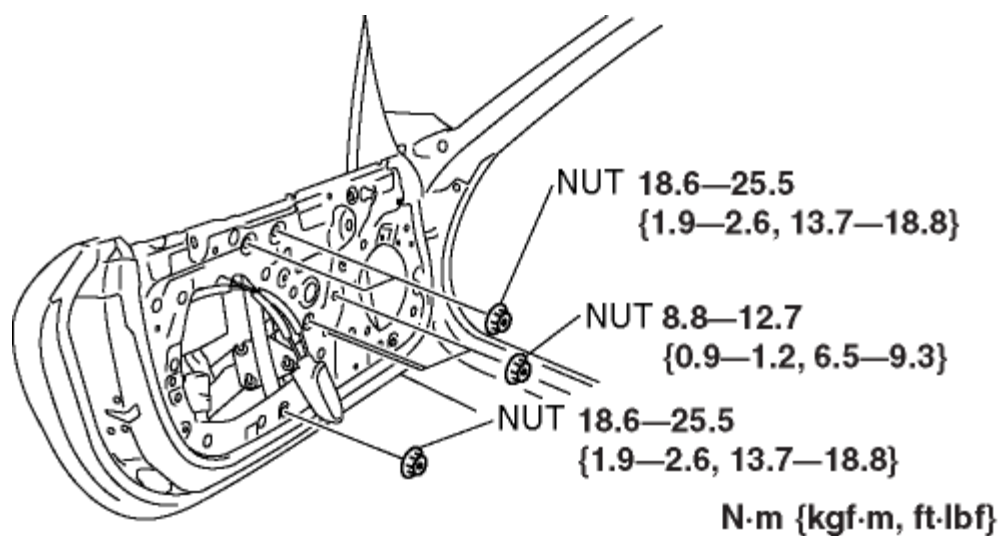
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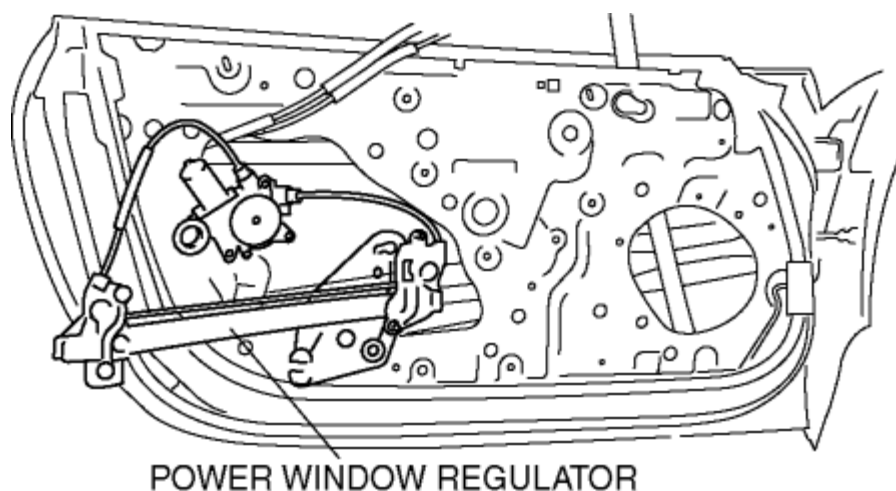
## 2008 - MX-5 - Body and Accessories

### POWER WINDOW REGULATOR REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the door trim. (See [DOOR TRIM REMOVAL/INSTALLATION](#).)
4. Remove the door unit. (See [DOOR UNIT REMOVAL/INSTALLATION](#).)
5. Remove the door glass. (See [DOOR GLASS REMOVAL/INSTALLATION](#).)
6. Remove the nuts.



7. Remove the power window regulator.



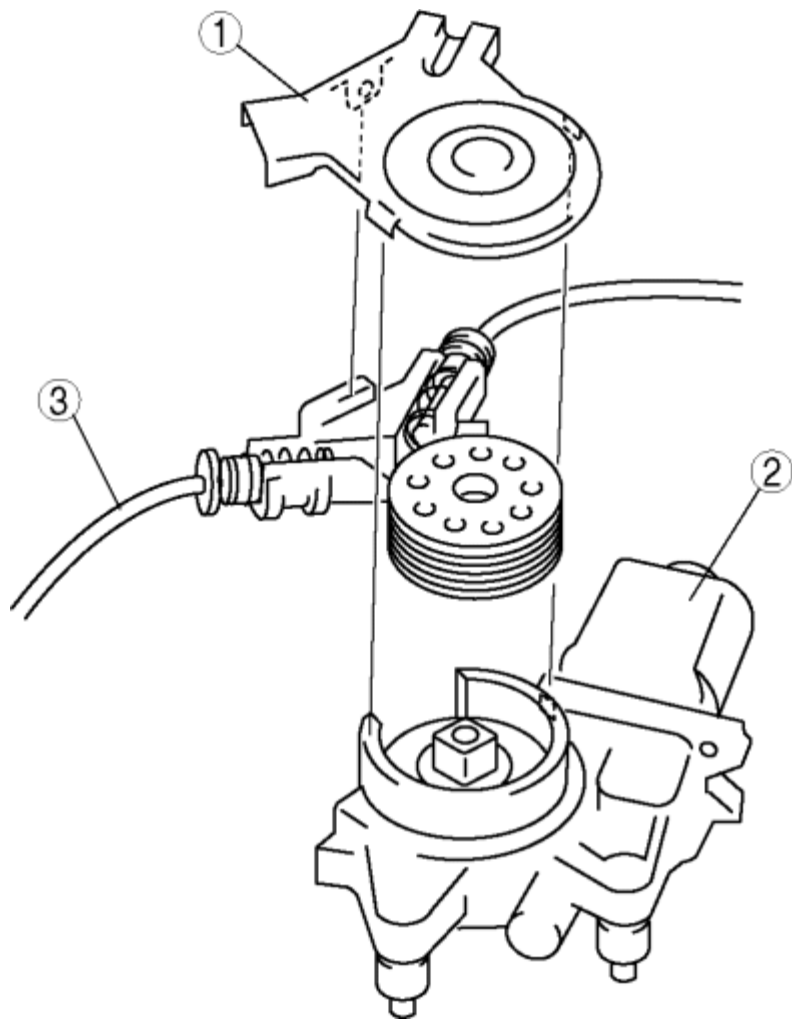
8. Install in the reverse order of removal.



2008 - MX-5 - Body and Accessories

POWER WINDOW REGULATOR DISASSEMBLY/ASSEMBLY

1. Remove in the order indicated in the table.



1	Cover (See <a href="#">Cover Disassembly Note.</a> )
2	Power window motor
3	Frame

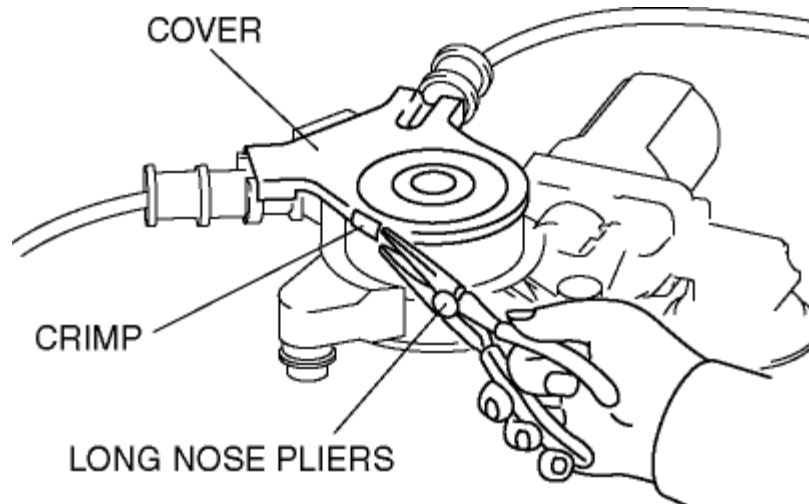
2. Assemble in the reverse order of disassembly.

NOTE:

- When installing the power window motor, be careful that the cable does not become unwound from the drum.

### Cover Disassembly Note

1. Carefully bend away the crimp of the cover using long nose pliers.



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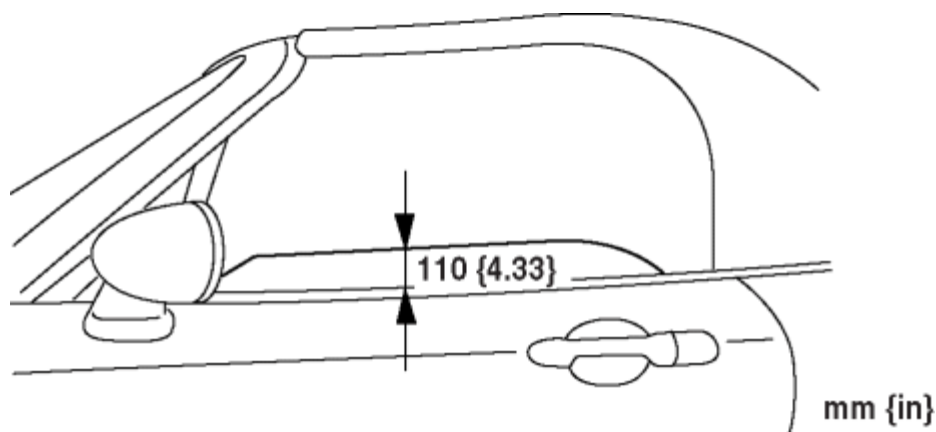
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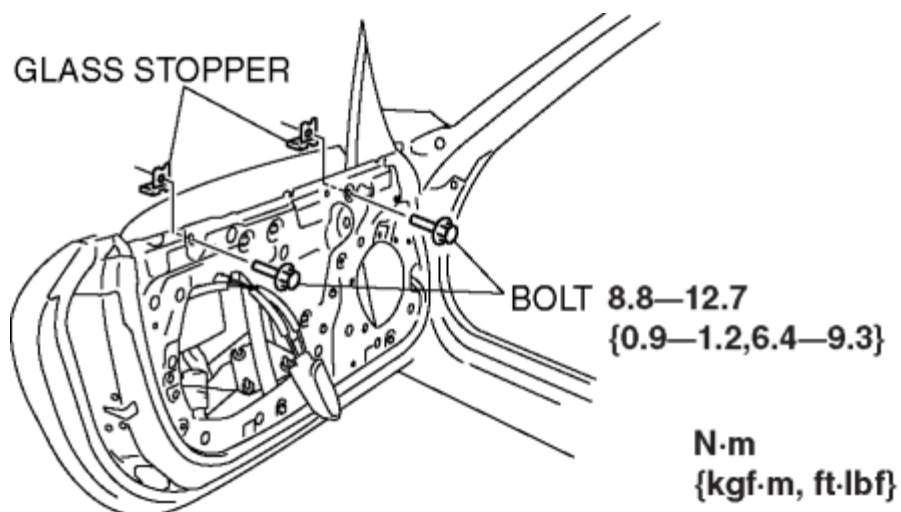
## 2008 - MX-5 - Body and Accessories

### DOOR GLASS REMOVAL/INSTALLATION

1. Position the door glass so that the distance between the top of the front door glass and top of the front beltline molding is **110 mm {4.33 in}**.

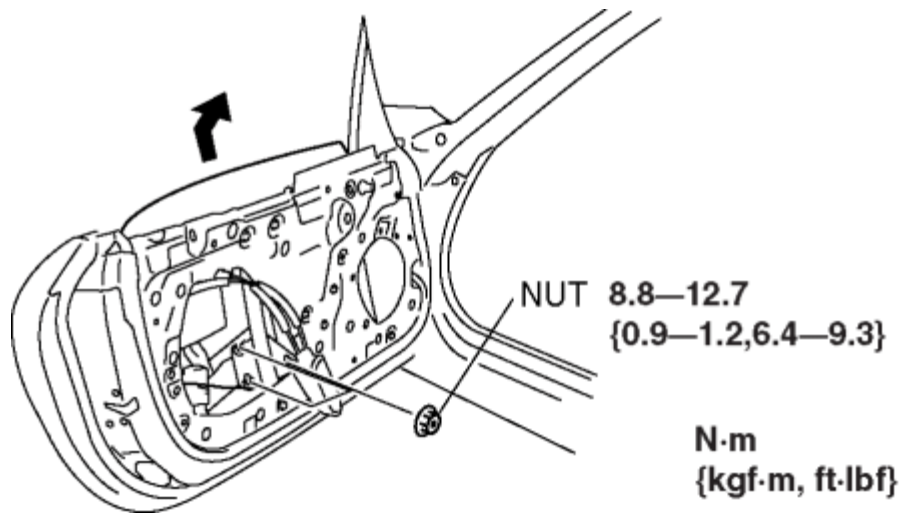


2. Remove the battery cover.
3. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
4. Remove the door trim. (See [DOOR TRIM REMOVAL/INSTALLATION](#).)
5. Remove the door unit. (See [DOOR UNIT REMOVAL/INSTALLATION](#).)
6. Remove the glass stopper.



7. Remove the nuts attaching door glass to regulator.





8. Lift the door glass up, then remove it while tilting it in the direction of the arrow.

9. Install in the reverse order of removal.

10. Adjust the door glass.(See [DOOR GLASS ADJUSTMENT.](#))

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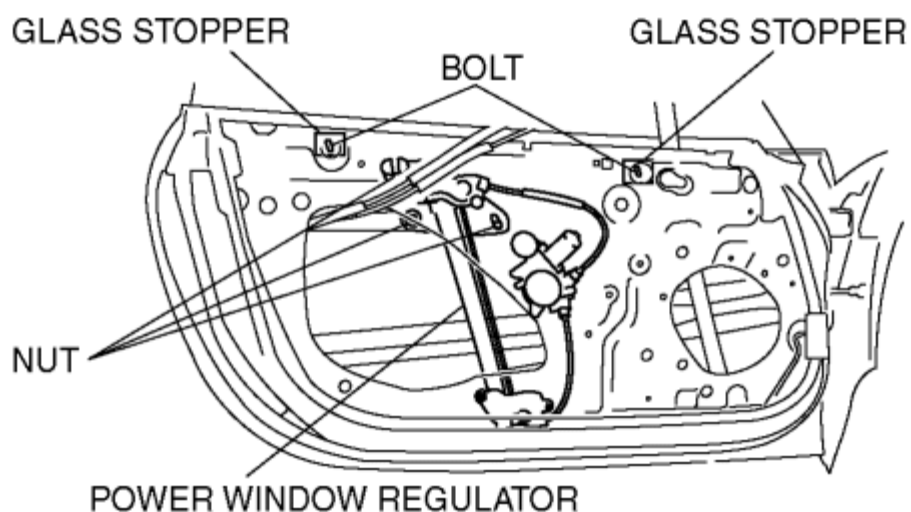
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## 2008 - MX-5 - Body and Accessories

### DOOR GLASS ADJUSTMENT

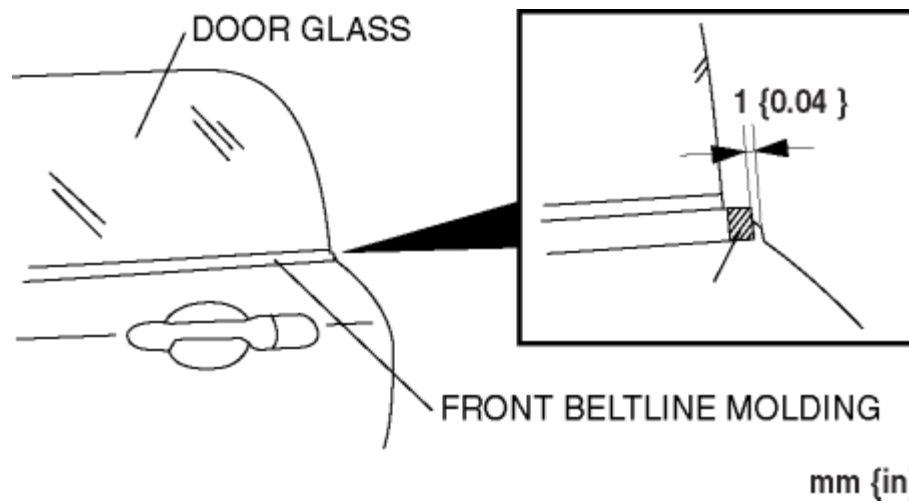
1. Fully close the door glass.
2. Remove the door trim. (See [DOOR TRIM REMOVAL/INSTALLATION.](#))
3. Remove the door unit. (See [DOOR UNIT REMOVAL/INSTALLATION.](#))
4. Connect the power window regulator connector.
5. Loosen the glass stopper installation bolts.



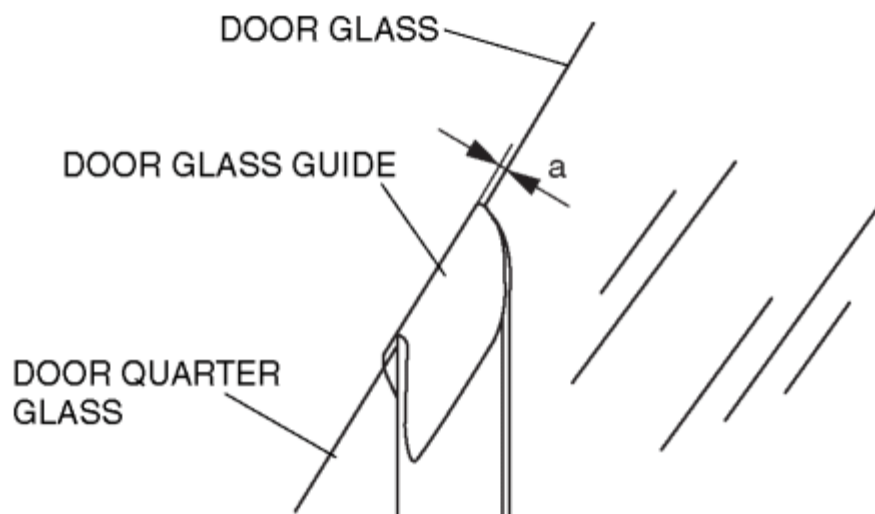
6. Loosen the power window regulator and door glass tightening nuts.
7. Align the door glass with the rear edge of the front beltline molding.

#### NOTE:

- The standard position for the rear edge of the front beltline molding is 1 mm {0.04 in} from the rear edge of the door panel. If the standard position for the rear edge of the front beltline molding has deviated, align the rear edge of the door glass to the standard position for the rear edge position of the front beltline molding.

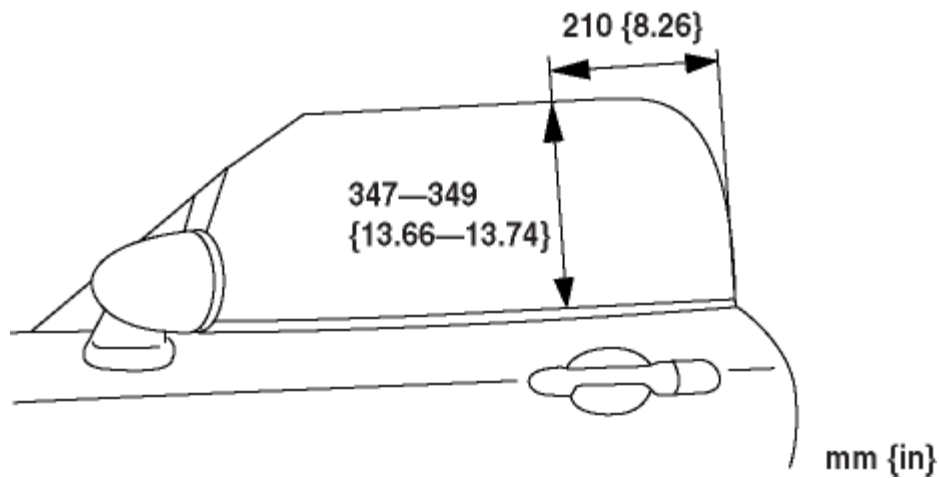


8. Lightly tighten the power window regulator and door glass tightening nuts.
9. Adjust the clearance between the upper edge of the door glass and the door glass guide.

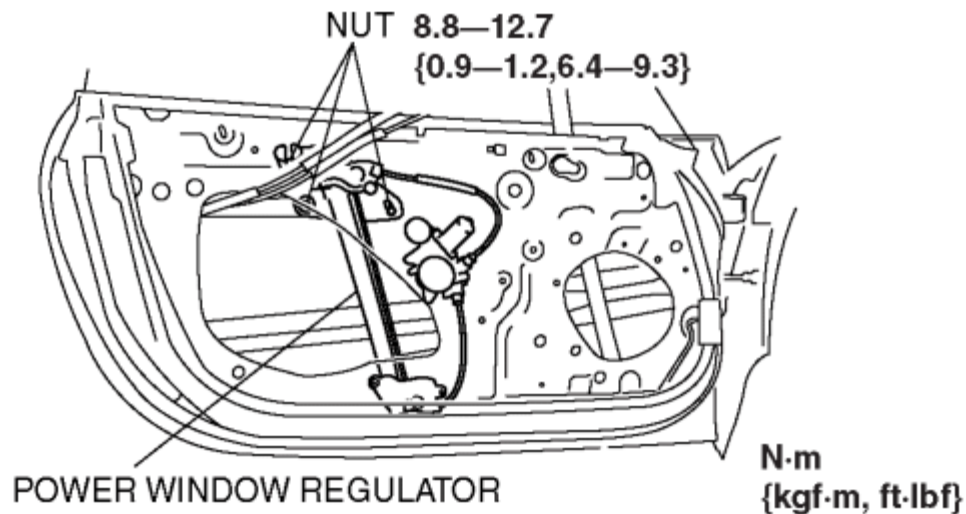


Clearance	Standard	Minimum	Maximum
a	1.0 mm {0.04 in}	0 mm {0 in}	1.5 mm {0.06 in}

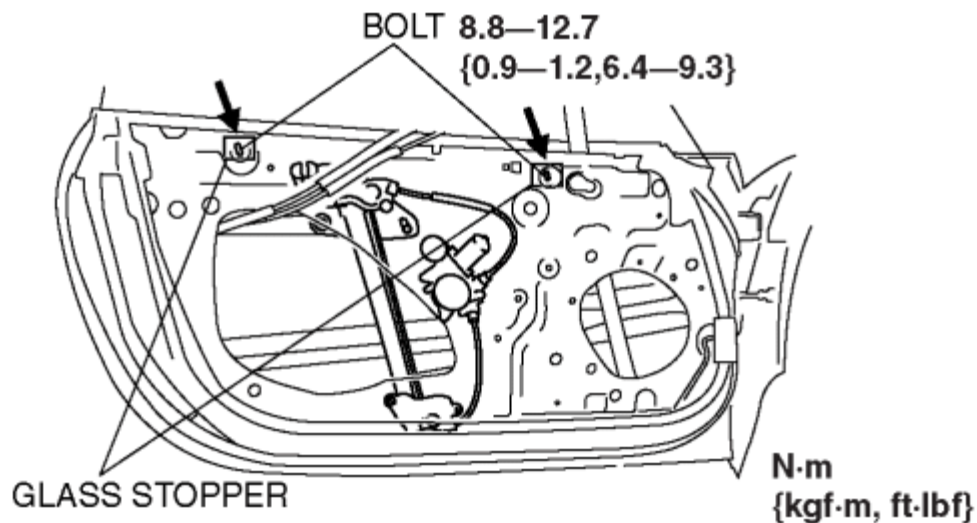
10. Adjust the door glass position.



11. Tighten the power window regulator and door glass tightening nuts.



12. Tighten the bolts while pressing the glass stopper in the direction of the arrows.



13. Verify that the door glass opens and closes smoothly.

14. Install the door unit. (See [DOOR UNIT REMOVAL/INSTALLATION](#).)

15. Install the door trim. (See [DOOR TRIM REMOVAL/INSTALLATION](#).)

16. Close the door with the convertible top, detachable hardtop, or power retractable hardtop closed and verify that the door glass opens and closes smoothly.

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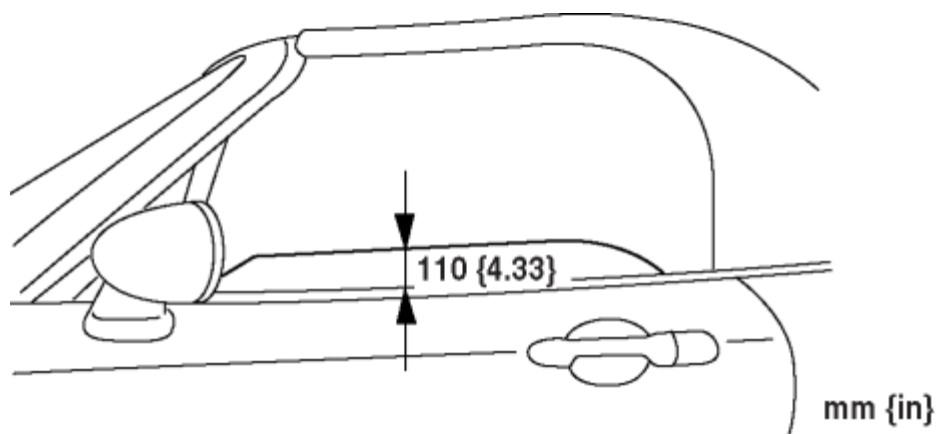
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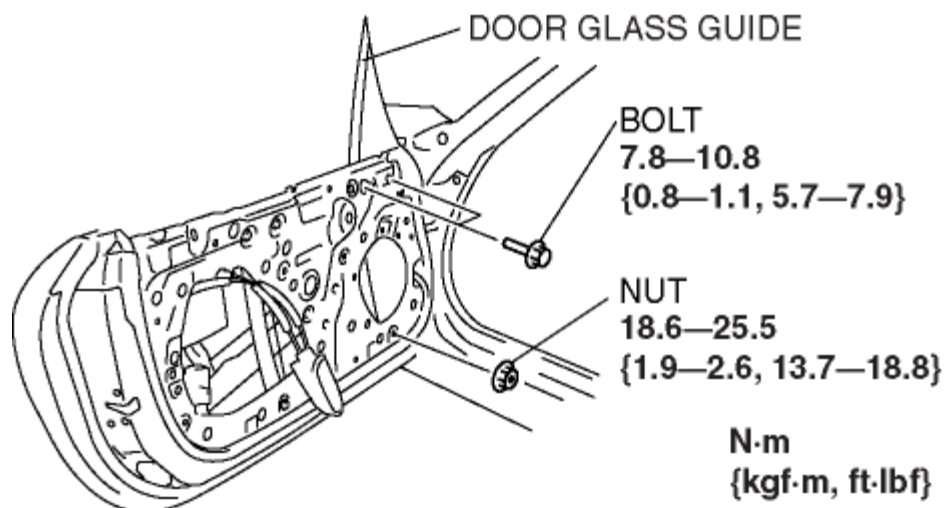
## 2008 - MX-5 - Body and Accessories

### DOOR QUARTER GLASS REMOVAL/INSTALLATION

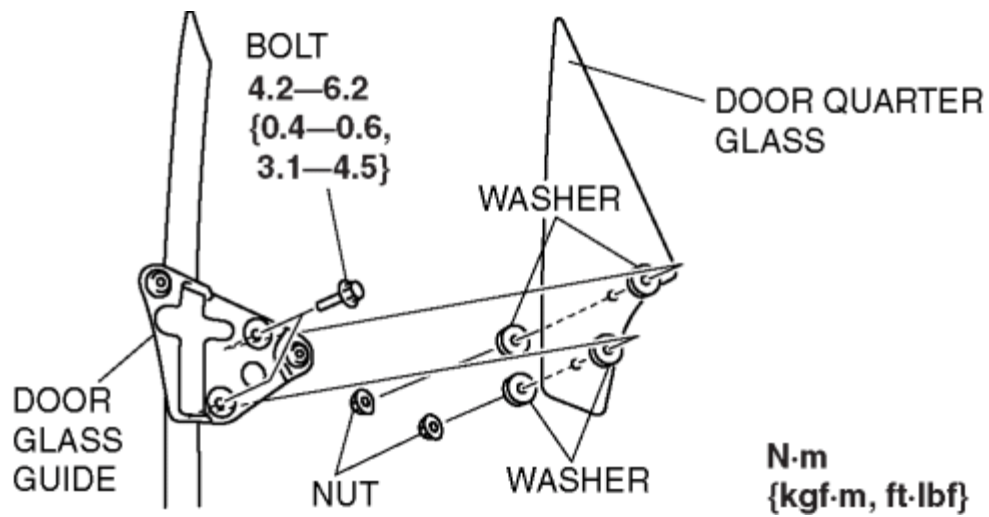
1. Position the door glass so that the distance between the top of the front door glass and top of the front beltline molding is **110 mm {4.33 in}**.



2. Remove the battery cover.
3. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
4. Remove the door trim. (See [DOOR TRIM REMOVAL/INSTALLATION](#).)
5. Remove the door unit. (See [DOOR UNIT REMOVAL/INSTALLATION](#).)
6. Remove the door glass. (See [DOOR GLASS REMOVAL/INSTALLATION](#).)
7. Remove the power window regulator. (See [POWER WINDOW REGULATOR REMOVAL/INSTALLATION](#).)
8. Remove the nut and bolt, then remove the door glass guide. (See [Door Glass Guide Installation Note](#).)



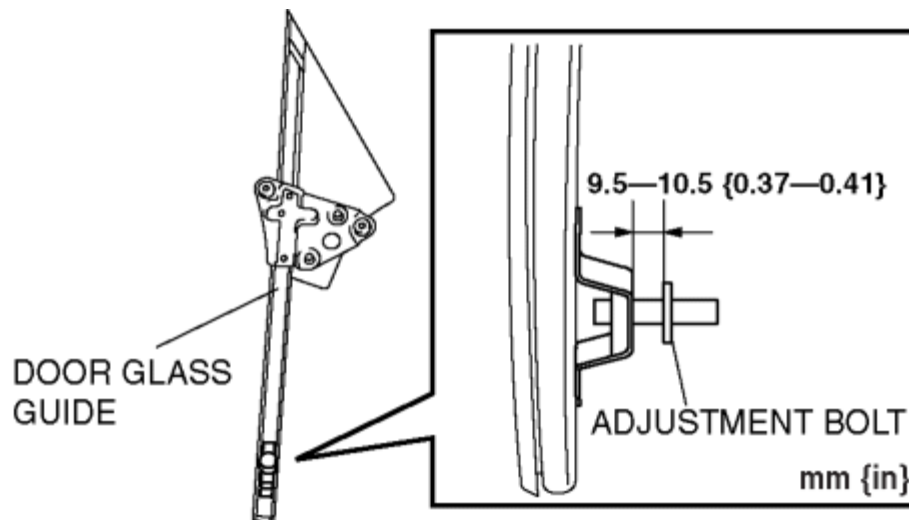
9. Remove the nuts, then remove the door quarter glass.



10. Install in the reverse order of removal.

### Door Glass Guide Installation Note

1. Adjust the adjustment bolt as shown in the figure.



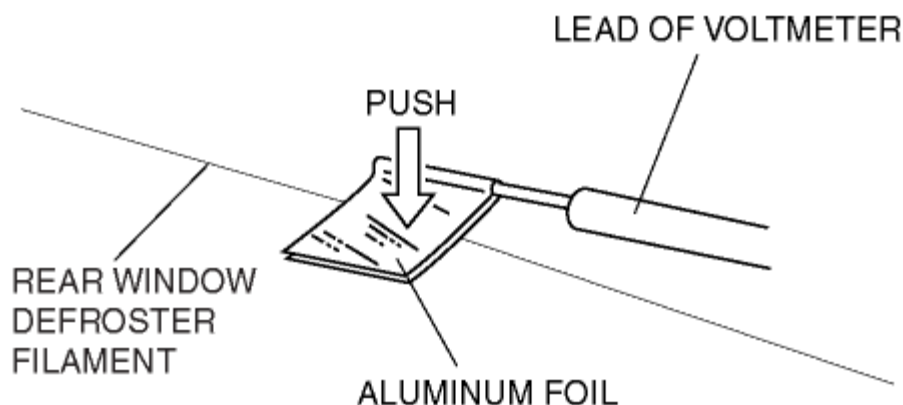
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## 2008 - MX-5 - Body and Accessories

### REAR WINDOW DEFROSTER FILAMENT INSPECTION

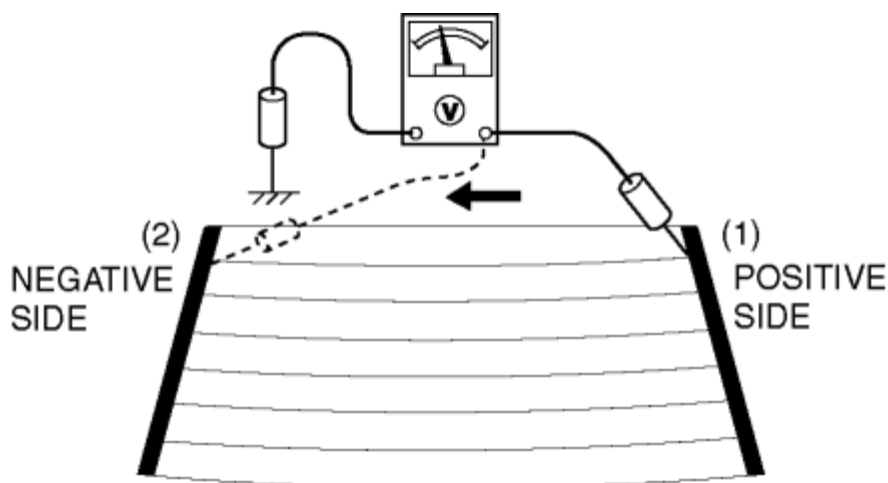
1. Turn the ignition switch to the ON position.
2. Turn the rear window defroster switch on.



#### CAUTION:

- Directly touching the rear window defroster filament with the lead of the voltmeter could damage it. Wrap aluminum foil around the end of the lead and test the rear window defroster filament by touching it with the foil.

3. Connect the positive lead of the tester to the positive side of each rear window defroster filament and the negative lead to ground.
4. Gradually slide the positive lead from the positive side to the negative side and verify that the voltage decreases accordingly.



- If the voltage changes rapidly, the rear window defroster filament has a malfunction. Repair the rear window defroster filament.



Measured part	Voltage (Reference)
(1) to (2)	Approx. 12 V to 0 V

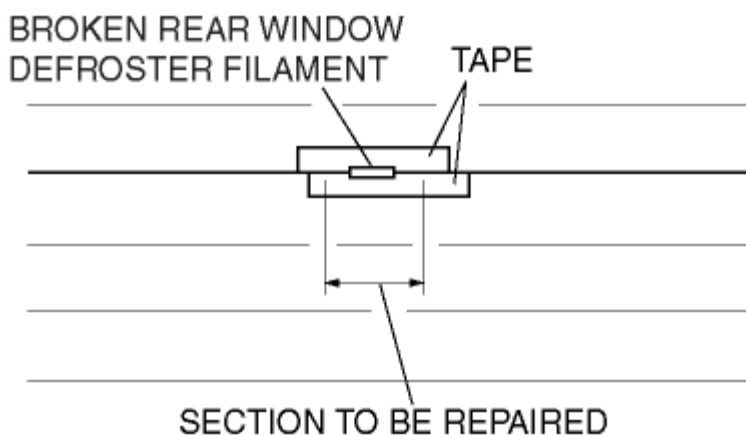
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## 2008 - MX-5 - Body and Accessories

### REAR WINDOW DEFROSTER FILAMENT REPAIR

1. Clean the rear window defroster filament using isopropyl alcohol.
2. Attach tape to both sides of the rear window defroster filament.



3. Using a small brush or marking pen, apply silver paint.
4. After **2—3 min**, carefully remove the tape without damaging the applied area.

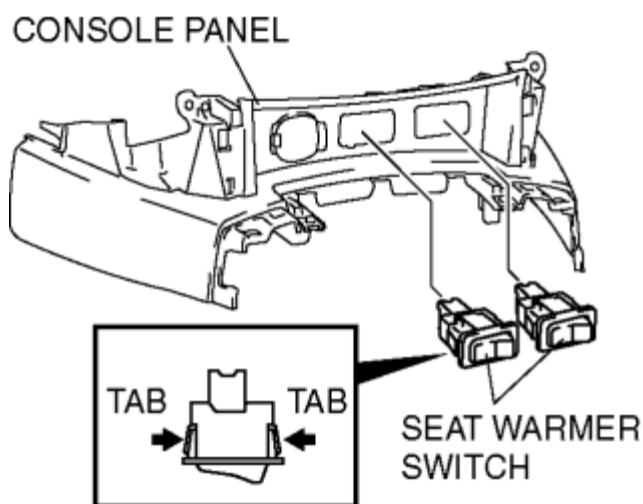
#### CAUTION:

- Do not operate the rear window defroster until the paint is completely dry. It may be cause other malfunctions if it is used before paint is dry.
5. Dry the repaired part using the following procedure.
    - When the room temperature is **25 °C {77 °F}**, leave as it is for **24 h**.
    - When a hot air blower is used, dry with the temperature of **150 °C {302 °F}** for **30 min**.

## 2008 - MX-5 - Body and Accessories

### SEAT WARMER SWITCH REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the console. (See [CONSOLE REMOVAL/INSTALLATION.](#))
4. Remove the side wall. (See [SIDE WALL REMOVAL/INSTALLATION.](#))
5. Remove the console panel. (See [CONSOLE PANEL REMOVAL/INSTALLATION.](#))
6. Squeeze the tabs of seat warmer switch and pull it outward to remove it.



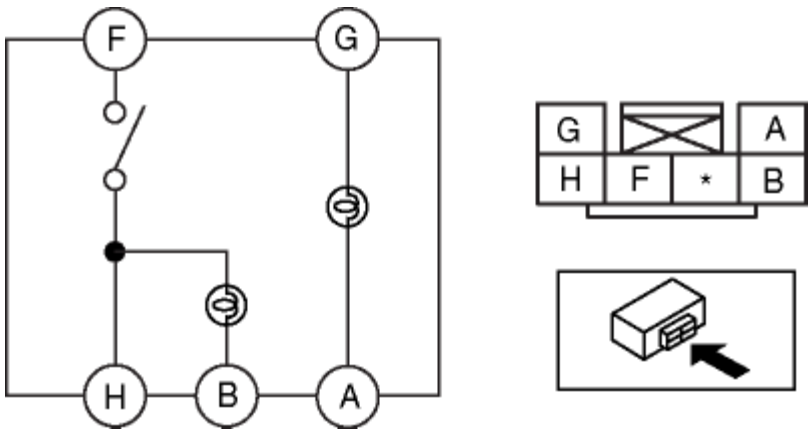
7. Install in the reverse order of removal.

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SEAT WARMER SWITCH INSPECTION

Driver's side

1. Verify that the continuity between the seat warmer switch terminals is as indicated in the table.



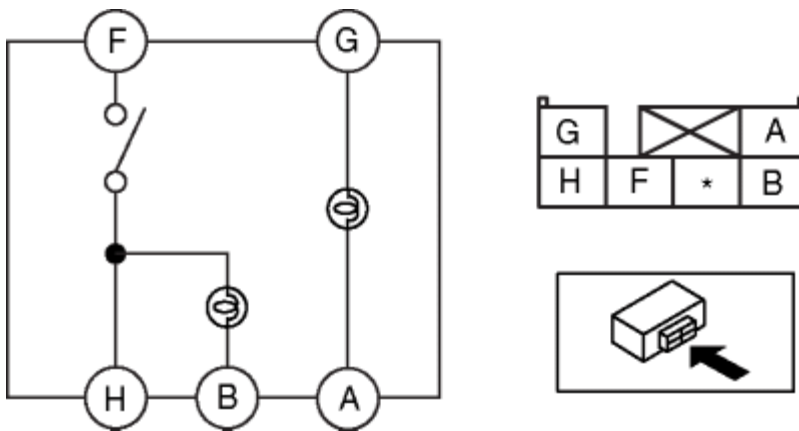
- If not as indicated in the table, replace the seat warmer switch.

○—○ : Continuity   ○⊗○ : Bulb

Switch position	Terminal				
	B	H	F	A	G
ON	○⊗○	○—○	○	○⊗○	○
OFF	○⊗○	○		○⊗○	○

Passenger's side

1. Verify that the continuity between the seat warmer switch terminals is as indicated in the table.



- If not as indicated in the table, replace the seat warmer switch.

○—○: Continuity ○⊕○: Bulb

Switch position	Terminal				
	B	H	F	A	G
ON	○⊕○	○—○	○	○⊕○	○
OFF	○⊕○			○⊕○	○

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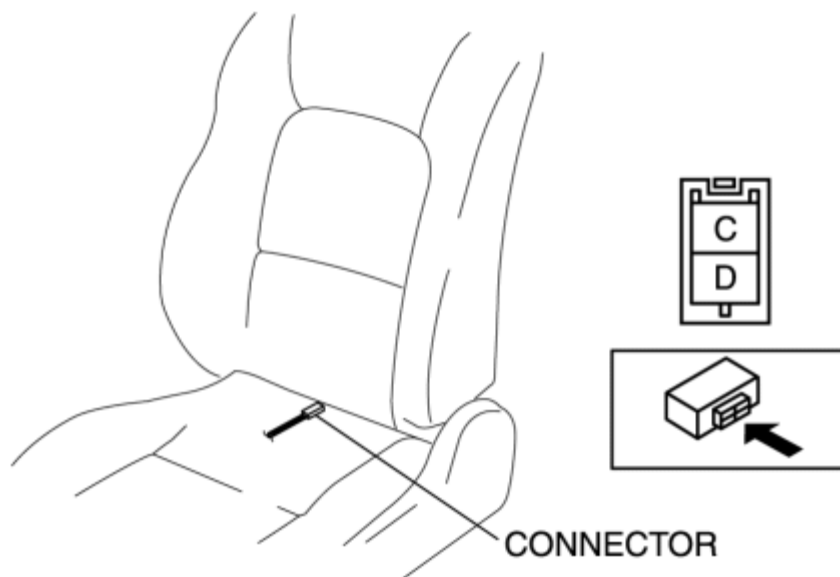
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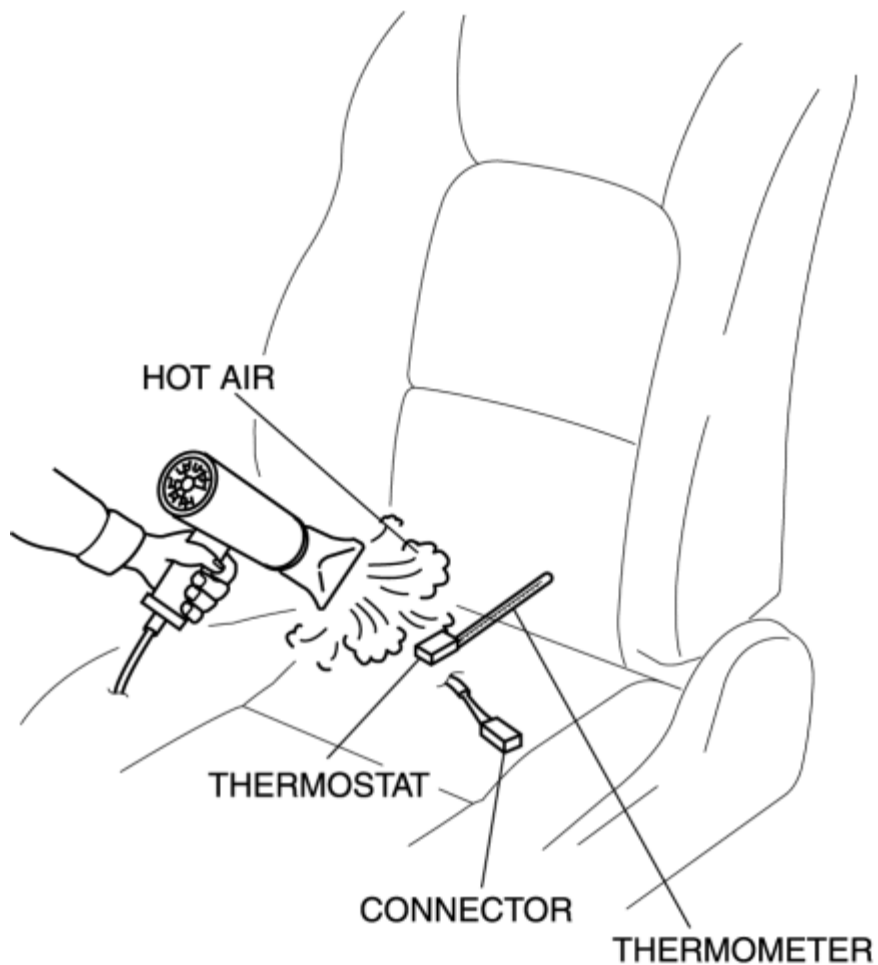
### SEAT WARMER UNIT INSPECTION

#### Seat Cushion

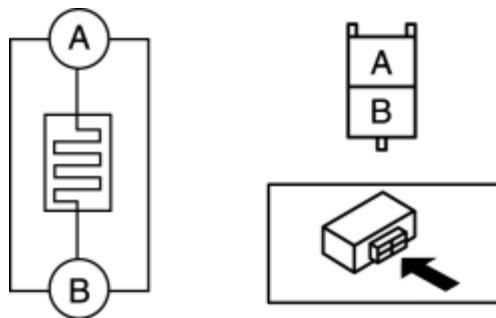
1. Remove the seat. (See [SEAT REMOVAL/INSTALLATION](#).)
2. Remove the seat cushion trim. (See [SEAT DISASSEMBLY/ASSEMBLY](#).)
3. Connect a jumper wire to the connector for the seat cushion warmer to seat back warmer.



4. While inspecting for continuity between the terminals A and B of the connector, use a dryer to warm the thermostat of the seat warmer unit on seat cushion.



5. Verify that the continuity between the seat warmer terminals is as indicated in the table.



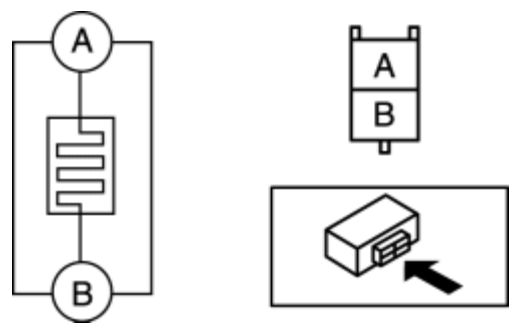
- If not as indicated in the table, replace the seat warmer unit.

○—○ : Continuity

Thermostat temperature	Terminal	
	A	B
More than approx. 37—43 °C {99—109 °F}		
Less than approx. 27—33 °C {81—91 °F}	○—○	○—○

Seat Back

- 1. Remove the seat. (See SEAT REMOVAL/INSTALLATION.)
- 2. Remove the seat back trim. (See SEAT DISASSEMBLY/ASSEMBLY.)
- 3. Verify that the continuity between the seat warmer terminals is as indicated in the table.



- If not as indicated in the table, replace the seat warmer unit.

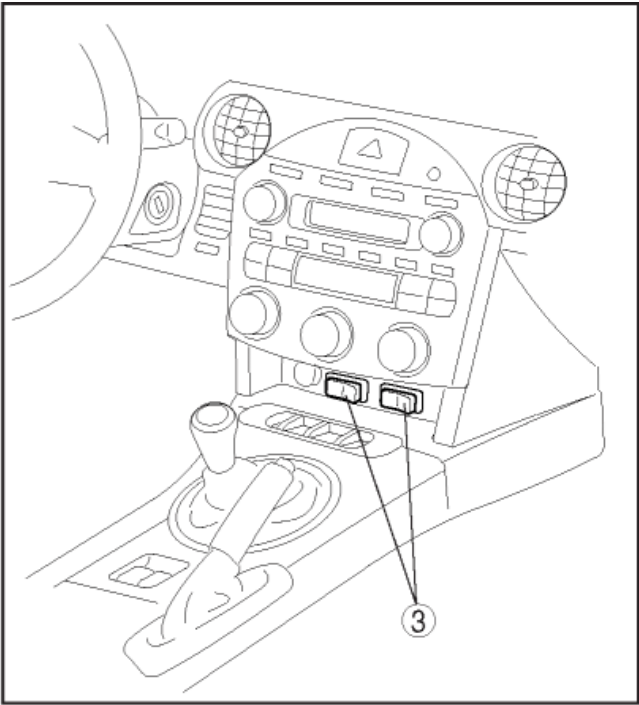
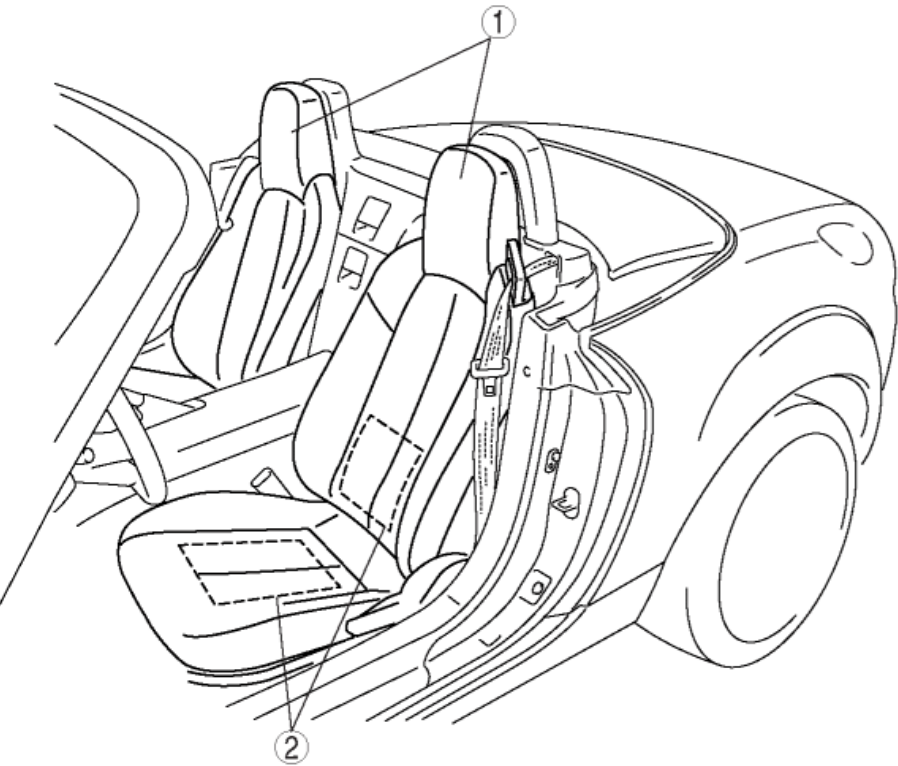
○ — ○ : Continuity

Thermostat temperature	Terminal	
	A	B
Under any condition	○ —	— ○



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SEAT LOCATION INDEX



1	Seat (See <a href="#">SEAT REMOVAL/INSTALLATION.</a> ) (See <a href="#">SEAT DISASSEMBLY/ASSEMBLY.</a> )
2	Seat warmer unit (See <a href="#">SEAT WARMER UNIT INSPECTION.</a> )
3	Seat warmer switch (See <a href="#">SEAT WARMER SWITCH REMOVAL/INSTALLATION.</a> ) (See <a href="#">SEAT WARMER SWITCH INSPECTION.</a> )

## 2008 - MX-5 - Body and Accessories

### SEAT REMOVAL/INSTALLATION

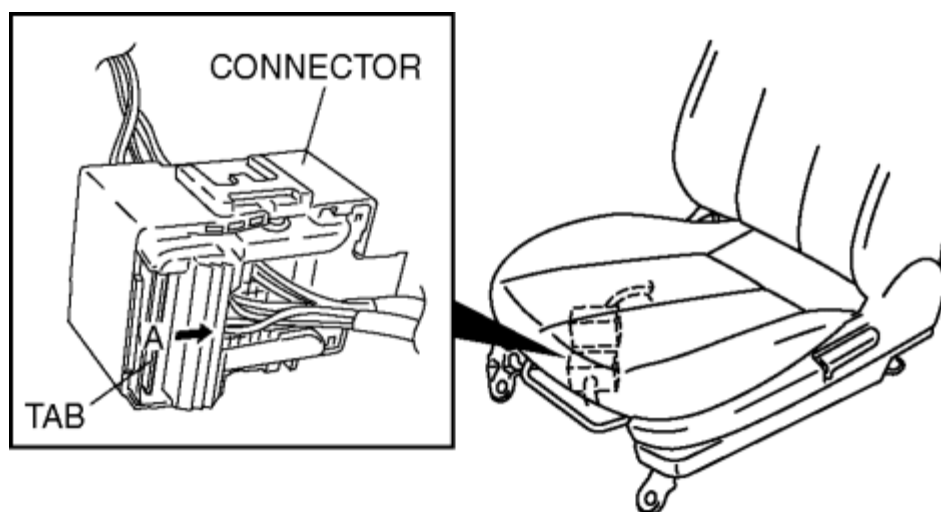
#### WARNING:

- Handling the seat (side air bag) improperly can accidentally deploy the side air bag module, which may seriously injure you. Read the air bag system service warnings and cautions before handling the seat. (See [AIR BAG SYSTEM SERVICE WARNINGS](#).) (See [AIR BAG SYSTEM SERVICE CAUTIONS](#).)

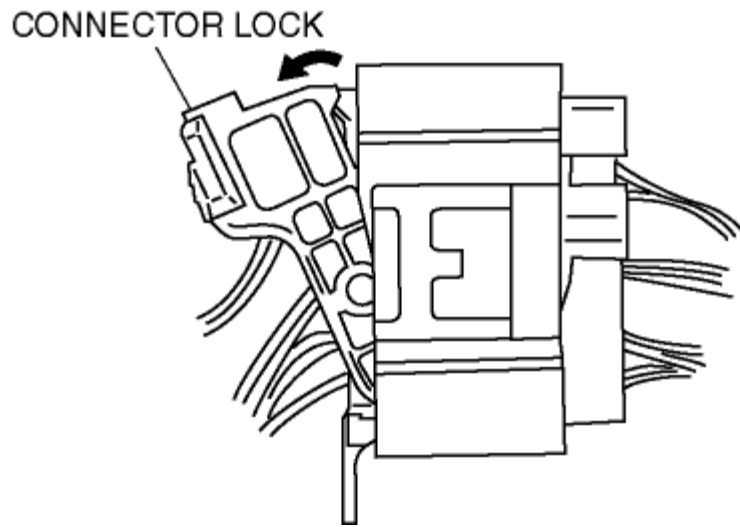
#### CAUTION:

- When the passenger's seat is removed, perform the seat weight sensor inspection using the M-MDS after installing the passenger's seat. (See [SEAT WEIGHT SENSOR INSPECTION](#).)
- When the passenger's seat is replaced with a new one, perform the seat weight sensor calibration using the M-MDS. (See [SEAT WEIGHT SENSOR CALIBRATION](#).)

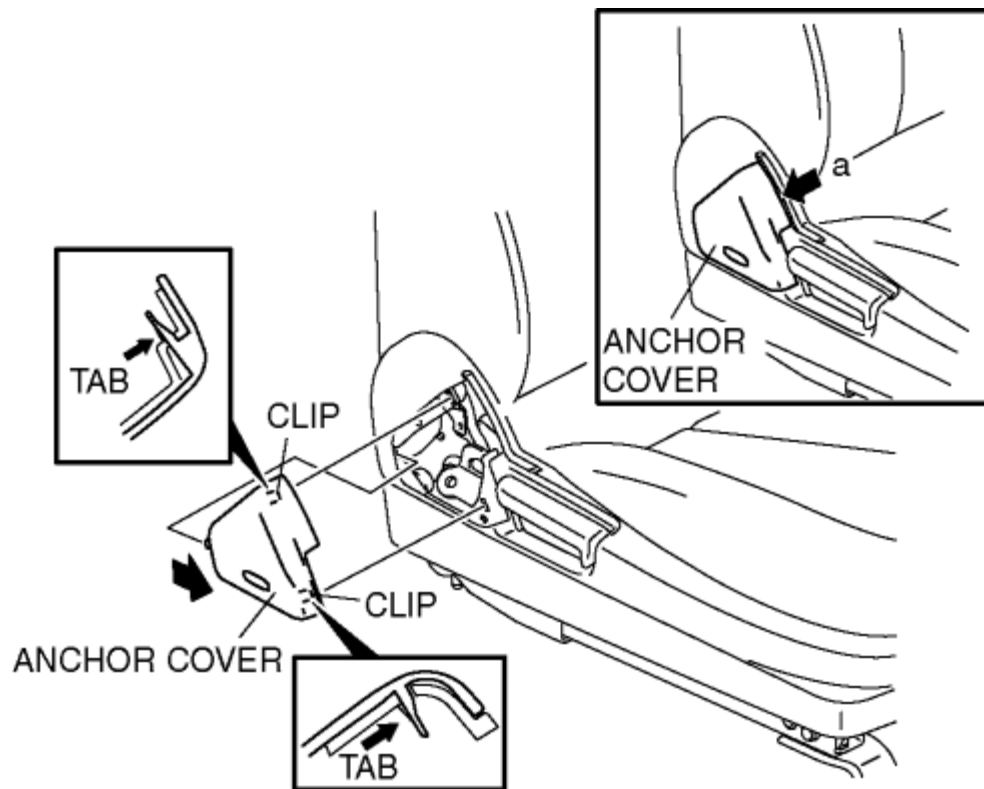
1. Turn the ignition switch to the LOCK position.
2. Remove the battery cover.
3. Disconnect the negative battery cable and wait for **1 min or more**. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
4. Press connector tab A in the direction of the arrow.



5. Pull out the connector lock in the direction of the arrow and disconnect the connector.



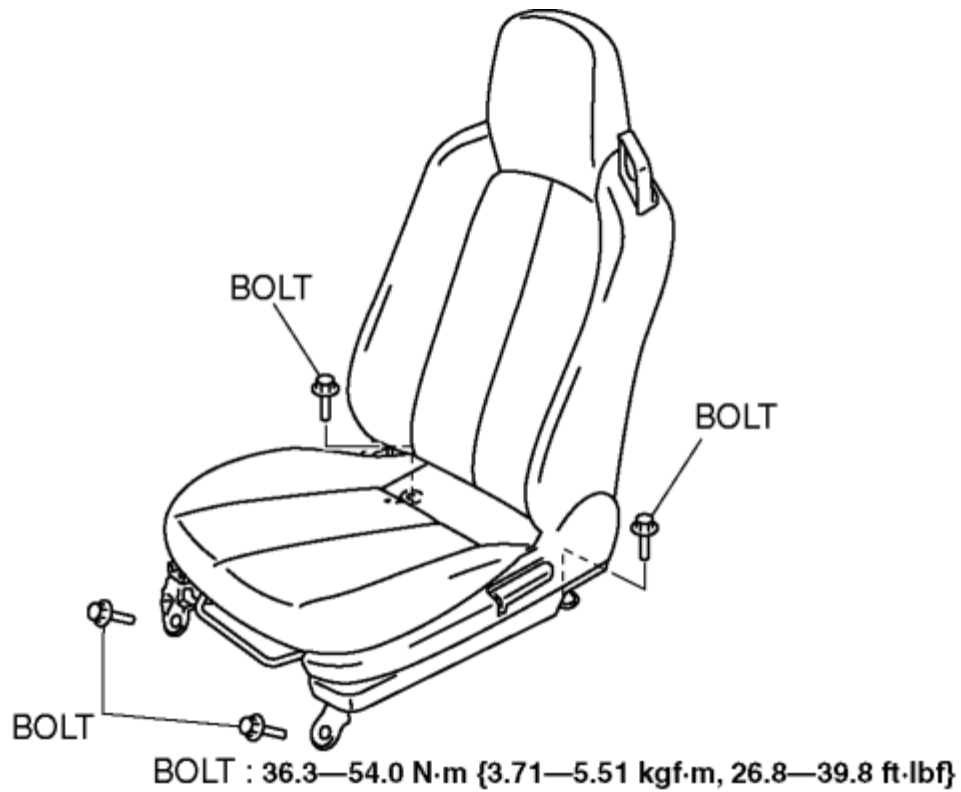
6. Insert your hand through part a shown in the figure and pull the anchor cover outward. (passenger"s seat)



7. Detach the clip tabs and slide the anchor cover to the vehicle front and remove it. (passenger"s seat)

8. Remove the lower anchor installation bolt of the seat belt. (passenger"s seat) (See [SEAT BELT REMOVAL/INSTALLATION.](#))

9. Remove the bolts, then remove the seat.



10. Install in the reverse order of removal.

11. Perform the weight sensor initialization procedure. (See [SEAT WEIGHT SENSOR CALIBRATION](#).)

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## 2008 - MX-5 - Body and Accessories

### SEAT DISASSEMBLY/ASSEMBLY

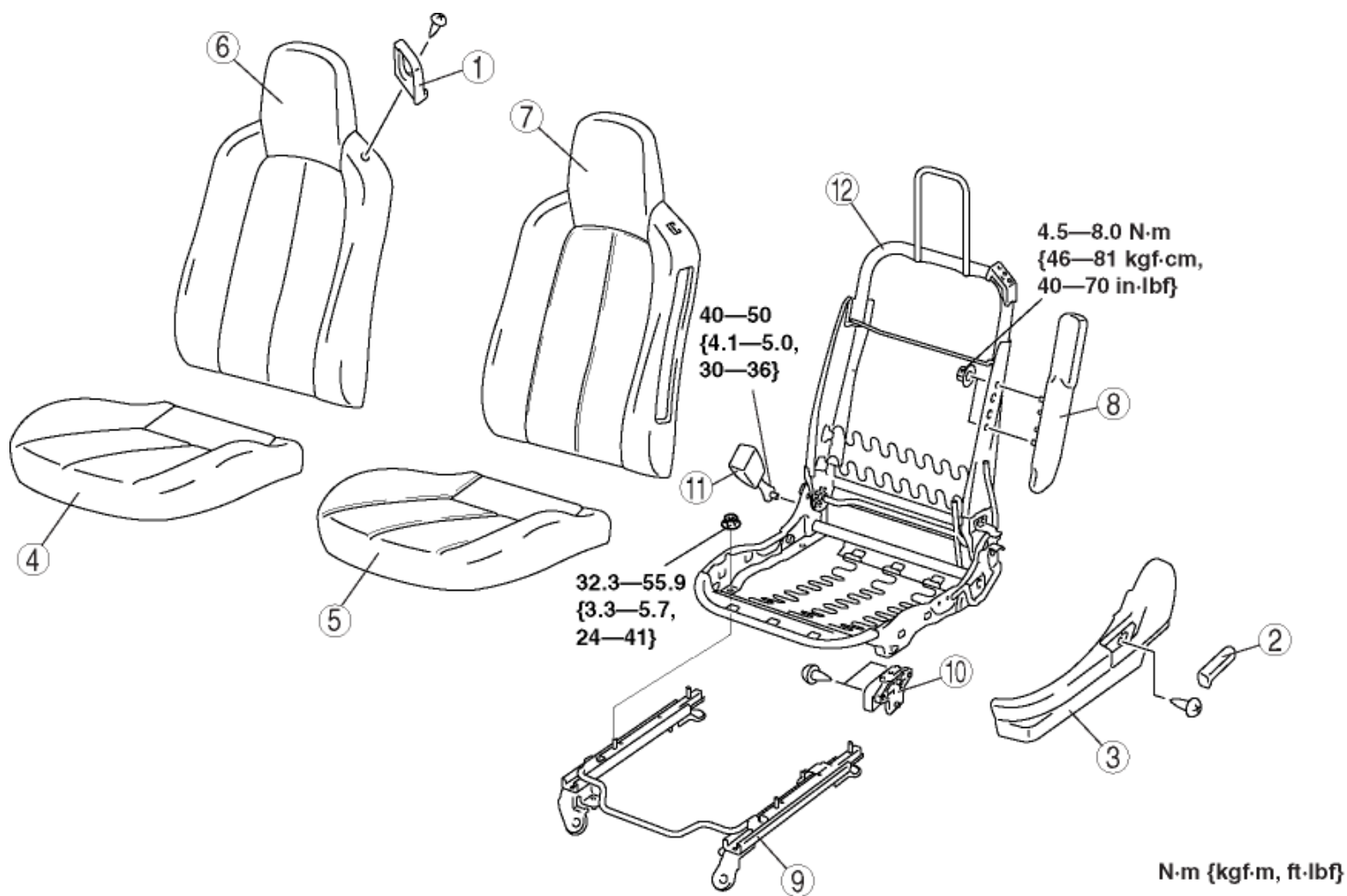
#### WARNING:

- Handling the seat (side air bag, seat weight sensor) improperly can accidentally deploy the side air bag, which may seriously injure you. Read the service warnings and cautions before handling the seat. (See **AIR BAG SYSTEM SERVICE WARNINGS.**) (See **AIR BAG SYSTEM SERVICE CAUTIONS.**)

#### CAUTION:

- If any of the following work is performed, perform the seat weight sensor calibration using the M-MDS. (See **SEAT WEIGHT SENSOR CALIBRATION.**)
    - Replacement with a new seat weight sensor
    - Replacement with a new seat weight sensor control module
    - Replacement with new passenger-side seat parts
    - Disassembly of the passenger-side seat
  - If any of the following work is performed, perform the seat weight sensor inspection using the M-MDS. (See **SEAT WEIGHT SENSOR INSPECTION.**)
    - Removal of the passenger-side seat
    - Loosening and retightening of passenger's seat fixing bolts
1. Disassemble in the order indicated in the table.
  2. Assemble in the reverse order of disassembly.

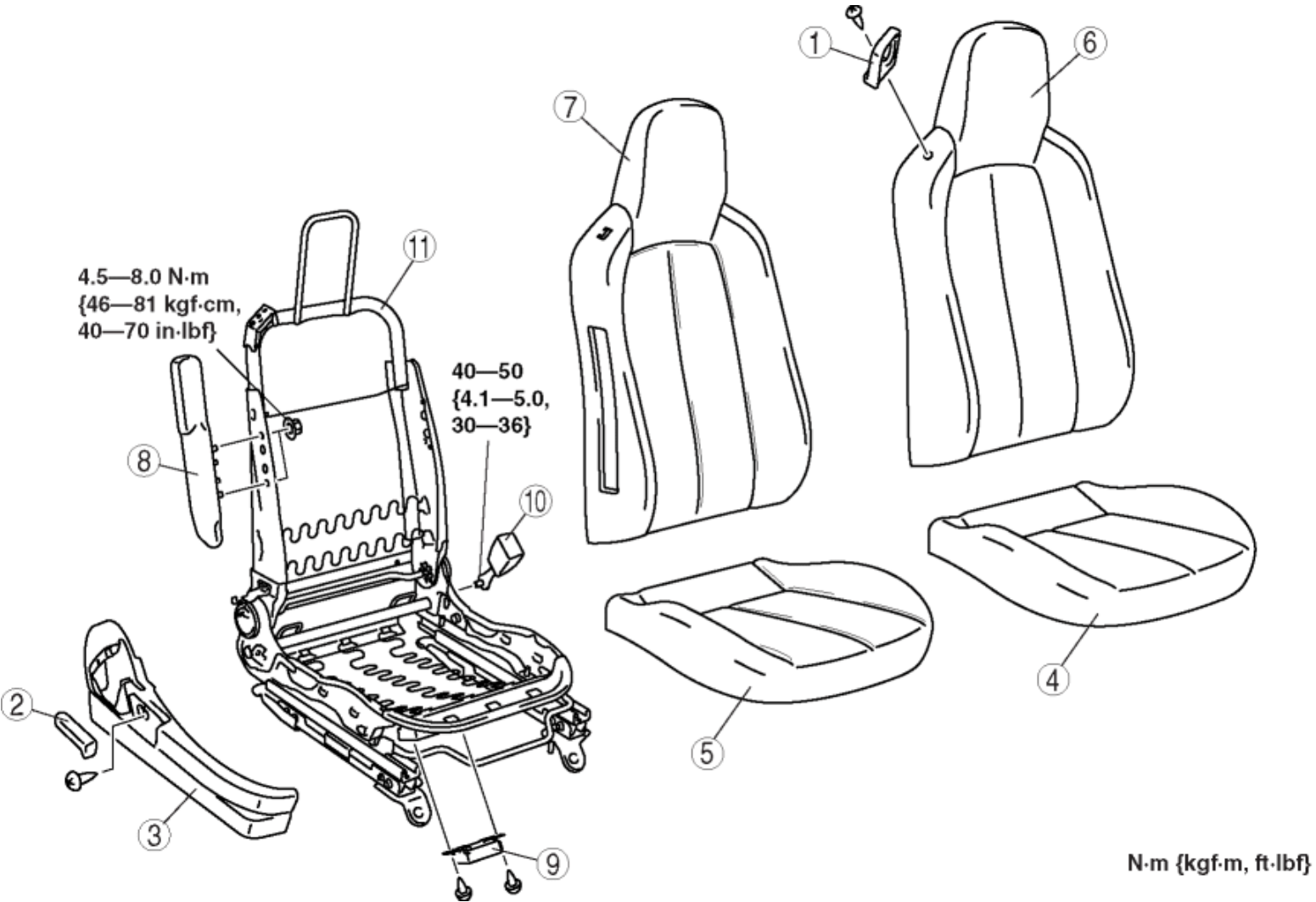
### Driver's Seat



1	Seat belt guide
2	Recliner lever
3	Side cover
4	Seat cushion trim
5	Seat cushion pad
6	Seat back trim
7	Seat back pad
8	Side air bag module (See <a href="#">SIDE AIR BAG MODULE REMOVAL/INSTALLATION.</a> )
9	Slide adjuster
	Seat track position sensor

10	(See <a href="#">SEAT TRACK POSITION SENSOR REMOVAL/INSTALLATION.</a> )
Buckle	
11	(See <a href="#">BUCKLE REMOVAL/INSTALLATION.</a> )
12	Seat frame

**Passenger"s Seat**



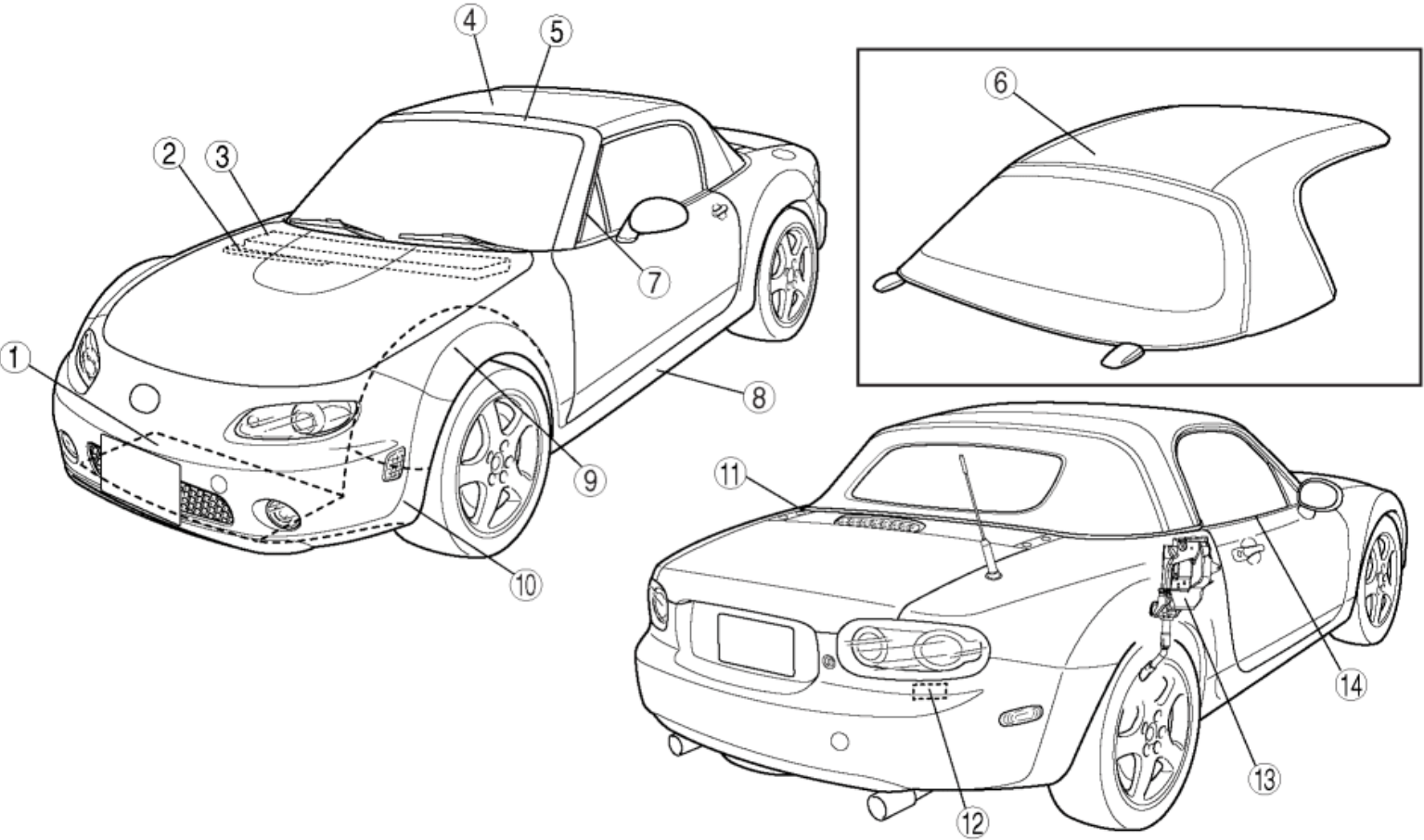
1	Seat belt guide
2	Recliner lever
3	Side cover
4	Seat cushion trim

5	Seat cushion pad
6	Seat back trim
7	Seat back pad
8	Side air bag module (See <a href="#">SIDE AIR BAG MODULE REMOVAL/INSTALLATION.</a> )
9	Seat weight sensor control module (See <a href="#">SEAT WEIGHT SENSOR CONTROL MODULE REMOVAL/INSTALLATION.</a> )
10	Buckle (See <a href="#">BUCKLE REMOVAL/INSTALLATION.</a> )
11	Seat frame

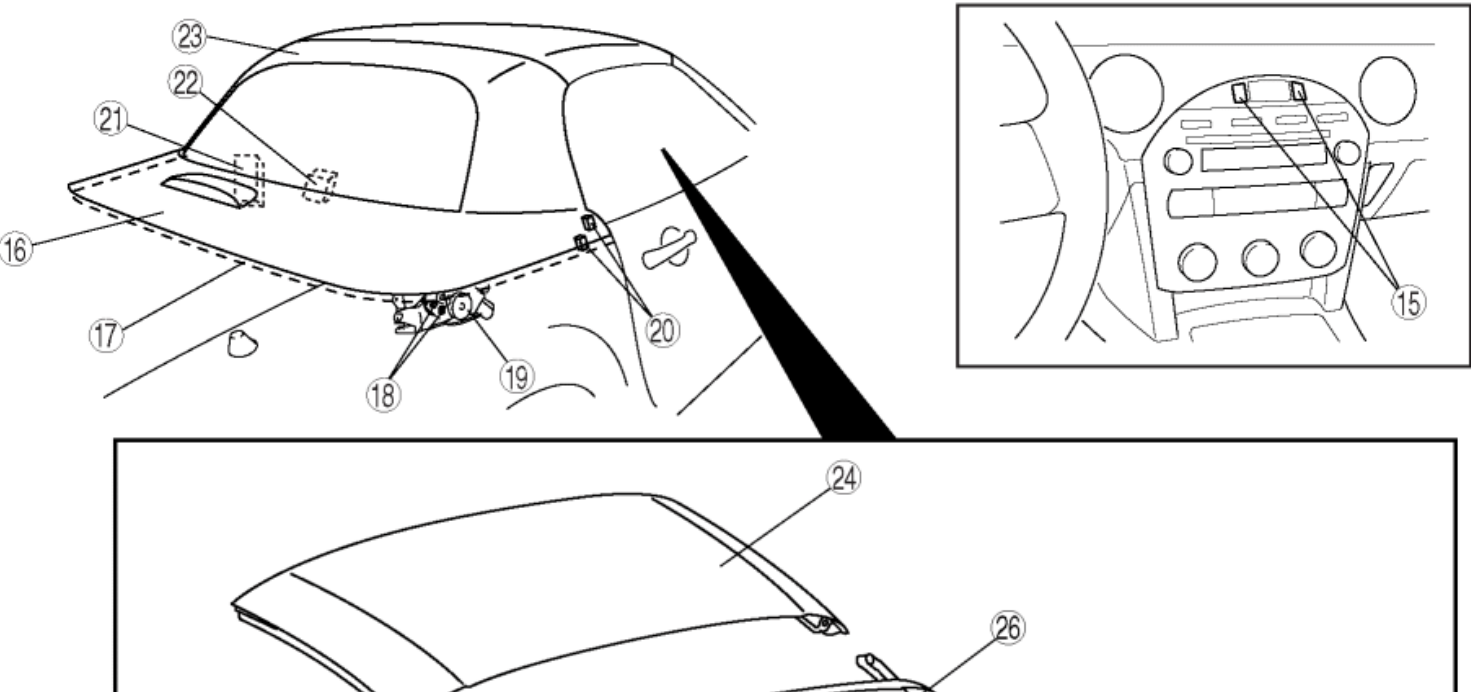


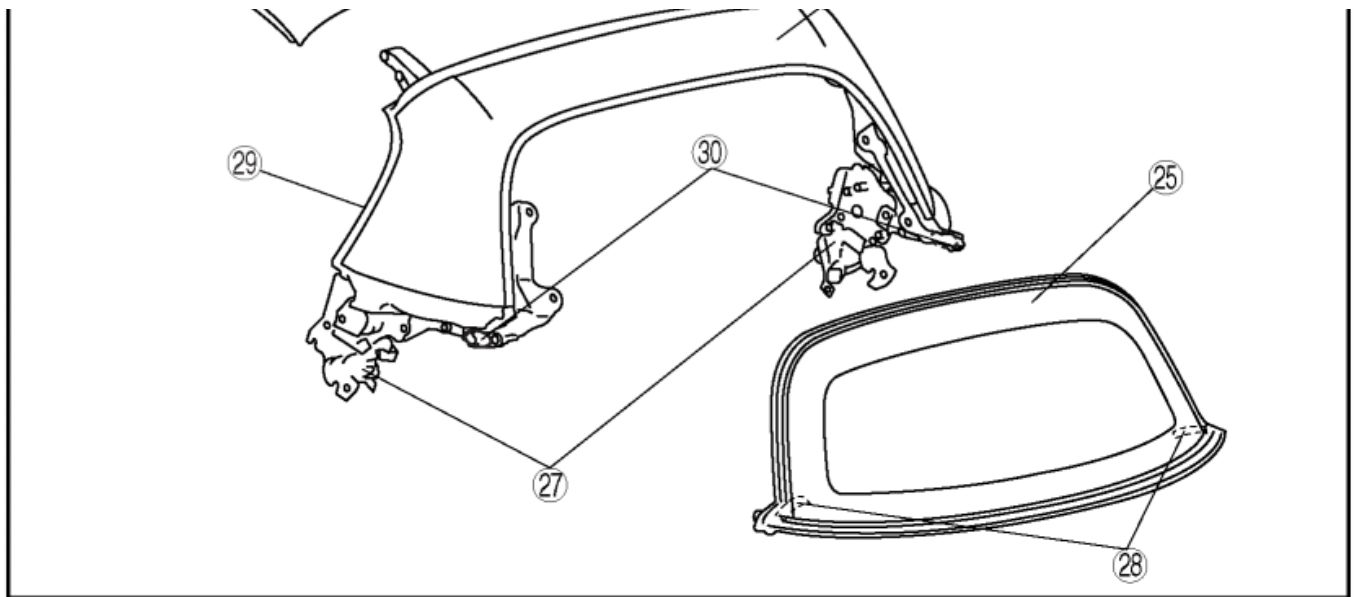
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EXTERIOR TRIM LOCATION INDEX



VEHICLE WITH POWER RETRACTABLE HARDTOP





1	Front under cover (See <a href="#">FRONT UNDER COVER REMOVAL/INSTALLATION.</a> )
2	Side cowl grille (See <a href="#">SIDE COWL GRILLE REMOVAL/INSTALLATION.</a> )
3	Cowl grille (See <a href="#">COWL GRILLE REMOVAL/INSTALLATION.</a> )
4	Convertible top (See <a href="#">CONVERTIBLE TOP REMOVAL/INSTALLATION.</a> ) (See <a href="#">CONVERTIBLE TOP DISASSEMBLY/ASSEMBLY.</a> ) (See <a href="#">CONVERTIBLE TOP ADJUSTMENT.</a> )
5	Windshield garnish (See <a href="#">WINDSHIELD GARNISH REMOVAL.</a> ) (See <a href="#">WINDSHIELD GARNISH INSTALLATION.</a> )
6	Detachable hardtop (See <a href="#">DETACHABLE HARDTOP DISASSEMBLY/ASSEMBLY.</a> ) (See <a href="#">DETACHABLE HARDTOP ADJUSTMENT.</a> )
7	Drip molding (See <a href="#">DRIP MOLDING REMOVAL/INSTALLATION.</a> )
8	Side step molding (See <a href="#">SIDE STEP MOLDING REMOVAL.</a> ) (See <a href="#">SIDE STEP MOLDING INSTALLATION.</a> )
9	splash shield A

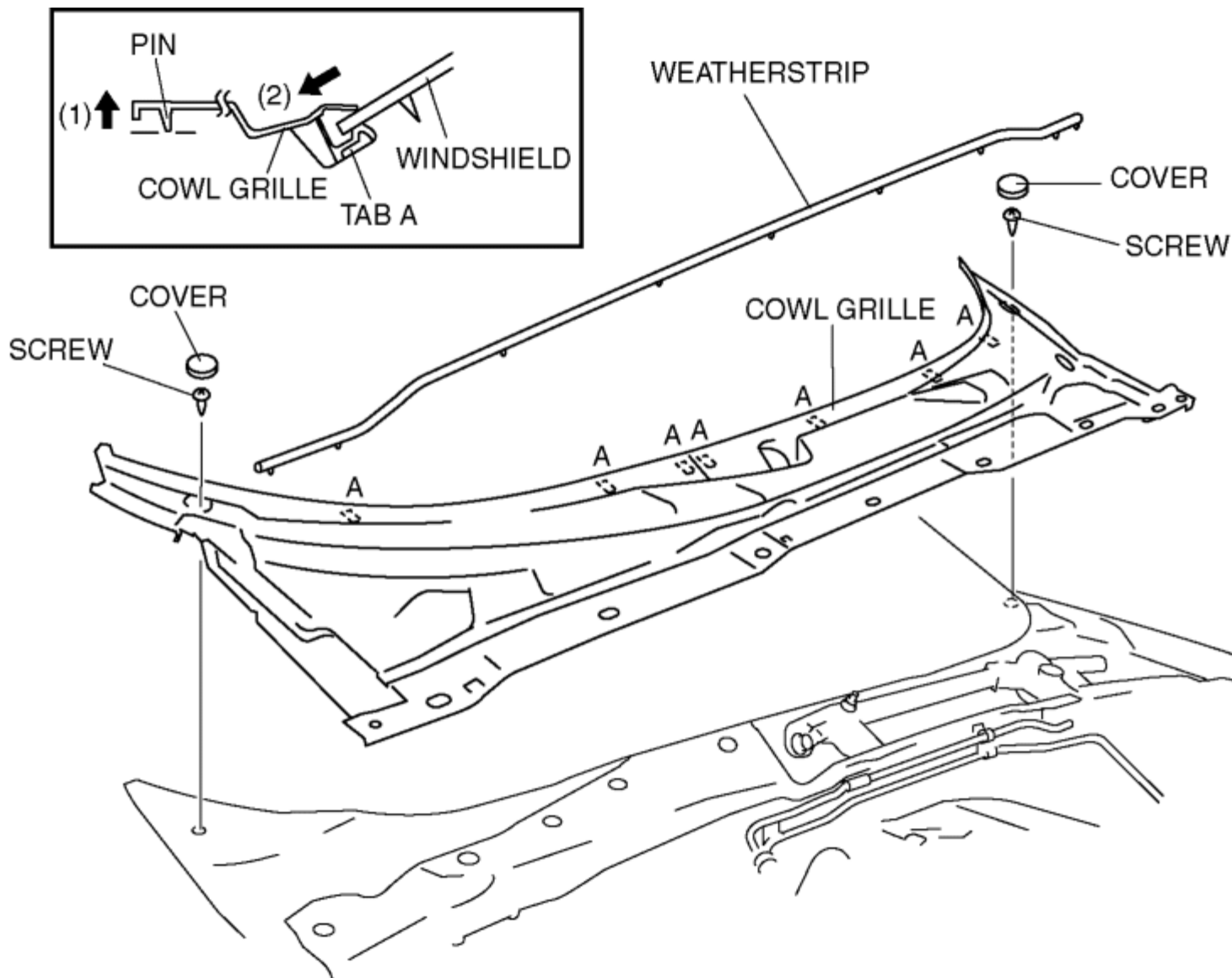
	(See <a href="#">SPLASH SHIELD REMOVAL/INSTALLATION.</a> )
10	splash shield B (See <a href="#">SPLASH SHIELD REMOVAL/INSTALLATION.</a> )
11	Beltline molding (See <a href="#">BELTLINE MOLDING REMOVAL/INSTALLATION.</a> )
12	Extractor chamber (See <a href="#">EXTRACTOR CHAMBER REMOVAL/INSTALLATION.</a> )
13	Drain cover (See <a href="#">DRAIN COVER REMOVAL/INSTALLATION.</a> )
14	Front beltline molding (See <a href="#">FRONT BELTLINE MOLDING REMOVAL/INSTALLATION.</a> )
15	Retractable hardtop switch (See <a href="#">POWER RETRACTABLE HARDTOP SWITCH REMOVAL/INSTALLATION.</a> ) (See <a href="#">POWER RETRACTABLE HARDTOP SWITCH INSPECTION.</a> )
16	Deck panel (See <a href="#">DECK PANEL REMOVAL/INSTALLATION.</a> ) (See <a href="#">DECK PANEL DISASSEMBLY/ASSEMBLY.</a> ) (See <a href="#">DECK PANEL ADJUSTMENT.</a> )
17	Rear deck weatherstrip (See <a href="#">REAR DECK WEATHERSTRIP REMOVAL.</a> ) (See <a href="#">REAR DECK WEATHERSTRIP INSTALLATION.</a> )
18	Deck panel limit switch (See <a href="#">DECK PANEL LIMIT SWITCH REMOVAL/INSTALLATION.</a> ) (See <a href="#">DECK PANEL LIMIT SWITCH INSPECTION.</a> )
19	Deck panel motor (See <a href="#">DECK PANEL MOTOR REMOVAL/INSTALLATION.</a> ) (See <a href="#">DECK PANEL MOTOR INSPECTION.</a> )
20	Power retractable hardtop limit switch (See <a href="#">POWER RETRACTABLE HARDTOP LIMIT SWITCH REMOVAL/INSTALLATION.</a> ) (See <a href="#">POWER RETRACTABLE HARDTOP LIMIT SWITCH INSPECTION.</a> )
21	Power retractable hardtop control module (See <a href="#">POWER RETRACTABLE HARDTOP CONTROL MODULE REMOVAL/INSTALLATION.</a> ) (See <a href="#">POWER RETRACTABLE HARDTOP CONTROL MODULE INSPECTION.</a> ) (See <a href="#">POWER RETRACTABLE HARDTOP CONTROL MODULE BRACKET REMOVAL/INSTALLATION.</a> )

22	Roof hook  (See <a href="#">ROOF HOOK REMOVAL/INSTALLATION.</a> )  (See <a href="#">ROOF HOOK CABLE REMOVAL/INSTALLATION.</a> )
23	Power retractable hardtop  (See <a href="#">POWER RETRACTABLE HARDTOP REMOVAL/INSTALLATION.</a> )  (See <a href="#">POWER RETRACTABLE HARDTOP ADJUSTMENT.</a> )
24	Front roof panel  (See <a href="#">FRONT ROOF PANEL REMOVAL/INSTALLATION.</a> )  (See <a href="#">FRONT ROOF PANEL DISASSEMBLY/ASSEMBLY.</a> )
25	Rear window glass  (See <a href="#">REAR WINDOW GLASS REMOVAL/INSTALLATION[POWER RETRACTABLE HARDTOP].</a> )
26	Middle roof panel  (See <a href="#">MIDDLE ROOF PANEL REMOVAL/INSTALLATION.</a> )  (See <a href="#">MIDDLE ROOF PANEL DISASSEMBLY/ASSEMBLY.</a> )
27	Roof motor  (See <a href="#">ROOF MOTOR REMOVAL/INSTALLATION.</a> )  (See <a href="#">ROOF MOTOR INSPECTION.</a> )
28	Power retractable hardtop drain hose  (See <a href="#">POWER RETRACTABLE HARDTOP DRAIN HOSE REMOVAL/INSTALLATION.</a> )
29	Middle roof panel weatherstrip  (See <a href="#">MIDDLE ROOF PANEL WEATHERSTRIP REMOVAL/INSTALLATION.</a> )
30	Roof link lock  (See <a href="#">ROOF LINK REMOVAL/INSTALLATION.</a> )

## 2008 - MX-5 - Body and Accessories

### COWL GRILLE REMOVAL/INSTALLATION

1. Remove the windshield wiper arm and blade. (See [WIPER ARM AND BLADE REMOVAL/INSTALLATION.](#))
2. Remove the covers.



3. Remove the screws.
4. Remove windshield washer hose from cowl grille.
5. Remove the weatherstrip.
6. Pull the cowl grille in the direction of arrow (1) so that it is free from the pins, pull tabs A in the direction of arrow (2), and then remove the front window glass.

7. Remove the cowl grille.
8. Install in the reverse order of removal.

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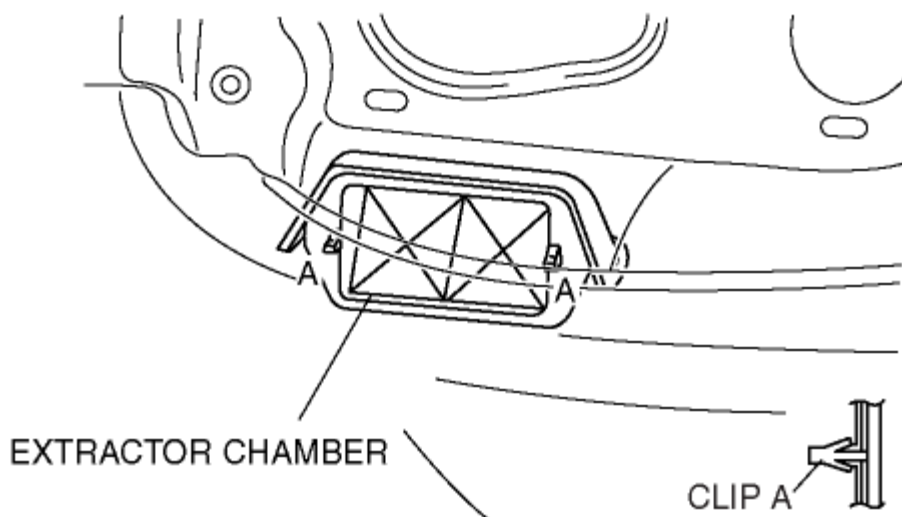
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## 2008 - MX-5 - Body and Accessories

### EXTRACTOR CHAMBER REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the rear combination light. (See [REAR COMBINATION LIGHT REMOVAL/INSTALLATION](#).)
4. Remove clip A using a fastener remover and then remove the extractor chamber from the vehicle.

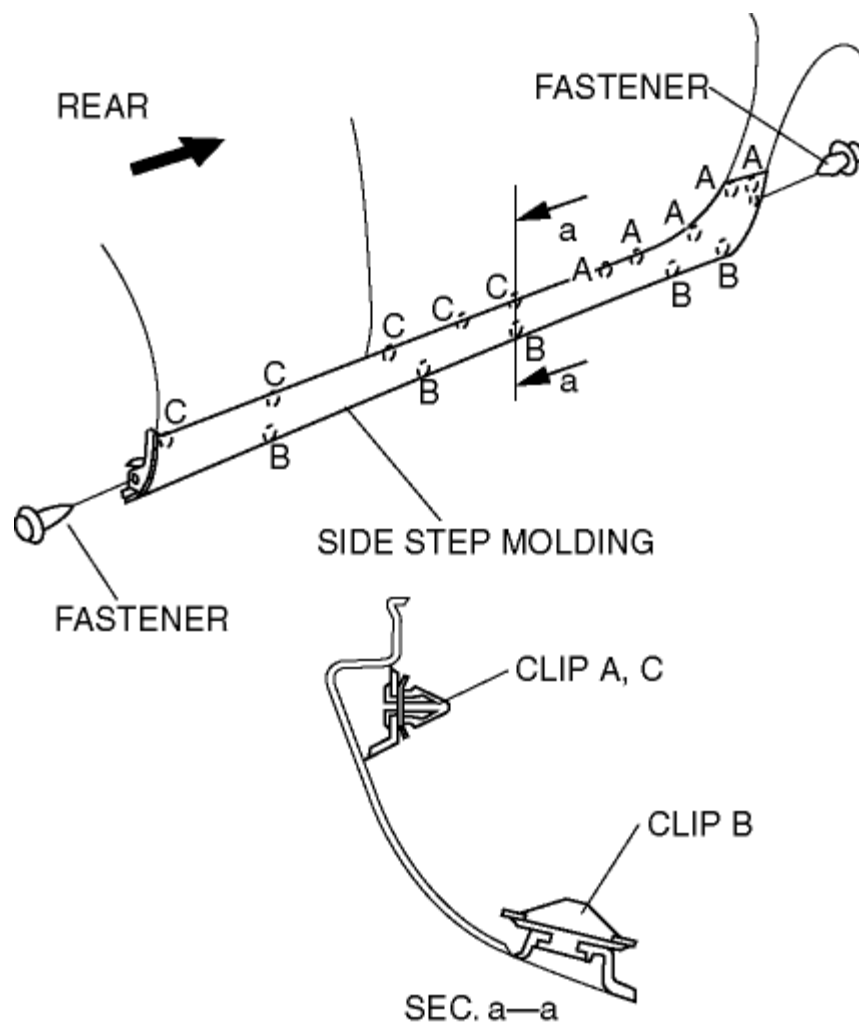


5. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### SIDE STEP MOLDING INSTALLATION

1. Install clips A and then C to the vehicle from the rear side.



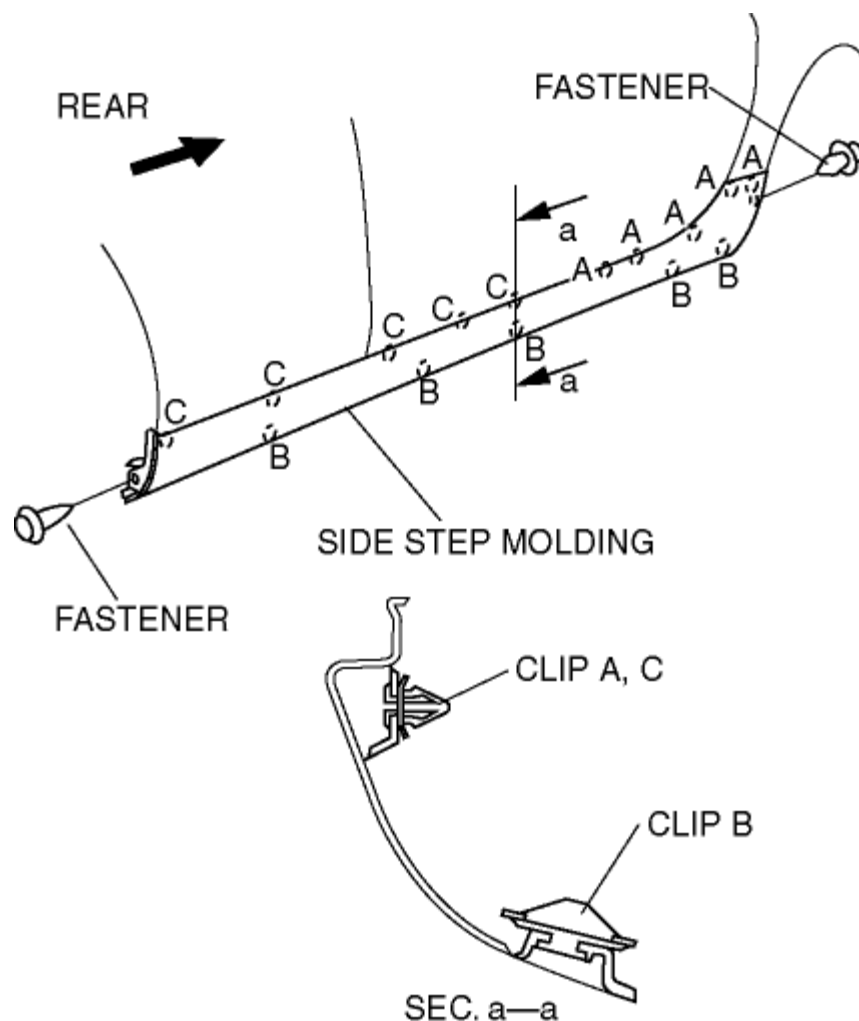
2. Install the clips B.
3. install the fasteners.



## 2008 - MX-5 - Body and Accessories

### SIDE STEP MOLDING REMOVAL

1. Remove the fasteners.

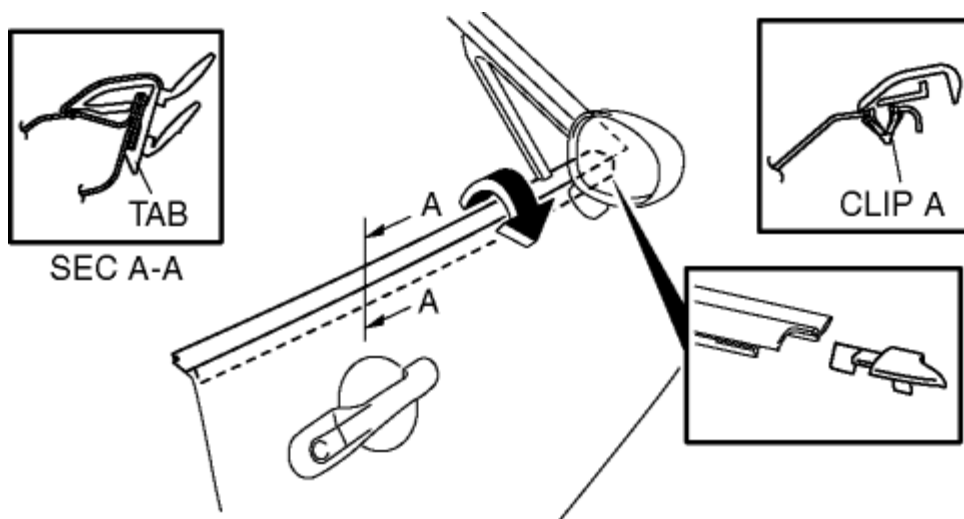


2. Pull the side step molding and remove clips A from the vehicle body.
3. Slide the side step molding to the vehicle rear and remove clips B and C from the side step molding.
4. Remove the side step molding.
5. Remove clips B and C from the body, then install it to the side step molding.

## 2008 - MX-5 - Body and Accessories

### FRONT BELTLINE MOLDING REMOVAL/INSTALLATION

1. Fully open the door glass.
2. Remove clip A using a protective tape-wrapped flathead screwdriver.

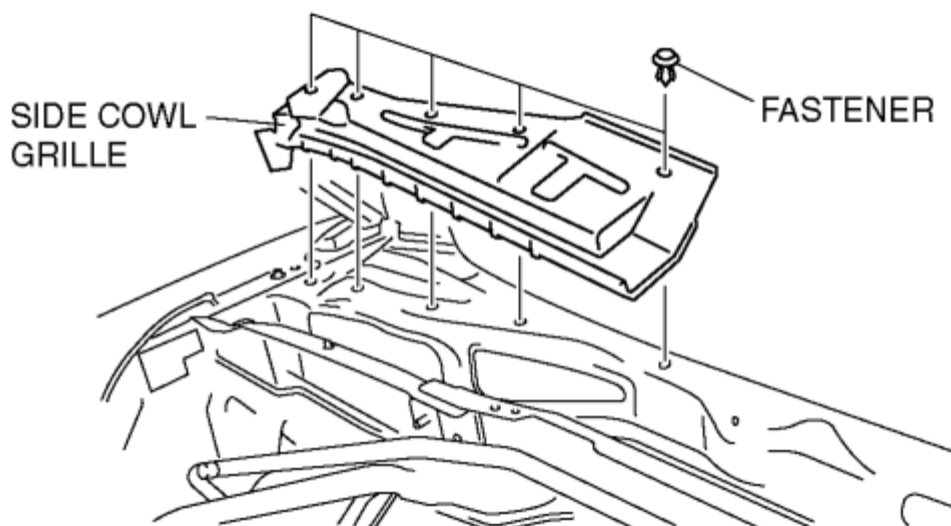


3. Lift (partially peeling back) the front beltline molding in the direction of the arrow and remove it.
4. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### SIDE COWL GRILLE REMOVAL/INSTALLATION

1. Remove the windshield wiper arm and blade. (See [WIPER ARM AND BLADE REMOVAL/INSTALLATION](#).)
2. Remove the cowl grille. (See [COWL GRILLE REMOVAL/INSTALLATION](#).)
3. Remove the fasteners.



4. Remove the side cowl grill.
5. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

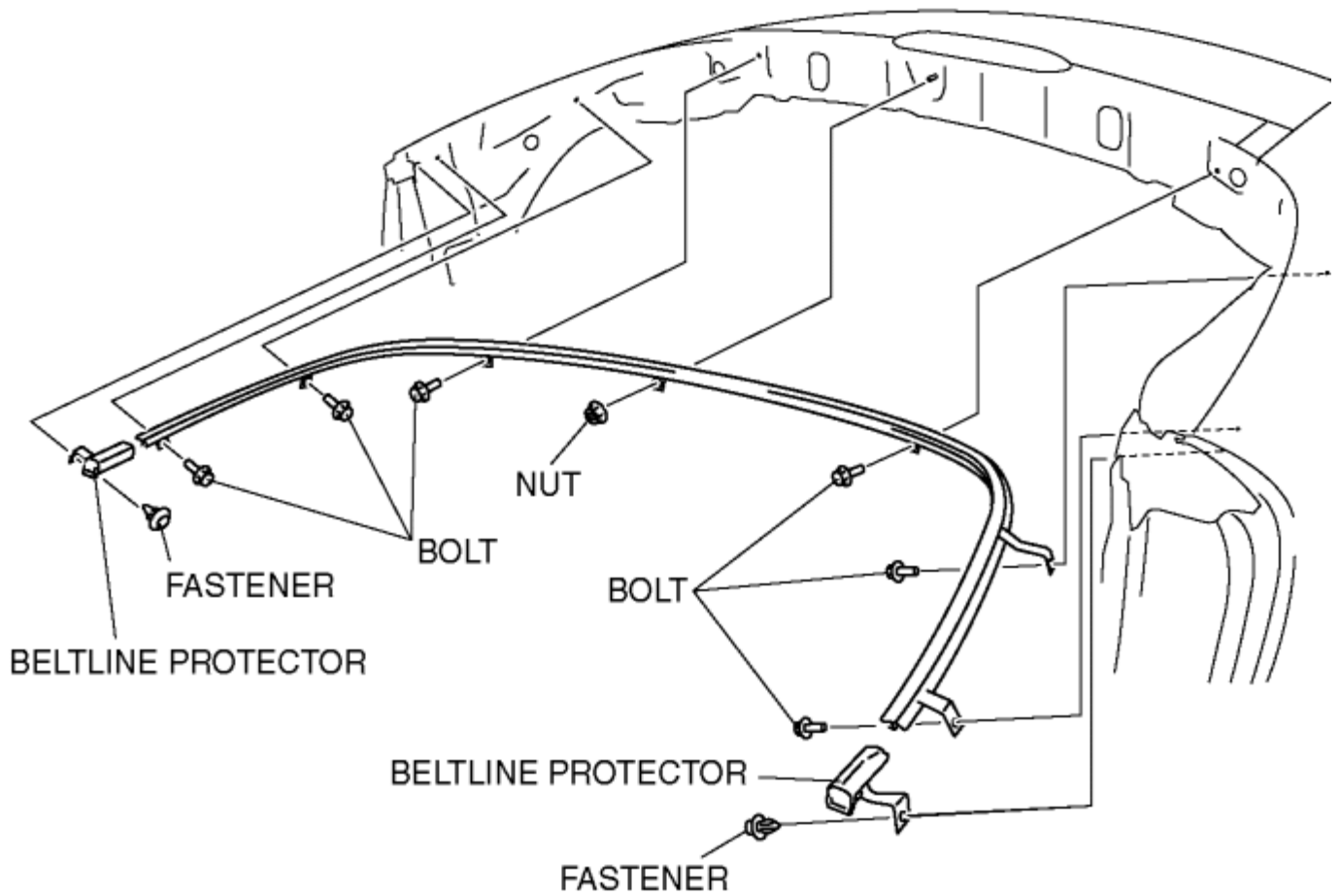
### BELTLINE MOLDING REMOVAL/INSTALLATION

1. Remove the following parts:

- a. Console (See [CONSOLE REMOVAL/INSTALLATION.](#))
- b. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION.](#))
- c. Scuff plate ([SCUFF PLATE REMOVAL/INSTALLATION.](#))
- d. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION.](#))
- e. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION.](#))
- f. Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION.](#))
- g. Back trim (See [BACK TRIM REMOVAL/INSTALLATION.](#))
- h. Seat belt set plate (See [SEAT BELT REMOVAL/INSTALLATION.](#))
- i. Seat back crossmember assembly (See [SEAT BACK CROSSMEMBER ASSEMBLY REMOVAL/INSTALLATION.](#))
- j. Rear side trim (See [REAR SIDE TRIM REMOVAL/INSTALLATION.](#))
- k. Rear package trim (See [REAR PACKAGE TRIM REMOVAL/INSTALLATION.](#))
- l. Side shelf (See [SIDE SHELF REMOVAL/INSTALLATION.](#))
- m. Seat belt upper anchor installation bolt (See [SEAT BELT REMOVAL/INSTALLATION.](#))
- n. Convertible top (See [CONVERTIBLE TOP REMOVAL/INSTALLATION.](#))

2. Remove the fasteners.

BOLT, NUT: 7.9—10.0 N·m {80.6—101.9 kgf·cm, 70.0—88.5 in·lbf}



3. Remove the beltline protector.
4. Remove the nut and bolts.
5. Remove the beltline molding.
6. Install in the reverse order of removal.

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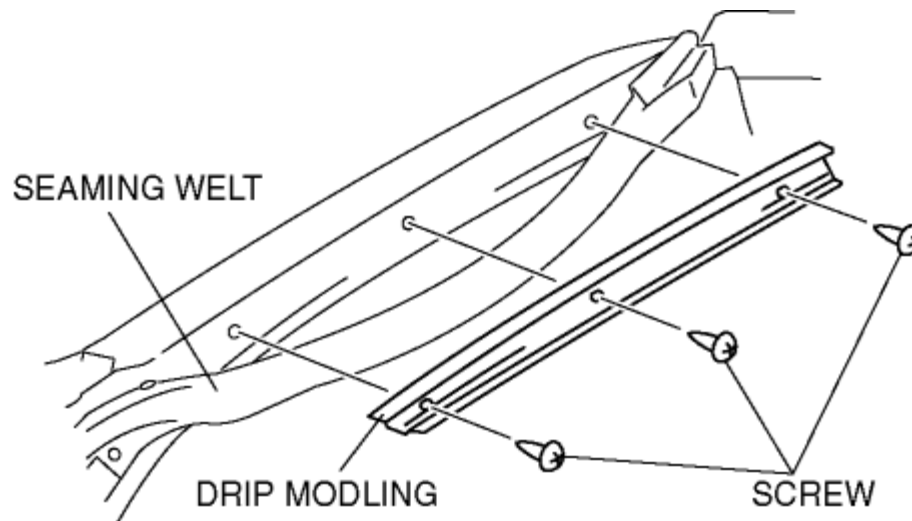
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## 2008 - MX-5 - Body and Accessories

### DRIP MOLDING REMOVAL/INSTALLATION

1. Partially peel back the seaming welt.
2. Remove the screws.

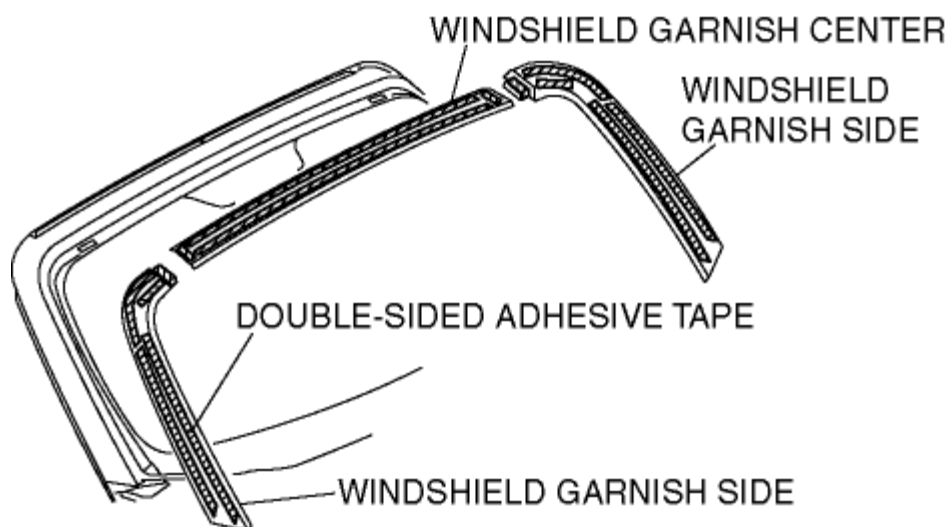


3. Remove the drip molding.
4. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### WINDSHIELD GARNISH REMOVAL

1. Cut the double-sided adhesive tape on the windshield garnish using a flathead screwdriver or razor while warming it using a hot air blower.



#### WARNING:

- Using a razor with bare hands can cause injury. Always wear gloves when using a razor.

2. Remove the windshield garnish.

## 2008 - MX-5 - Body and Accessories

### WINDSHIELD GARNISH INSTALLATION

#### WARNING:

- Using a razor with bare hands can cause injury. Always wear gloves when using a razor.

#### NOTE:

- Double-sided adhesive tape has already been attached to the new windshield garnish

1. When installing a new windshield garnish, follow the procedure below:

- a. Remove the adhesive remaining on the body using razor.
- b. Remove any grease or dirt from the adhesion surface of the body.

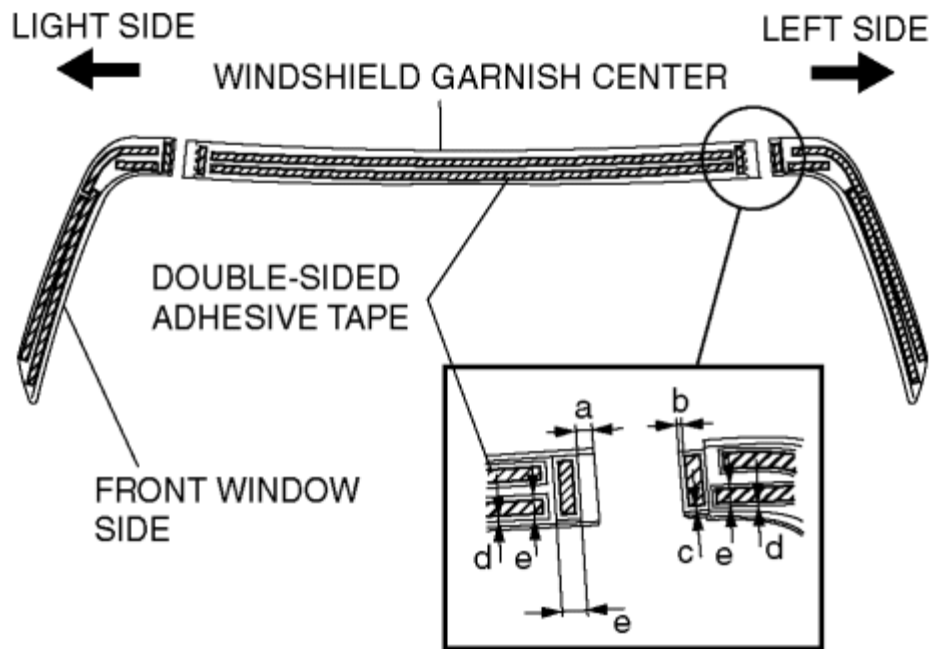
2. When reusing the windshield garnish, follow the procedure below:

- a. Remove the adhesive remaining on the windshield garnish and the body using a razor.
- b. Remove any grease or dirt from the adhesion surface of the windshield garnish and body.
- c. Apply primer to the bonding area of the windshield garnish.
- d. Attach double-sided adhesive tape to the windshield garnish as shown in the figure.

#### Clearance

- a: 16 mm {0.62 in}
- b: 2.0 mm {0.07 in}
- c: 1.5 mm {0.05 in}
- d: 2.0 mm {0.07 in}
- e: 16 mm {0.62 in}





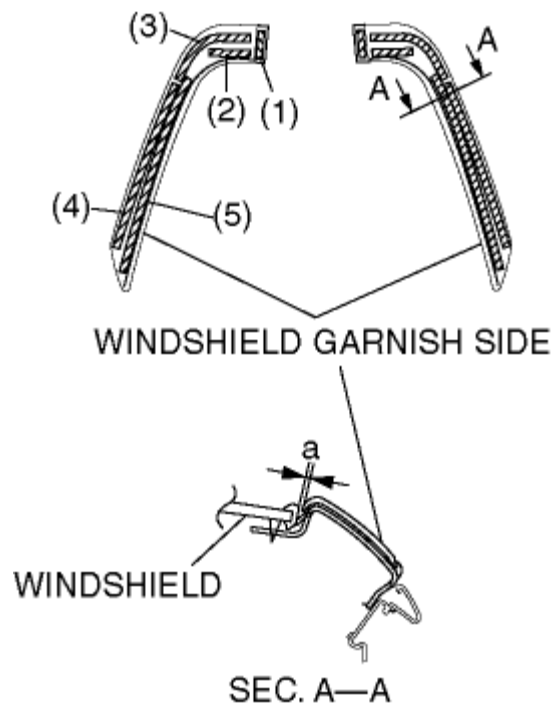
**NOTE:**

- Use 3M GT7116, GT7116FR and GT7104 double-sided adhesive tape or equivalent.

3. Peel off the end of the double-sided adhesive tape (1), (2), and (3), and attach the windshield garnish side to the position shown in the figure.

**Clearance**

- a: 0.3—1.7 mm {0.012—0.066 in}



4. Peel off the tape backing from the double-sided adhesive tape (1), (2), and (3), and attach it to the vehicle.

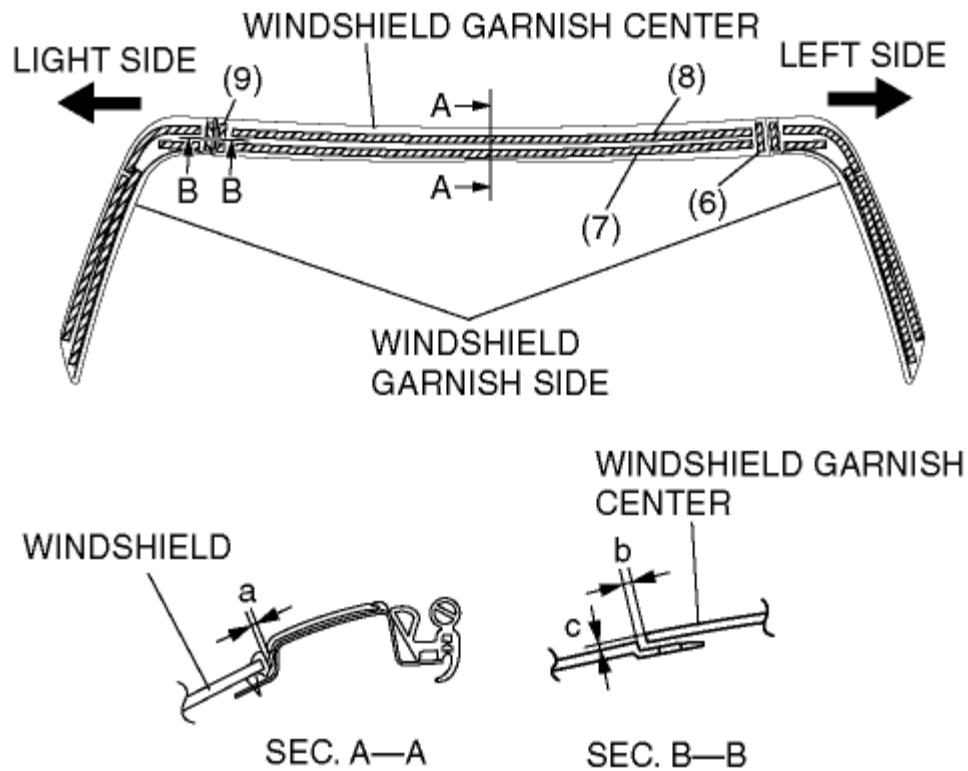
5. Peel off the end of the double-sided adhesive tape (4) and (5), and attach it to the position shown in the figure.

6. Peel off the tape backing from the double-sided adhesive tape (4) and (5), and then adhere the windshield garnish side.

7. Peel off the end of the double-sided adhesive tape (6) and attach the windshield garnish center to the position shown in the figure.

#### Clearance

- a: 0.3—1.7 mm {0.012—0.06 in}
- b: -0.3—2.3 mm {-0.012—0.090 in}
- c: 0.0—0.7 mm {0.00—0.027 in}



8. Peel off the end of the double-sided adhesive tape (7) and attach it to the position shown in the figure.

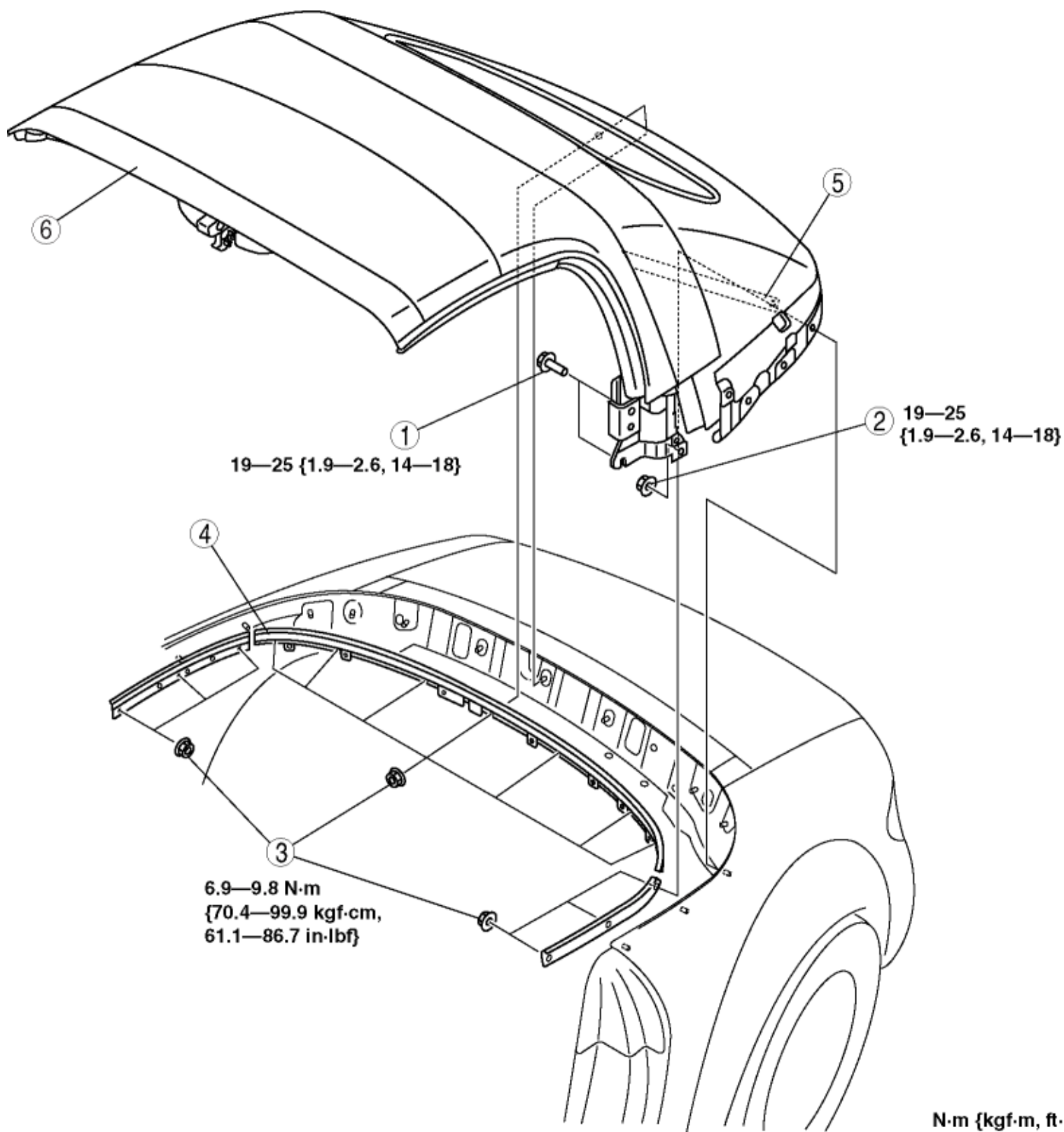
9. Peel off the backing paper from the double-sided adhesive tape (6) and (7), and then attach the windshield garnish center by applying pressure.

10. Peel off the tape backing from the double-sided adhesive tape (8) and (9), and then adhere the windshield garnish center.

## 2008 - MX-5 - Body and Accessories

### CONVERTIBLE TOP REMOVAL/INSTALLATION

1. Cover both sides of the rear window glass with thick cloth to protect the window.
2. Remove the following parts:
  - a. Console (See [CONSOLE REMOVAL/INSTALLATION.](#))
  - b. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION.](#))
  - c. Scuff plate ([SCUFF PLATE REMOVAL/INSTALLATION.](#))
  - d. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION.](#))
  - e. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION.](#))
  - f. Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION.](#))
  - g. Back trim (See [BACK TRIM REMOVAL/INSTALLATION.](#))
  - h. Seat belt set plate (See [SEAT BELT REMOVAL/INSTALLATION.](#))
  - i. Seat back crossmember assembly (See [SEAT BACK CROSSMEMBER ASSEMBLY REMOVAL/INSTALLATION.](#))
  - j. Rear side trim (See [REAR SIDE TRIM REMOVAL/INSTALLATION.](#))
  - k. Rear package trim (See [REAR PACKAGE TRIM REMOVAL/INSTALLATION.](#))
  - l. Side shelf (See [SIDE SHELF REMOVAL/INSTALLATION.](#))
  - m. Seat belt upper anchor installation bolt (See [SEAT BELT REMOVAL/INSTALLATION.](#))
3. Disconnect the rear window defroster connector.
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.



1 Bolt A

2 Nut A

3 Nut B

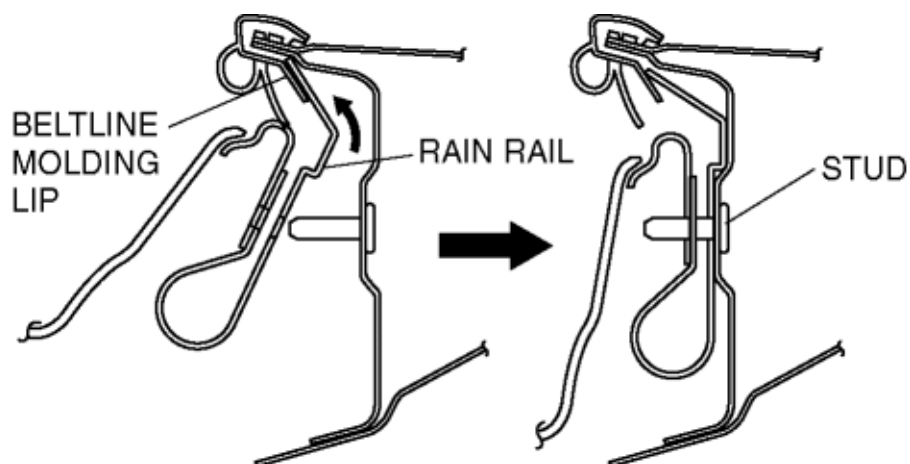
4	Set plate
5	Band
6	Convertible top (See <a href="#">Convertible Top Removal Note</a> ) (See <a href="#">Convertible Top Installation Note</a> )

### Convertible Top Removal Note

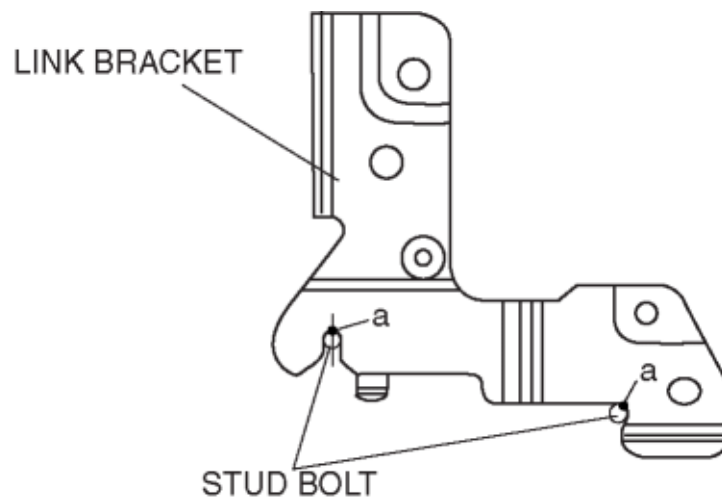
1. Unlock the top lock.

### Convertible Top Installation Note

1. Insert the rain rail into the beltline molding lip, and install it over the studs.



2. Install the link bracket to the stud bolts with no gaps (a) on the mating surfaces, then tighten the bolts and nut.



**Tightening torque**

- 19—25 N·m {1.9—2.6 kgf·m, 14—18 ft·lbf}

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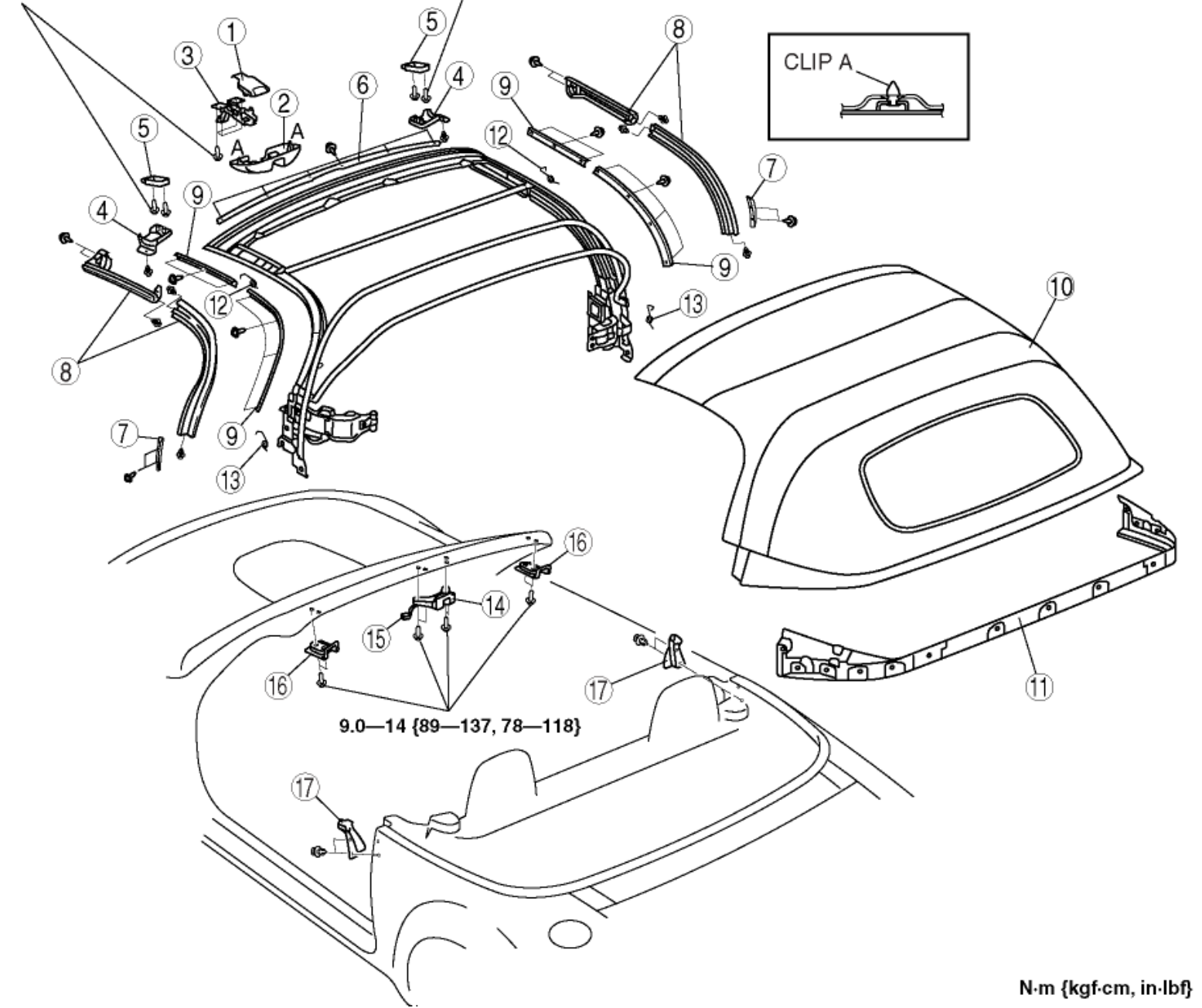
## 2008 - MX-5 - Body and Accessories

### CONVERTIBLE TOP DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.
2. To remove the striker, remove the following parts:
  - a. Female wedge (See [CONVERTIBLE TOP DISASSEMBLY/ASSEMBLY](#).)
  - b. Map light (See [MAP LIGHT REMOVAL/INSTALLATION](#).)
  - c. A-pillar trim (See [A-PILLAR TRIM REMOVAL/INSTALLATION](#).)
  - d. Front header trim (See [FRONT HEADER TRIM REMOVAL/INSTALLATION](#).)
3. Assemble in the reverse order of disassembly.

4.3—6.1 {43—63, 38—54}

4.3—6.1 {43—63, 38—54}



N·m {kgf·cm, in·lb}

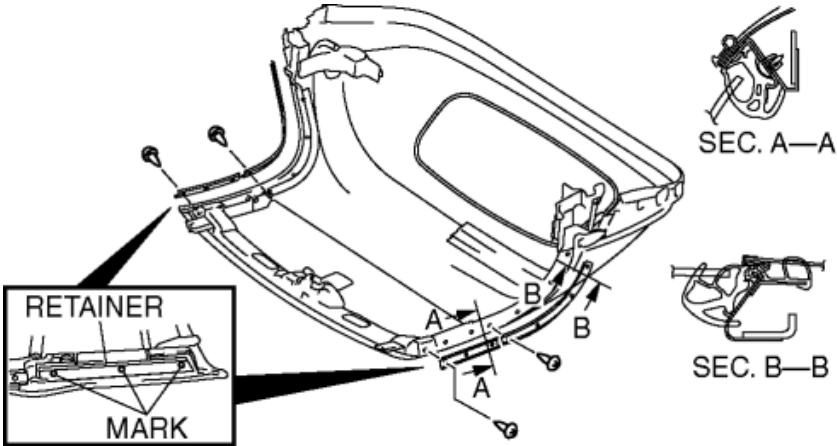
1	Top lock lever cover
2	Top lock cover
3	Top lock
4	Male wedge cover
5	Male wedge
6	Set plate
7	Slider



8	Weatherstrip
9	Retainer (See <a href="#">Retainer Disassembly Note.</a> ) (See <a href="#">Retainer Assembly Note.</a> )
10	Top fabric (See <a href="#">Top Fabric Disassembly Note.</a> ) (See <a href="#">Top Fabric Assembly Note.</a> )
11	Rain rail (See <a href="#">Rain Rail Disassembly Note.</a> ) (See <a href="#">Rain Rail Assembly Note.</a> )
12	Spring A (See <a href="#">Spring A Disassembly Note.</a> )
13	Spring B (See <a href="#">Spring B Disassembly Note.</a> )
14	Striker
15	Connector
16	Female wedge
17	Cab-side weatherstrip

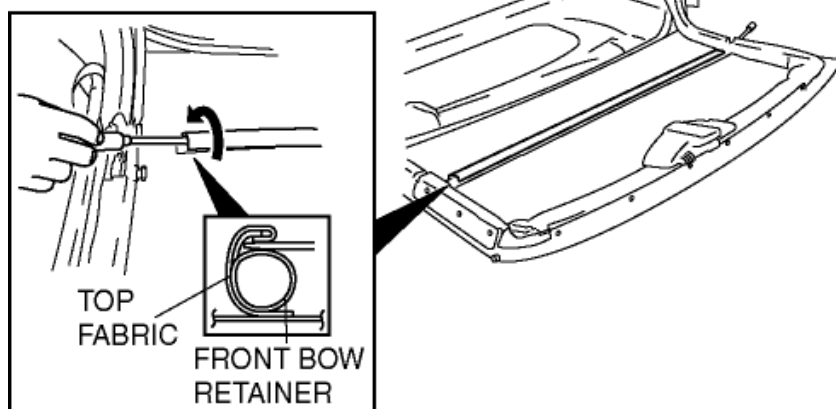
**Retainer Disassembly Note**

- 1. Mark around the retainer installation screws with paint before removing them.

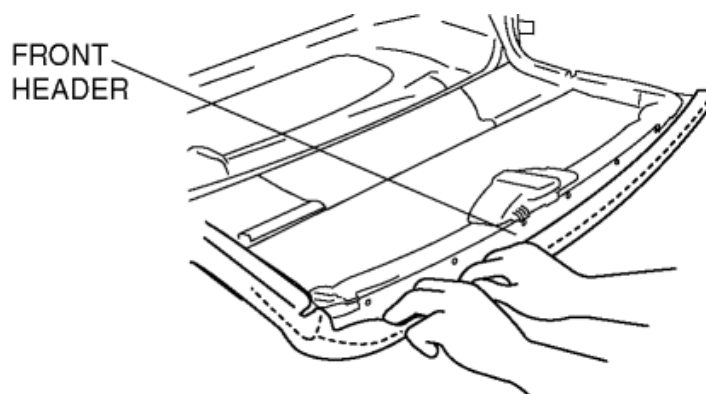


**Top Fabric Disassembly Note**

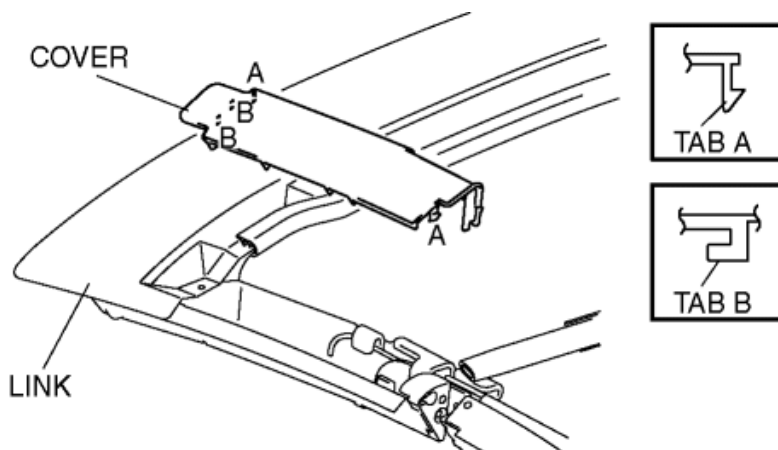
1. Remove the top fabric from the front bow retainer.



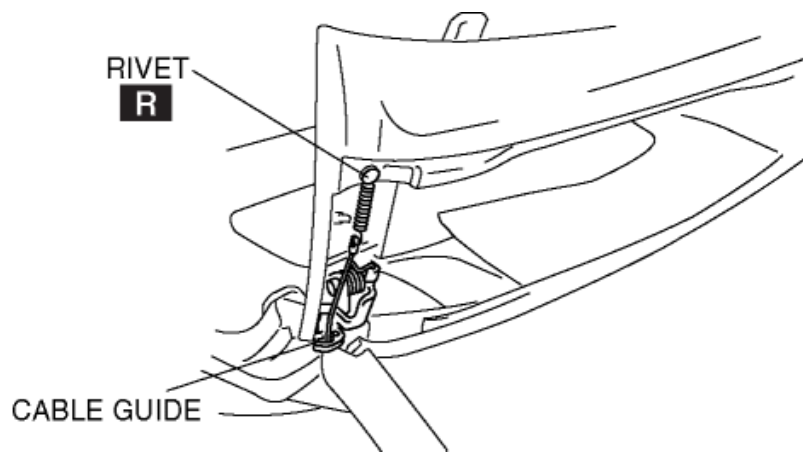
2. Pull out the top fabric from the front header.



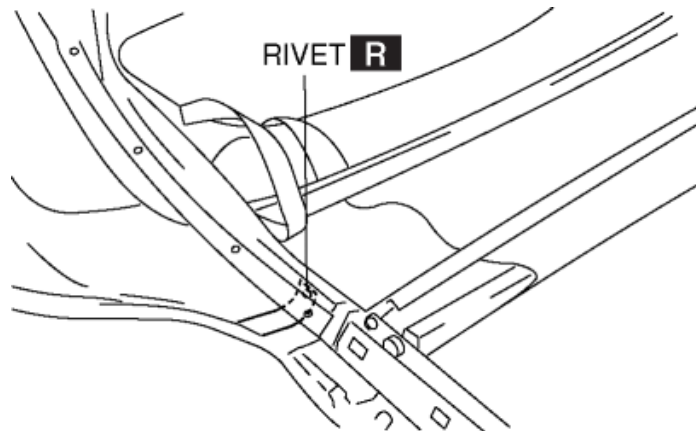
3. Remove the covers.



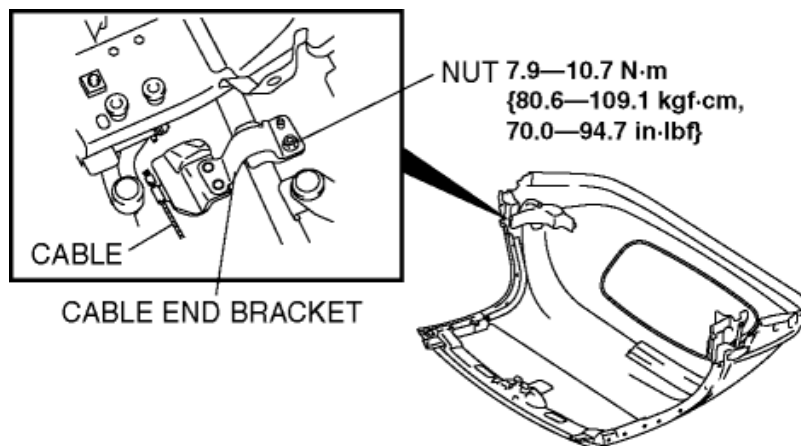
4. Remove the cable installation rivet using a drill.



5. Remove the cables from the cable guide.
6. Remove the band installation rivet using a drill.



7. Remove the nut, then remove the cable end bracket.

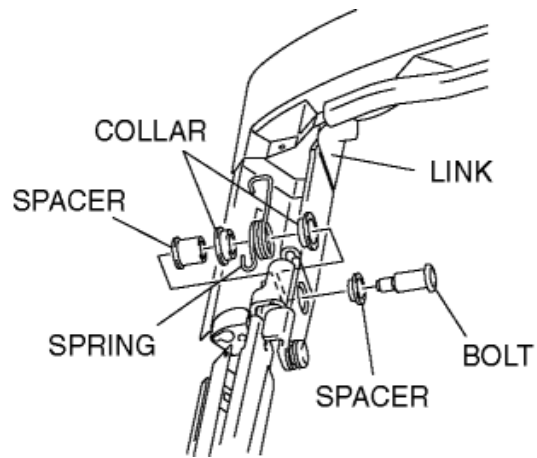


#### Rain Rail Disassembly Note

1. Remove the rivets from the top fabric using a drill.

#### Spring A Disassembly Note

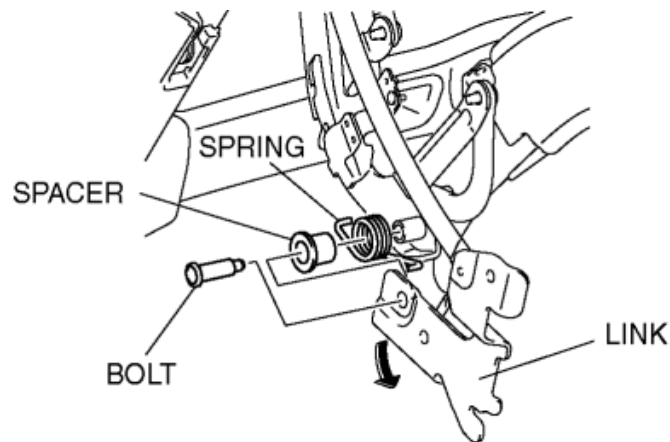
1. Remove the bolt.



2. Remove the spacers, spring and collars from the link.

### Spring B Disassembly Note

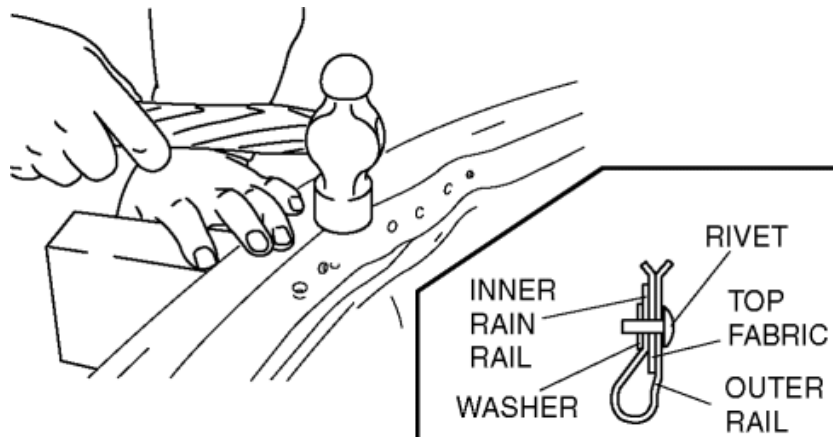
1. Remove the bolt.



2. Pull the link in the direction of the arrow to remove the spacer and spring.

### Rain Rail Assembly Note

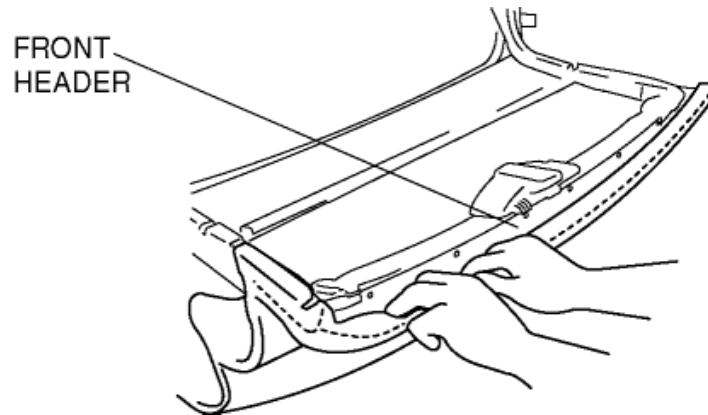
1. Degrease the rain rail using white gasoline.
2. Install the insulation tape to the rivet installation hole of the rain rail.
3. Secure the top fabric and rain rail with the rivet.



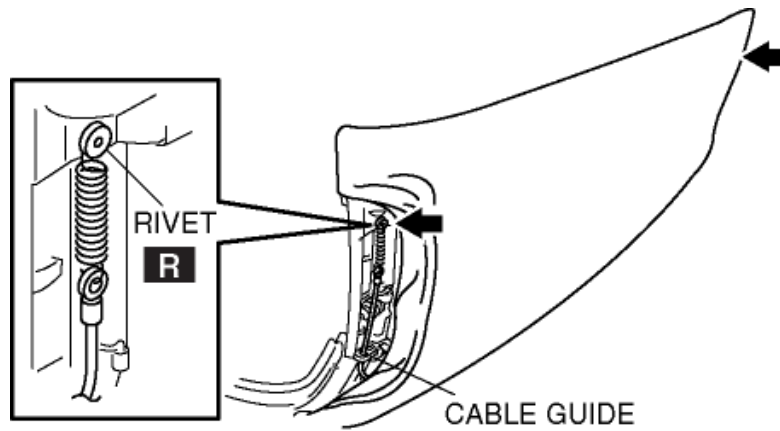
4. Flatten the stem using hammer.

### Top Fabric Assembly Note

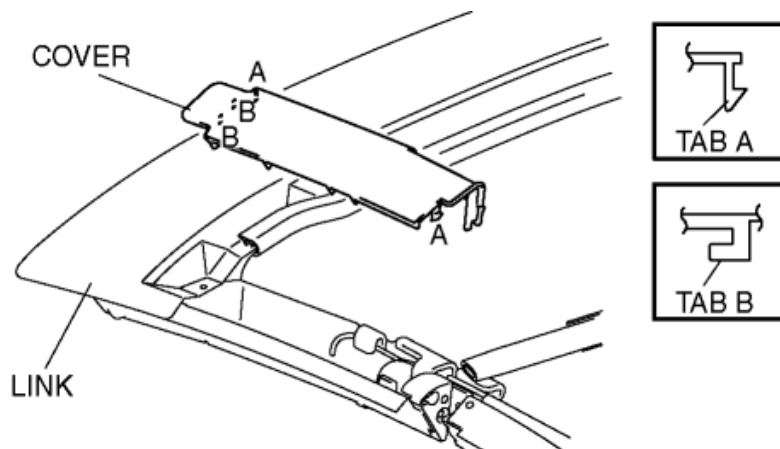
1. Place the link onto the top fabric.
2. Align the link with the set plate installation hole of the top fabric, and install the top fabric to the front header.



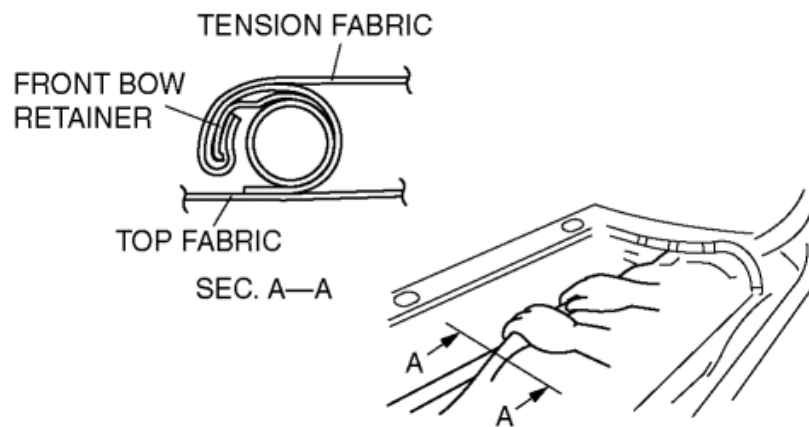
3. Thread the cable into the cable guide.



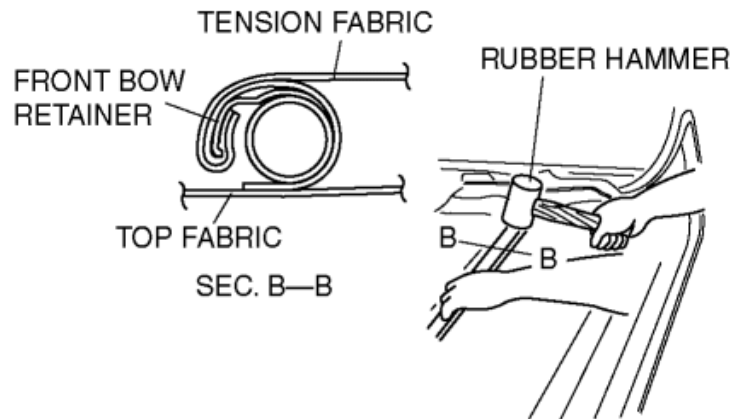
4. Set the aluminum rivet to the riveter, and then secure the cable to the link with the rivet.
5. Install the covers.



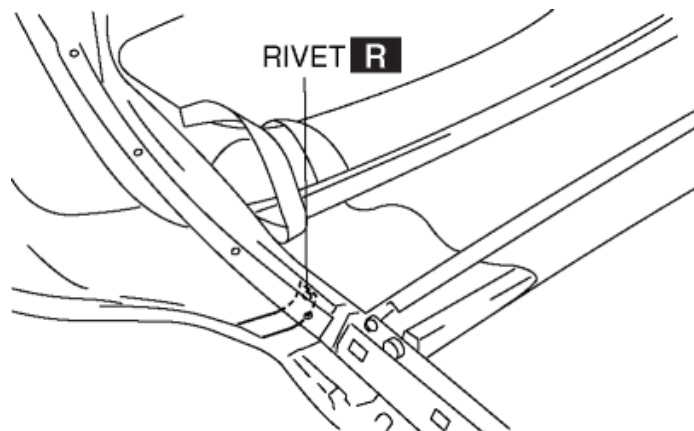
6. Install the top fabric to the front bow.



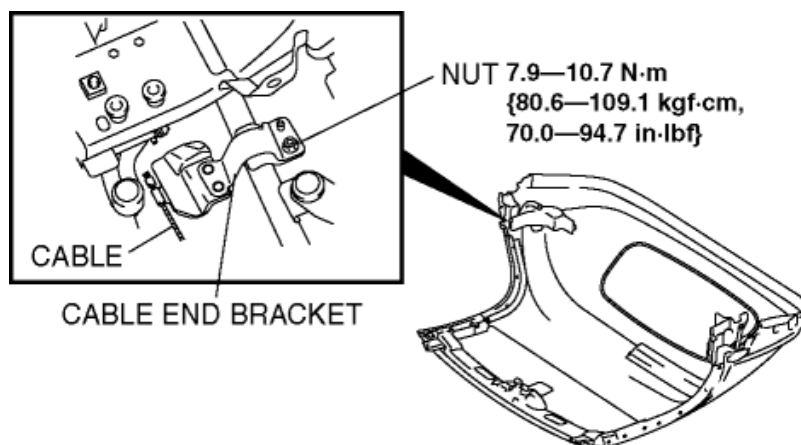
7. Secure the top fabric to the front bow retainer using a rubber hammer.



8. Set the aluminum rivet to the riveter, and then secure the band to the link with the rivet.

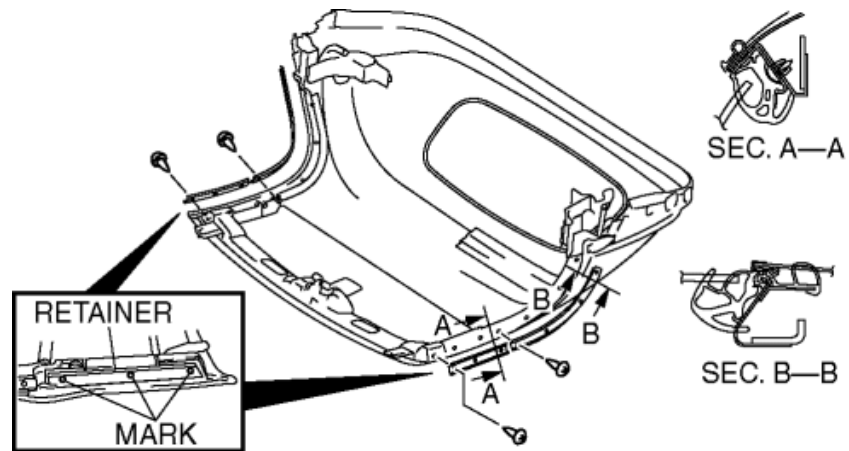


9. Install the cable end bracket.



## Retainer Assembly Note

1. Install the retainers to the link, aligning the retainer marks with the retainer installation screws.



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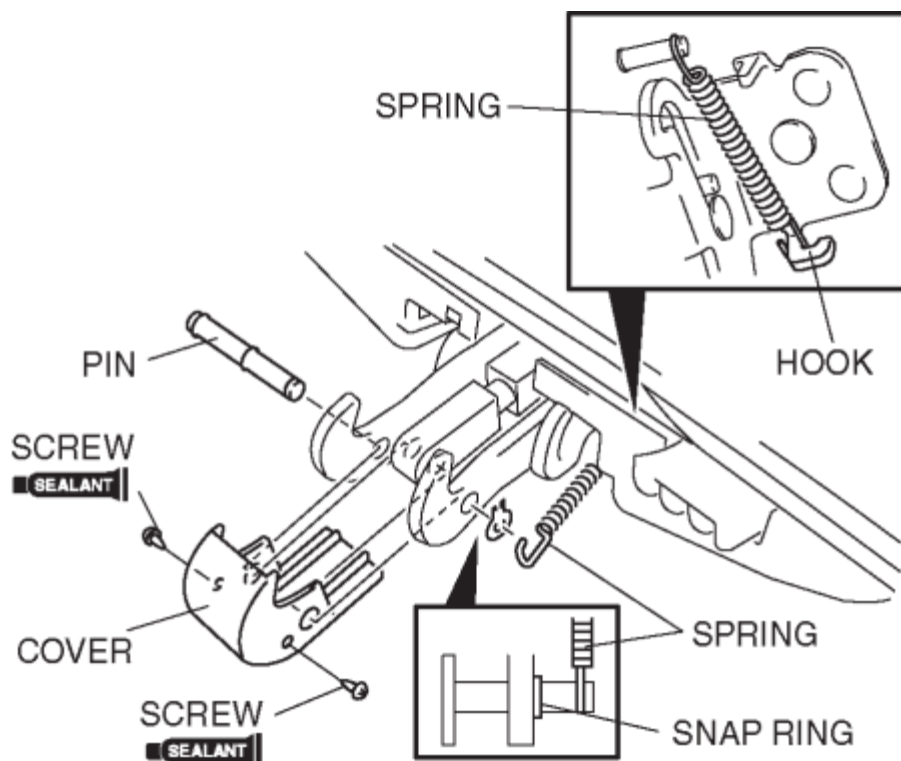
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## 2008 - MX-5 - Body and Accessories

### CONVERTIBLE TOP ADJUSTMENT

1. Remove the spring.

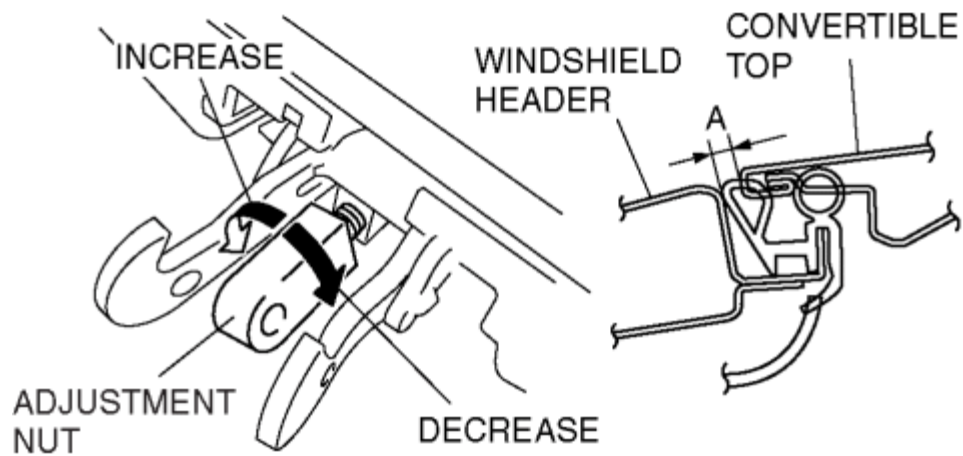


2. Remove the snap ring. (See [Snap Ring Removal Note.](#)) (See [Snap Ring Installation Note.](#))
3. Remove the pin.
4. Remove the screws.
5. Remove the cover.
6. Adjust the clearance of part A by rotating the adjustment nut.

#### NOTE:

- Turn the adjustment nut to the right to narrow the part A clearance, left to widen it.





### Clearance

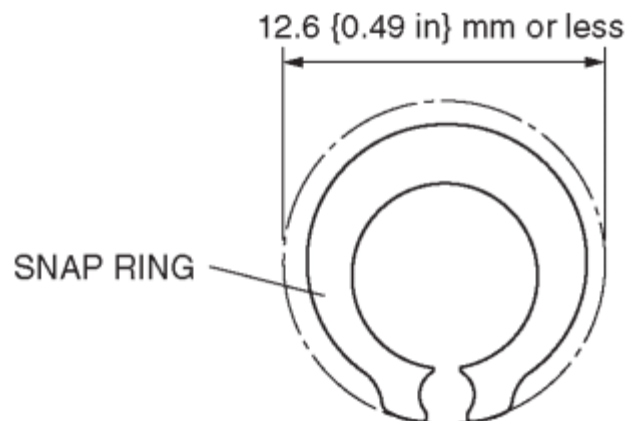
- A: 4—8 mm {0.16—0.31 in}

7. Install in the reverse order of removal.

### Snap Ring Removal Note

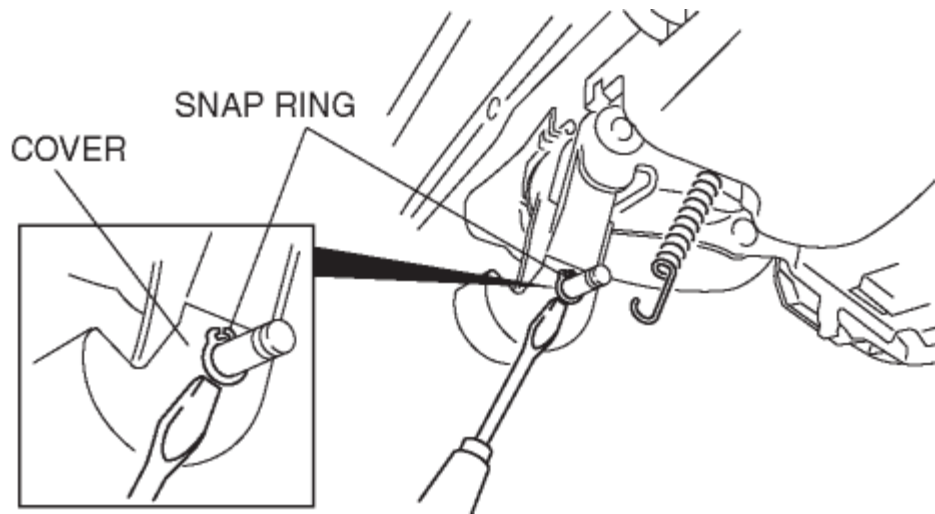
#### CAUTION:

- Remove the snap ring such that the dimension is maintained as indicated in the figure.



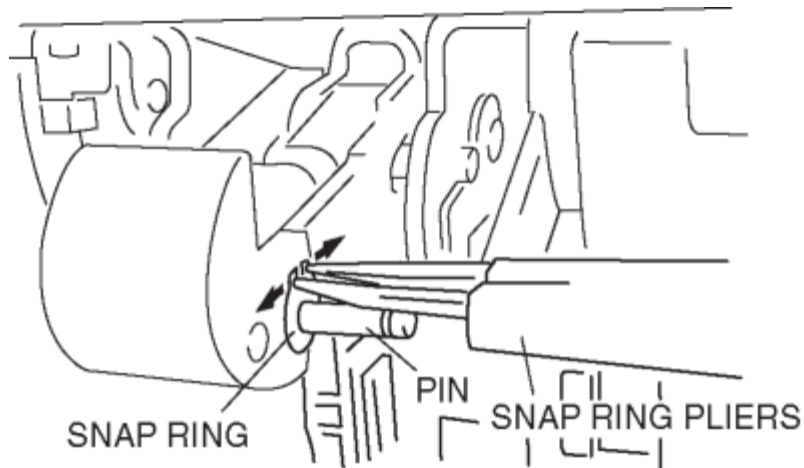
- Because the snap ring is to be reused, remove it carefully so that the ring is not expanded.

1. Insert a tape-wrapped flathead screwdriver between the cover and snap ring, and remove the snap ring by prying along the perimeter so as not to damage the snap ring.



### Snap Ring Installation Note

1. Insert the snap ring to the pin while slightly expanding the snap ring end using snap ring pliers.



2. After securing the snap ring, verify that there is no excessive play between the snap ring and pin.

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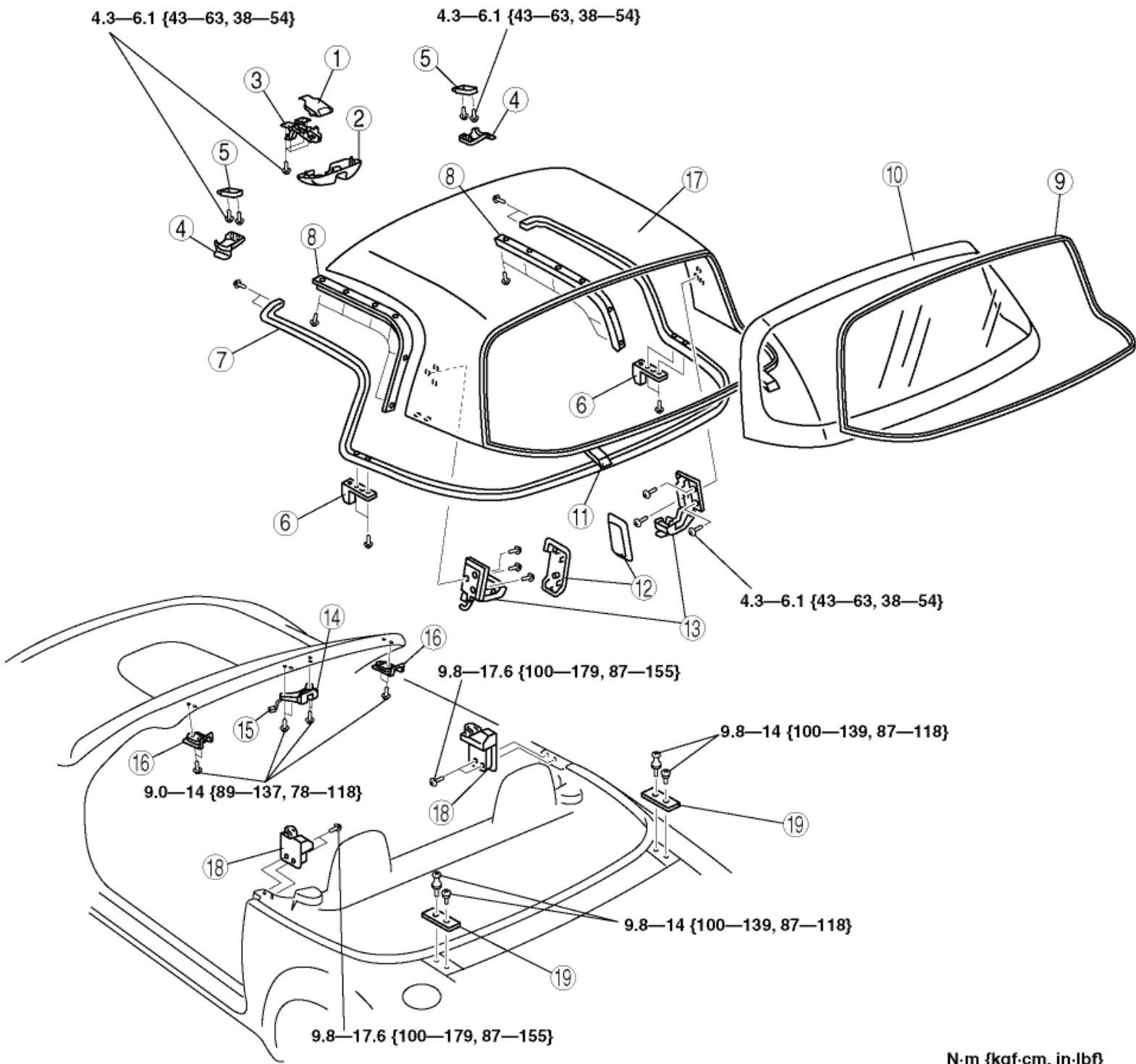
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## 2008 - MX-5 - Body and Accessories

### DETACHABLE HARDTOP DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.
2. To remove the striker, remove the following parts:
  - a. Female wedge (See [CONVERTIBLE TOP DISASSEMBLY/ASSEMBLY.](#))
  - b. Map light (See [MAP LIGHT REMOVAL/INSTALLATION.](#))
  - c. A-pillar trim (See [A-PILLAR TRIM REMOVAL/INSTALLATION.](#))
  - d. Front header trim (See [FRONT HEADER TRIM REMOVAL/INSTALLATION.](#))
3. Assemble in the reverse order of disassembly.



1 Top lock lever cover

2 Top lock cover

3 Top lock

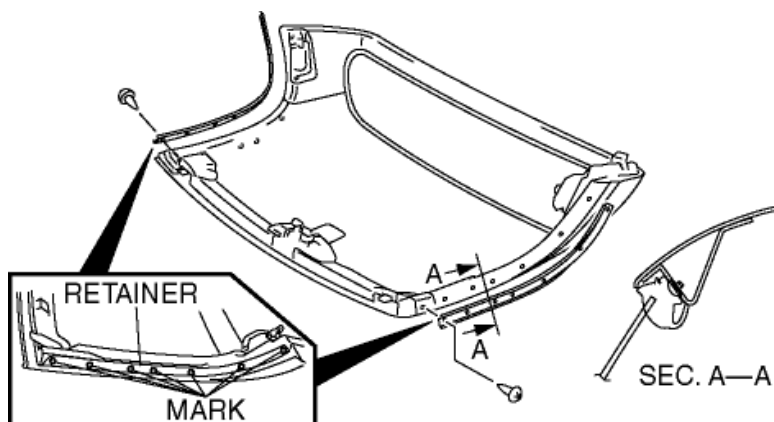
4 male wedge cover

5 male wedge

6	Weatherstrip No.2
7	Weatherstrip No.1
8	Retainer (See <a href="#">Retainer Disassembly Note.</a> ) (See <a href="#">Retainer Assembly Note.</a> )
9	Rear window molding (See <a href="#">REAR WINDOW GLASS REMOVAL [DETACHABLE HARDTOP].</a> ) (See <a href="#">REAR WINDOW GLASS INSTALLATION [DETACHABLE HARDTOP].</a> )
10	Rear window glass (See <a href="#">REAR WINDOW GLASS REMOVAL [DETACHABLE HARDTOP].</a> ) (See <a href="#">REAR WINDOW GLASS INSTALLATION [DETACHABLE HARDTOP].</a> )
11	Rear deck lock
12	B-pillar garnish
13	Side lock
14	Striker
15	Connector
16	Female wedge
17	Detachable hardtop
18	side striker
19	Rear deck plate

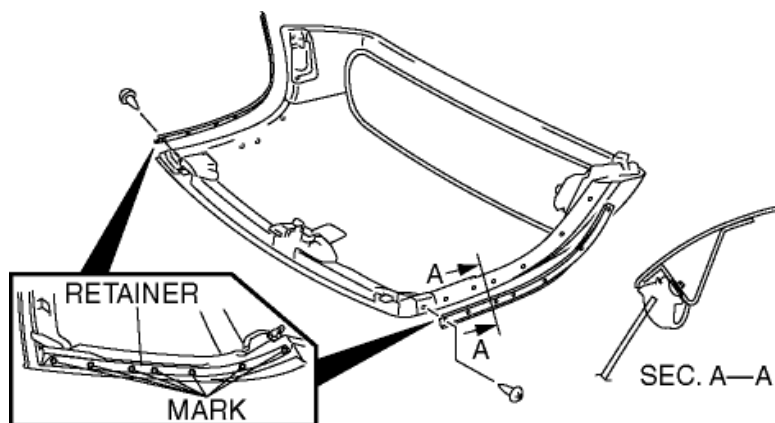
### Retainer Disassembly Note

1. Mark around the retainer installation screws with paint before removing them.



## Retainer Assembly Note

1. Install the retainers to the link, aligning the retainer marks with the retainer installation screws.



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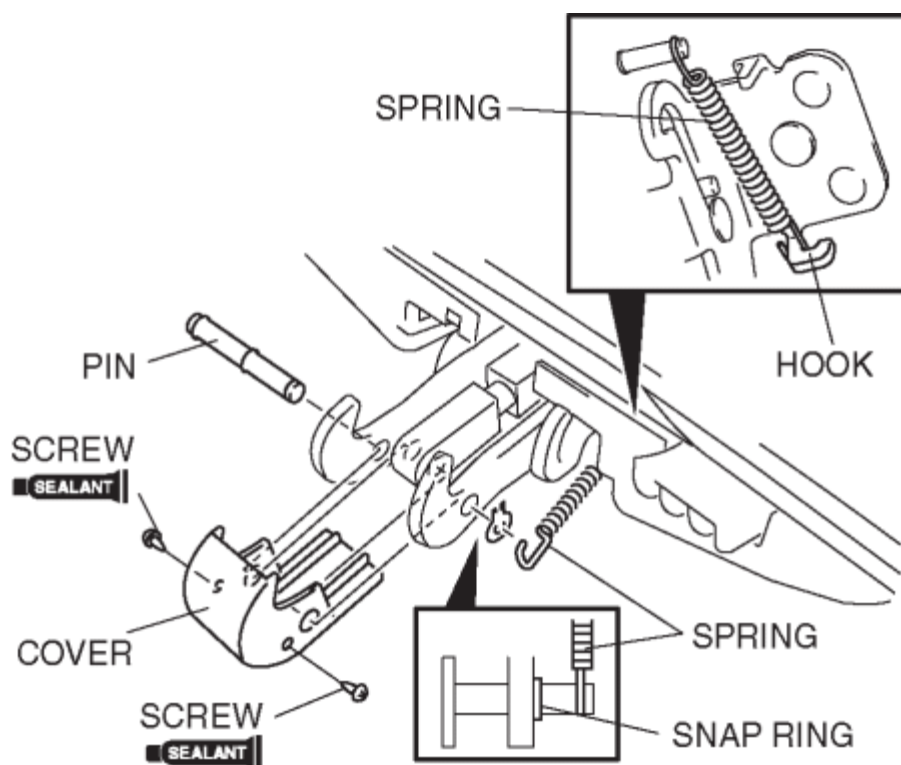
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## 2008 - MX-5 - Body and Accessories

### DETACHABLE HARDTOP ADJUSTMENT

#### Top Lock

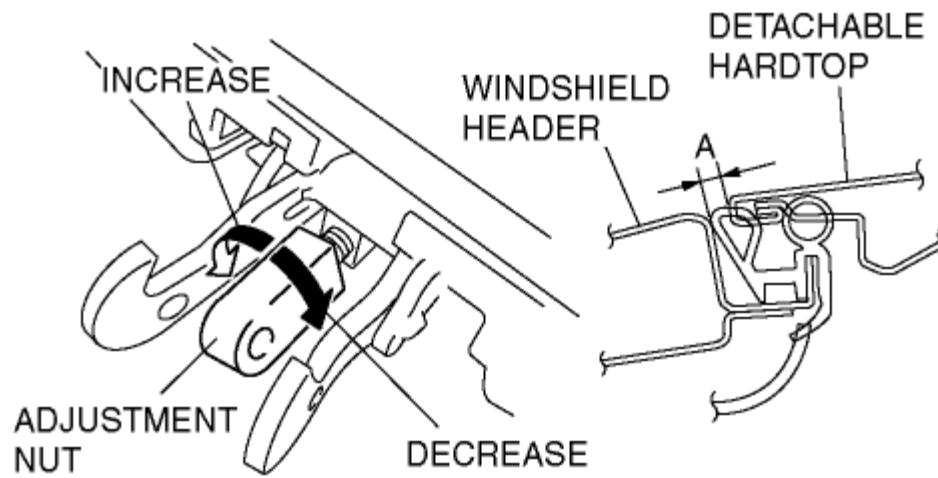
1. Remove the spring.



2. Remove the snap ring. (See [Snap ring removal note.](#)) (See [Snap ring installation note.](#))
3. Remove the pin.
4. Remove the screws.
5. Remove the cover.
6. Adjust the clearance of part A by rotating the adjustment nut.

#### NOTE:

- Turn the adjustment nut to the right to narrow the part A clearance, left to widen it.



### Clearance

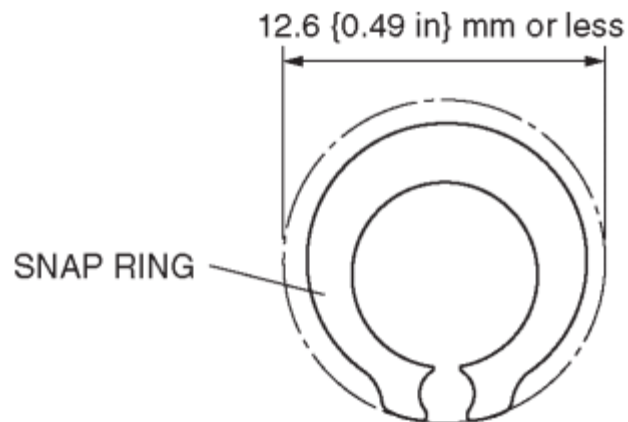
- A: 4—8 mm {0.16—0.31 in}

7. Install in the reverse order of removal.

### Snap ring removal note

#### CAUTION:

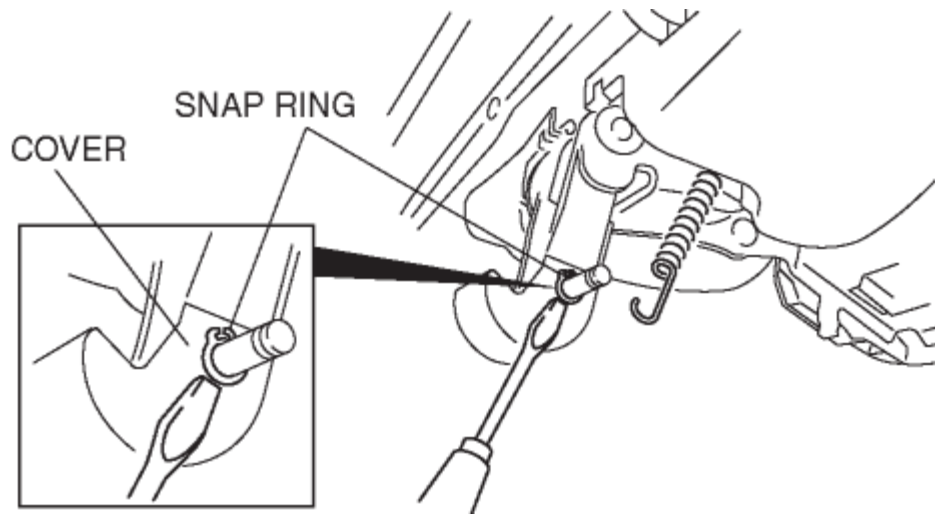
- Remove the snap ring such that the dimension is maintained as indicated in the figure.



- Because the snap ring is to be reused, remove it carefully so that the ring is not expanded.

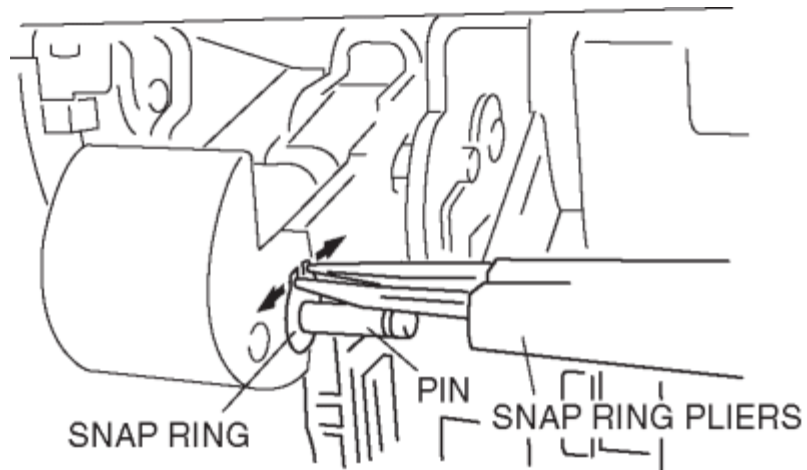
1. Insert a tape-wrapped flathead screwdriver between the cover and snap ring, and remove the snap ring by prying along the perimeter so as not to damage the snap ring.





#### **Snap ring installation note**

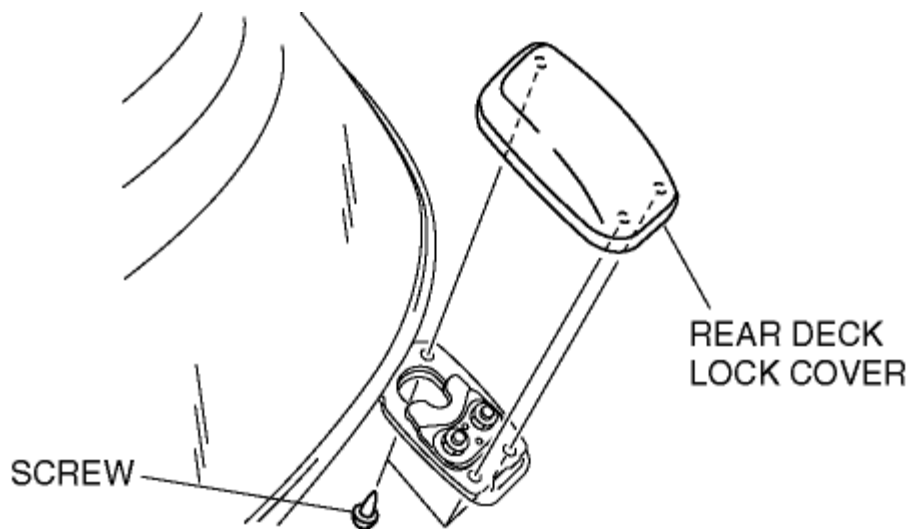
1. Insert the snap ring to the pin while slightly expanding the snap ring end using snap ring pliers.



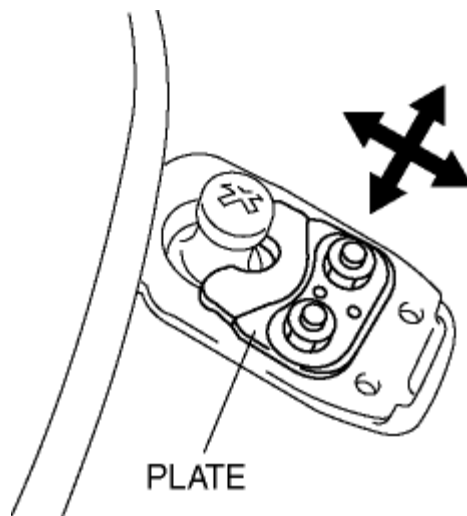
2. After securing the snap ring, verify that there is no excessive play between the snap ring and pin.

#### **Rear Deck Lock**

1. Remove the screw.



2. Remove the rear deck lock cover.
3. Loosen the plate installation bolts.
4. Install the detachable hardtop to the body.
5. Move the plate right, left, fore, or aft until it is tight.



6. Tighten the plate installation bolts.

#### **Tightening torque**

- 17.7—26.4 N·m {1.8—2.6 kgf·m, 13.1—19.4 ft·lbf}

7. Install the rear deck lock cover.

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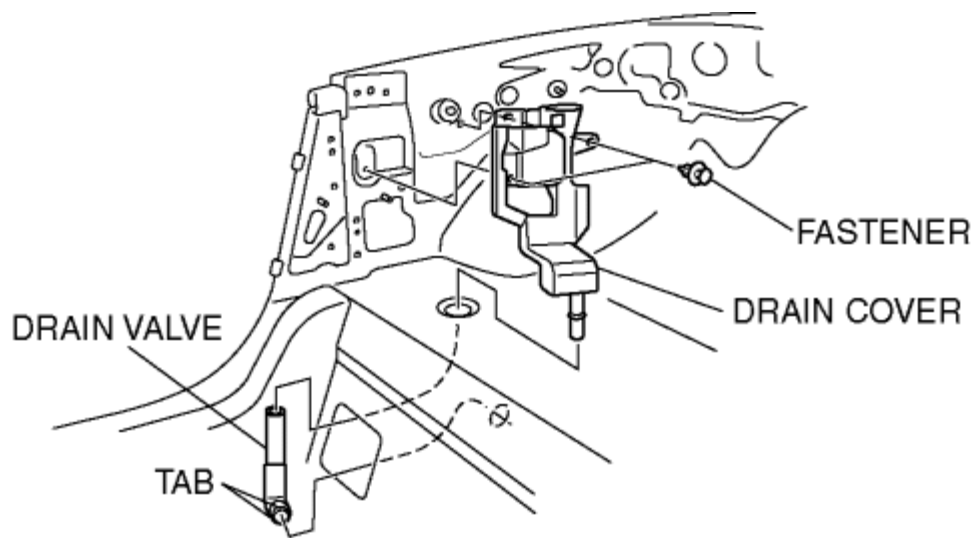
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## 2008 - MX-5 - Body and Accessories

### DRAIN COVER REMOVAL/INSTALLATION

#### Except Power Retractable Hardtop

1. Remove the following parts:
  - a. Console (See [CONSOLE REMOVAL/INSTALLATION.](#))
  - b. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION.](#))
  - c. Scuff plate ([SCUFF PLATE REMOVAL/INSTALLATION.](#))
  - d. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION.](#))
  - e. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION.](#))
  - f. Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION.](#))
  - g. Back trim (See [BACK TRIM REMOVAL/INSTALLATION.](#))
  - h. Seat belt set plate (See [SEAT BELT REMOVAL/INSTALLATION.](#))
  - i. Seat back crossmember assembly (See [SEAT BACK CROSSMEMBER ASSEMBLY REMOVAL/INSTALLATION.](#))
  - j. Rear side trim (See [REAR SIDE TRIM REMOVAL/INSTALLATION.](#))
  - k. Rear package trim (See [REAR PACKAGE TRIM REMOVAL/INSTALLATION.](#))
  - l. Side shelf (See [SIDE SHELF REMOVAL/INSTALLATION.](#))
  - m. Seat belt upper anchor installation bolt (See [SEAT BELT REMOVAL/INSTALLATION.](#))
  - n. Convertible top (See [CONVERTIBLE TOP REMOVAL/INSTALLATION.](#))
  - o. Beltline protector (See [BELTLINE MOLDING REMOVAL/INSTALLATION.](#))
  - p. Retractor screen (See [SEAT BELT REMOVAL/INSTALLATION.](#))
2. Remove the fasteners.



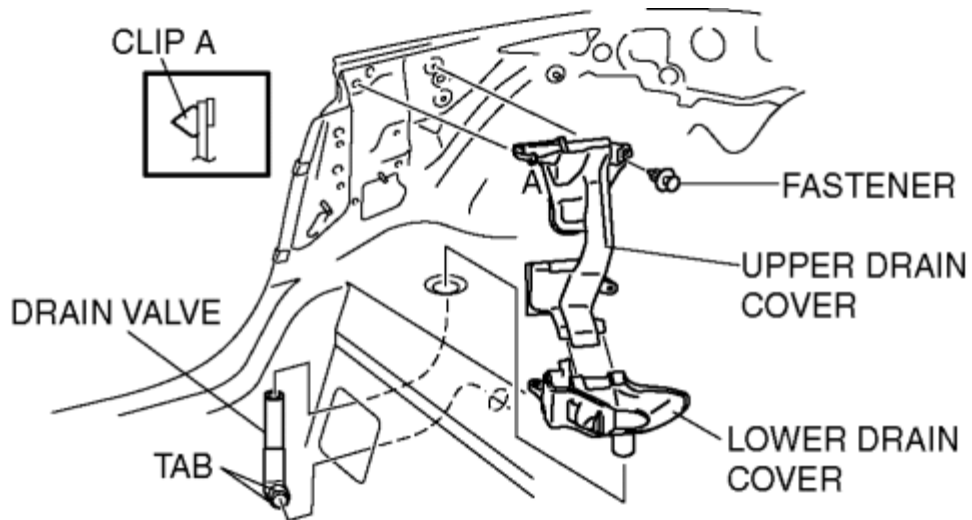
3. Pull the drain cover upward and detach from the drain valve.
4. Remove the drain cover.
5. Detach the tabs of the drain valve from below the vehicle.
6. Remove the drain valve.
7. Install in the reverse order of removal.

## Power Retractable hardtop

1. Fully open the deck panel.
2. Remove the following parts:
  - a. Console (See [CONSOLE REMOVAL/INSTALLATION.](#))
  - b. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION.](#))
  - c. Scuff plate ([SCUFF PLATE REMOVAL/INSTALLATION.](#))
  - d. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION.](#))
  - e. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION.](#))
  - f. Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION.](#))
  - g. Back trim (See [BACK TRIM REMOVAL/INSTALLATION.](#))
  - h. Seat belt upper anchor installation bolt (See [SEAT BELT REMOVAL/INSTALLATION.](#))
  - i. Seat belt set plate (See [SEAT BELT REMOVAL/INSTALLATION.](#))
  - j. Rear side trim (See [REAR SIDE TRIM REMOVAL/INSTALLATION.](#))
  - k. Side shelf (See [SIDE SHELF REMOVAL/INSTALLATION.](#))
  - l. Power retractable hardtop link bracket (See [POWER RETRACTABLE HARDTOP LINK BRACKET REMOVAL/INSTALLATION.](#))
  - m. Cab-side weatherstrip (See [CONVERTIBLE TOP DISASSEMBLY/ASSEMBLY.](#))

n. Power retractable hardtop (See **POWER RETRACTABLE HARDTOP REMOVAL/INSTALLATION.**)

3. Remove the fastener and clip A.



4. Pull the drain cover upward and detach from the drain valve.

5. Remove the upper drain cover and lower drain cover.

6. Detach the tabs of the drain valve from below the vehicle.

7. Remove the drain valve.

8. Install in the reverse order of removal.

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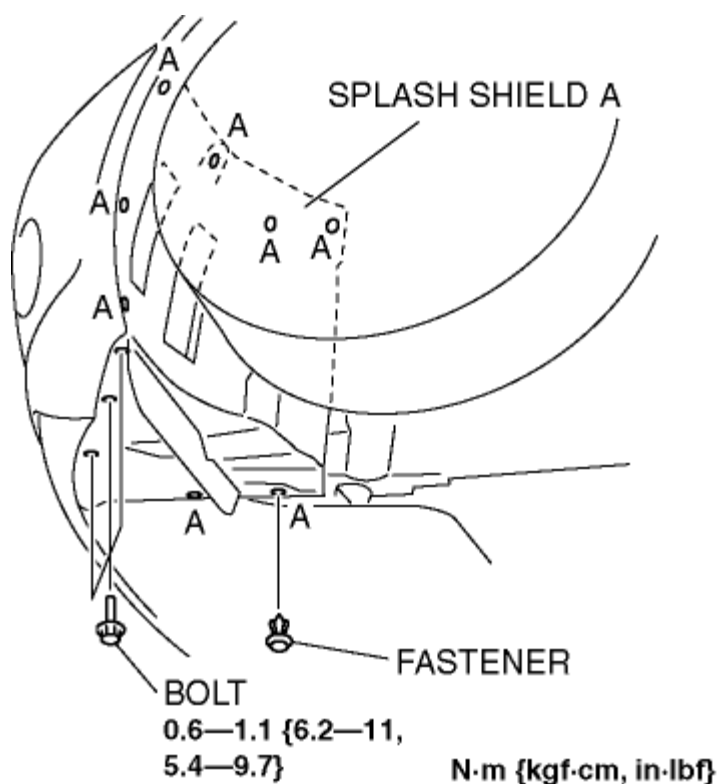
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## 2008 - MX-5 - Body and Accessories

### SPLASH SHIELD REMOVAL/INSTALLATION

#### Splash Shield A

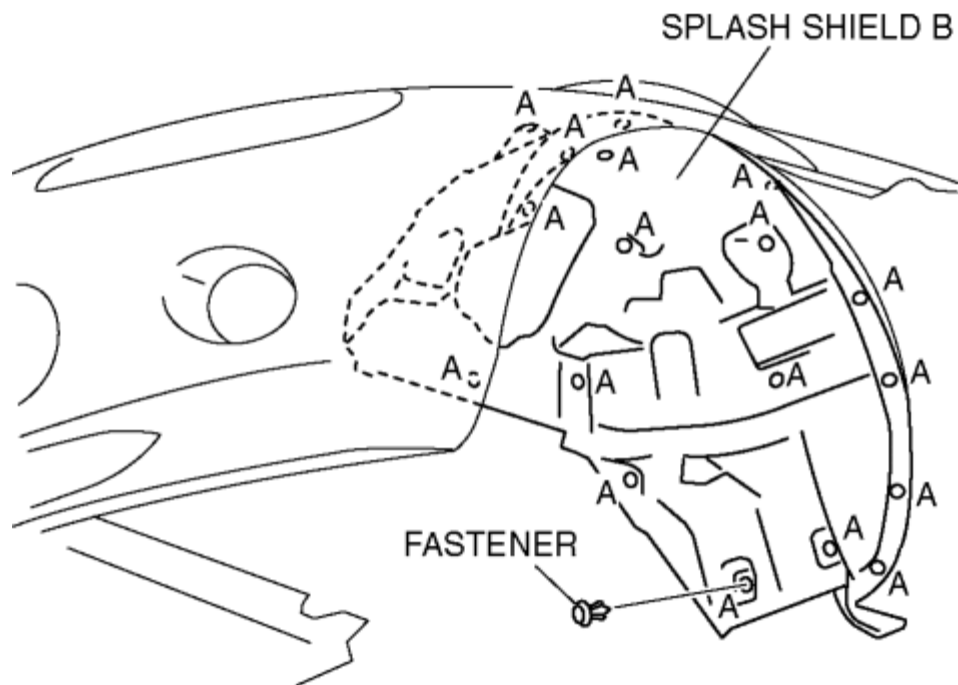
1. Remove the bolts.



2. Remove the fasteners at section A shown in the figure.
3. Install in the reverse order of removal.

#### Splash Shield B

1. Remove the front suspension tower bar. (See [FRONT SUSPENSION TOWER BAR REMOVAL/INSTALLATION.](#))
2. Remove the splash shield A. (See [Splash Shield A.](#))
3. Remove the front shock absorber and coil spring. (See [FRONT SHOCK ABSORBER AND COIL SPRING REMOVAL/INSTALLATION.](#))
4. Remove the fasteners at section A shown in the figure.
5. Remove the splash shield B.



6. Install in the reverse order of removal.

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### POWER RETRACTABLE HARDTOP REMOVAL/INSTALLATION

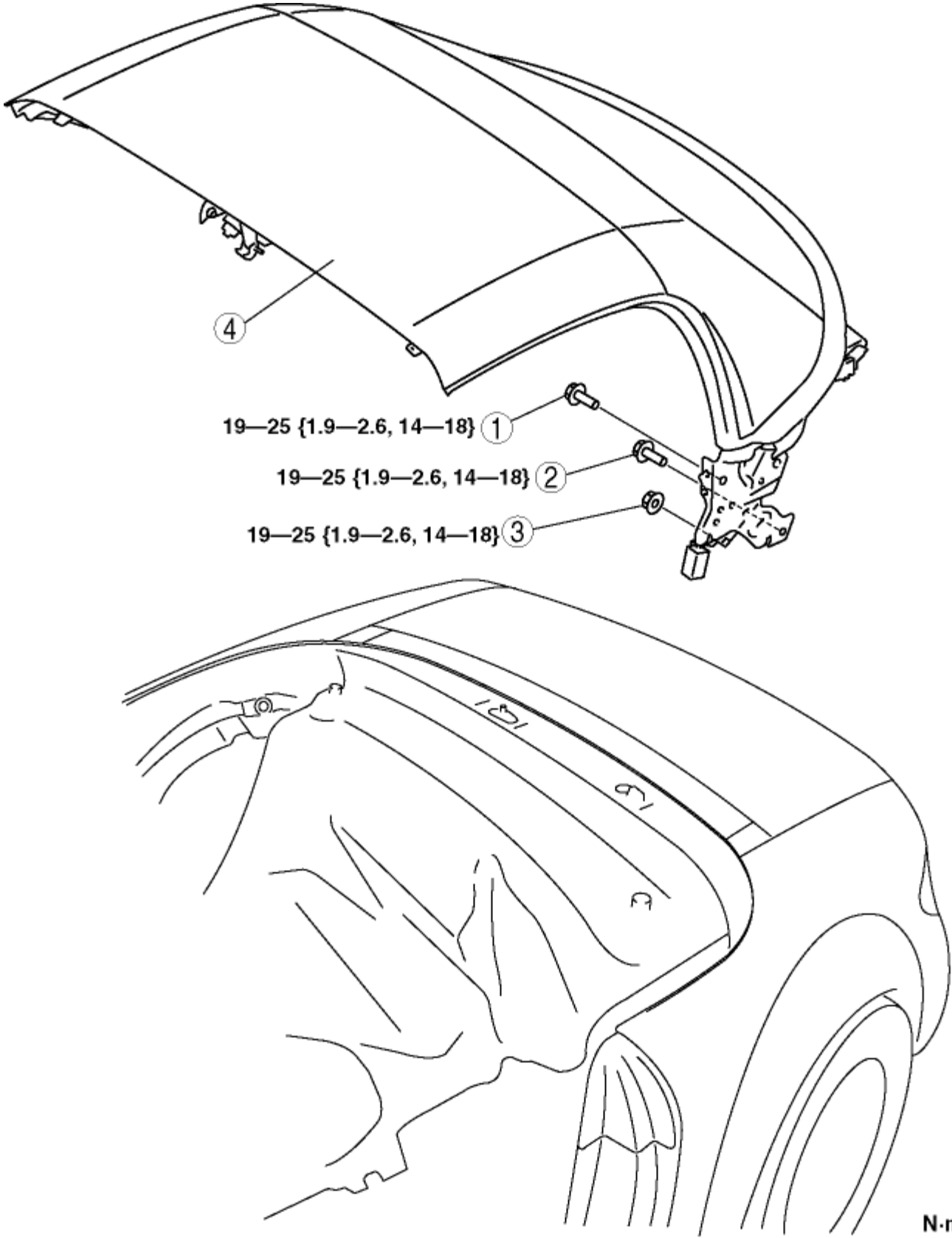
#### CAUTION:

- If the deck panel does not operate electrically, see "DECK PANEL MANUAL OPEN/CLOSE PROCEDURE" to open/close the deck panel. (See [DECK PANEL MANUAL OPEN/CLOSE PROCEDURE](#).)

1. Unlock the top lock.
2. Fully open the deck panel.
3. Cover both sides of the rear window glass with thick cloth to protect the window.
4. Remove the battery cover.
5. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
6. Remove the following parts:
  - a. Console (See [CONSOLE PANEL REMOVAL/INSTALLATION](#).)
  - b. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION](#).)
  - c. Scuff plate (See [SCUFF PLATE REMOVAL/INSTALLATION](#).)
  - d. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION](#).)
  - e. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION](#).)
  - f. Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION](#).)
  - g. Back trim (See [BACK TRIM REMOVAL/INSTALLATION](#).)
  - h. Seat belt upper anchor installation bolt (See [SEAT BELT REMOVAL/INSTALLATION](#).)
  - i. Power retractable hardtop link bracket (See [POWER RETRACTABLE HARDTOP LINK BRACKET REMOVAL/INSTALLATION](#).)
  - j. Rear side trim (See [REAR SIDE TRIM REMOVAL/INSTALLATION](#).)
  - k. Cab-side weatherstrip (See [CONVERTIBLE TOP DISASSEMBLY/ASSEMBLY](#).)
7. Disconnect the roof motor connectors.
8. Disconnect the rear window defroster connector.
9. Disconnect the roof motor limit switch connector.
10. Disconnect the power retractable hardtop drain hose. (See [POWER RETRACTABLE HARDTOP DRAIN HOSE REMOVAL/INSTALLATION](#).)
11. Remove in the order indicated in the table.



12. Install in the reverse order of removal.



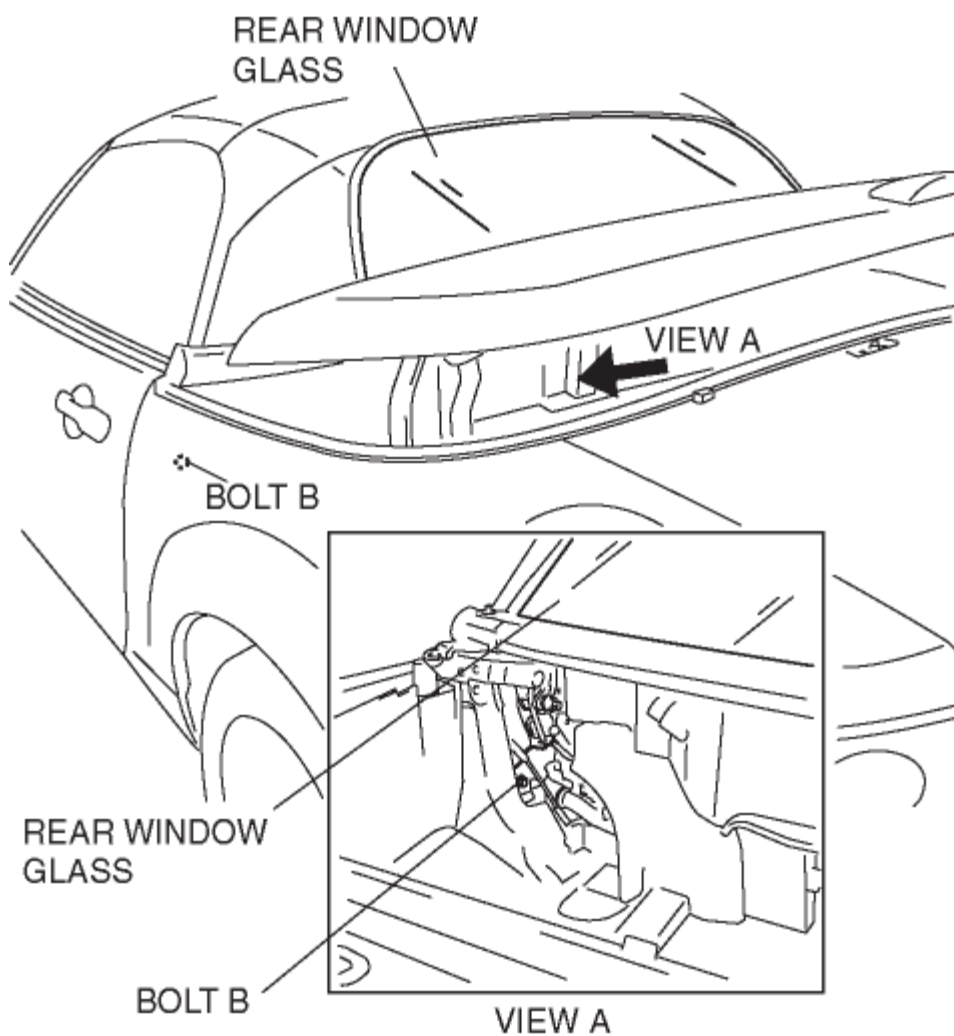
N·m {kgf·m, ft·lbf}

1 Bolt A

2	Bolt B (See <a href="#">Bolt B Removal/Installation Note.</a> )
3	Nut
4	Power retractable hardtop (See <a href="#">Power Retractable hardtop Installation Note.</a> )

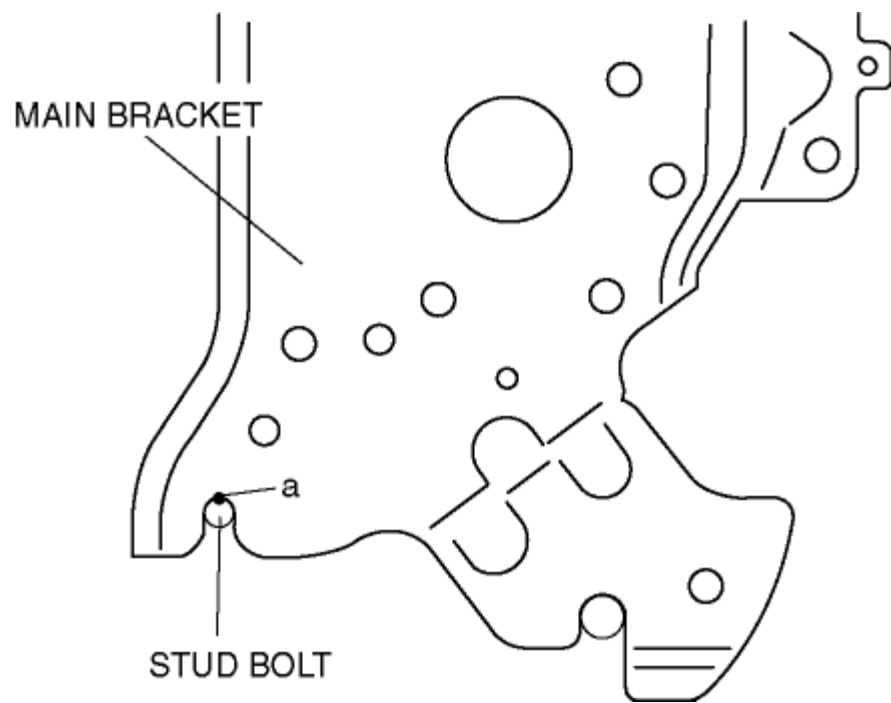
### Bolt B Removal/Installation Note

1. Remove or install bolt B shown in the figure by inserting a hand from the deck panel opening.



### Power Retractable hardtop Installation Note

1. Place the main bracket on the stud bolt so that the power retractable hardtop top lock is locked.
2. Install the power retractable hardtop without any gap (a) between the positioning surface of the main bracket and stud bolt, and tighten the bolt and nut.



**Tightening torque**

- 19—25 N·m { 1.9—2.6 kgf·m, 14—18 ft·lbf }

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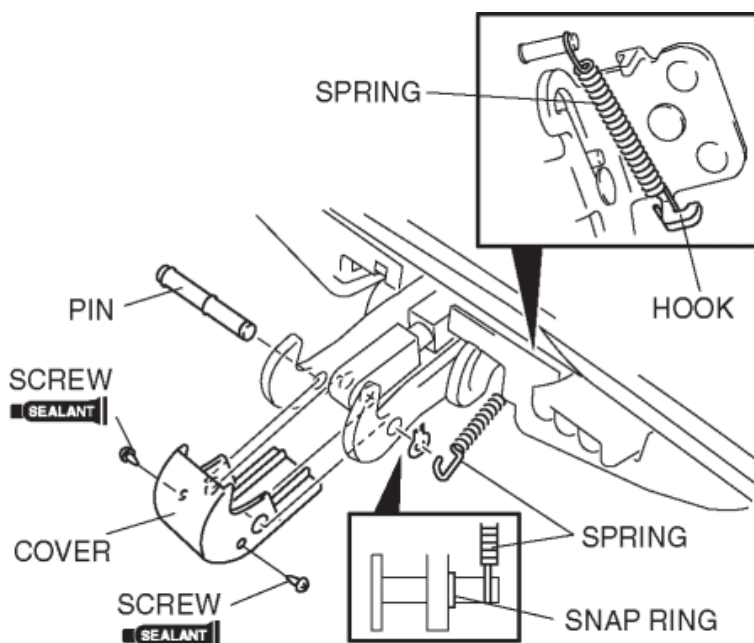
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## 2008 - MX-5 - Body and Accessories

### POWER RETRACTABLE HARDTOP ADJUSTMENT

#### Top Lock

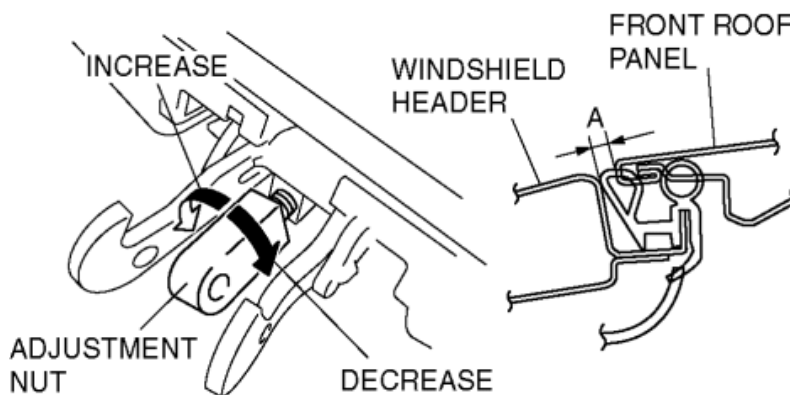
1. Remove the spring.



2. Remove the snap ring. (See [Snap ring removal note.](#)) (See [Snap ring installation note.](#))
3. Remove the pin.
4. Remove the screws.
5. Remove the cover.
6. Adjust the clearance of part A by rotating the adjustment nut.

#### NOTE:

- Turn the adjustment nut to the right to narrow the part A clearance, left to widen it.



Clearance

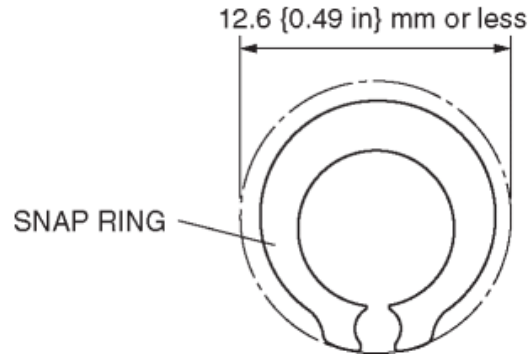
- A: 4—8 mm {0.16—0.31 in}

7. Install in the reverse order of removal.

#### Snap ring removal note

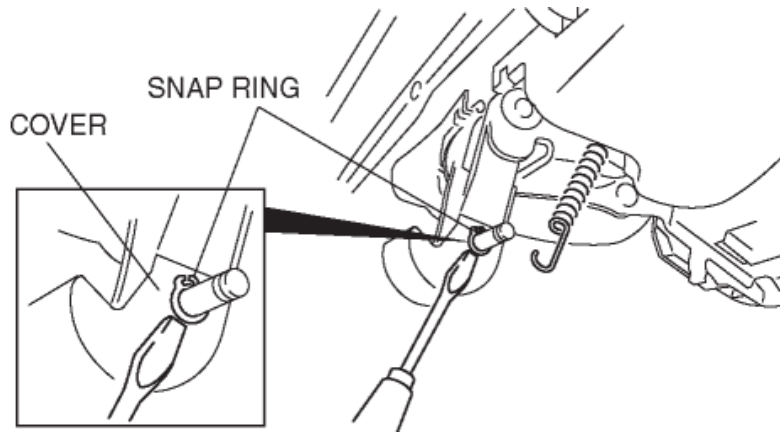
#### CAUTION:

- Remove the snap ring such that the dimension is maintained as indicated in the figure.



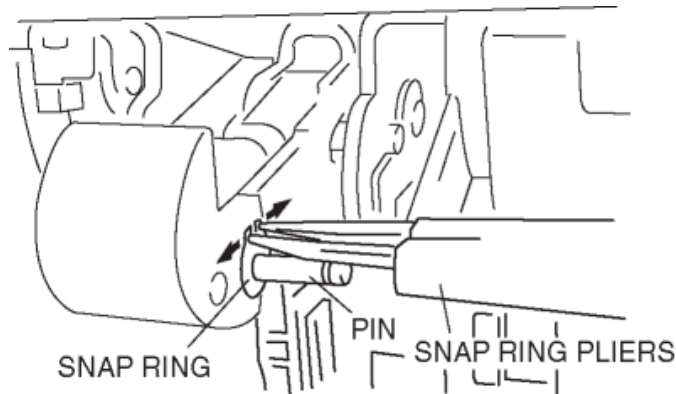
- Because the snap ring is to be reused, remove it carefully so that the ring is not expanded.

1. Insert a tape-wrapped flathead screwdriver between the cover and snap ring, and remove the snap ring by prying along the perimeter so as not to damage the snap ring.



#### Snap ring installation note

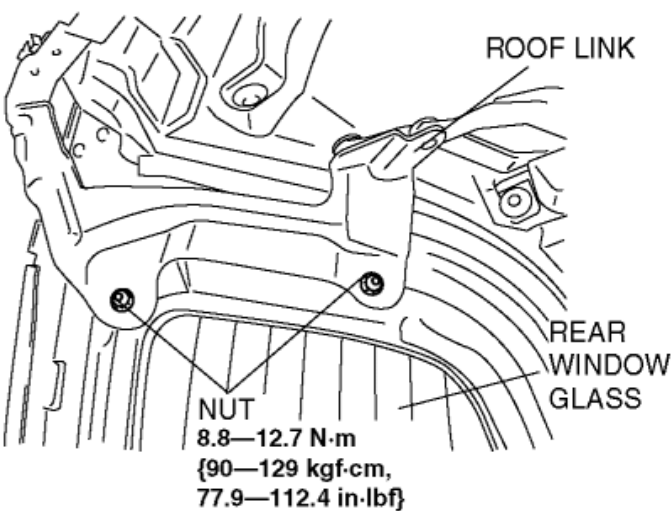
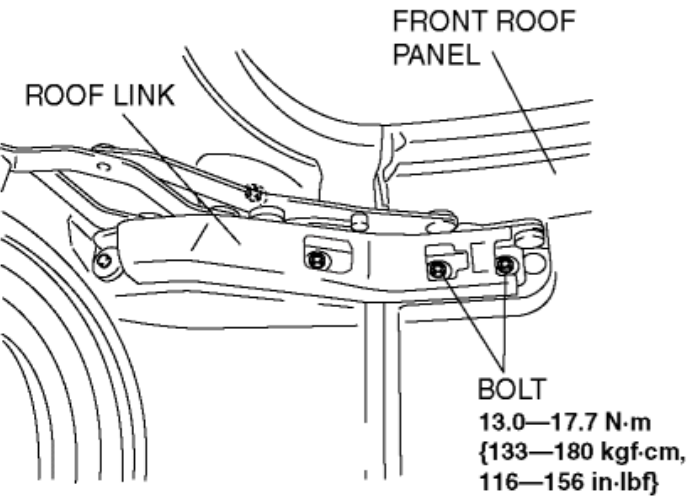
1. Insert the snap ring to the pin while slightly expanding the snap ring end using snap ring pliers.



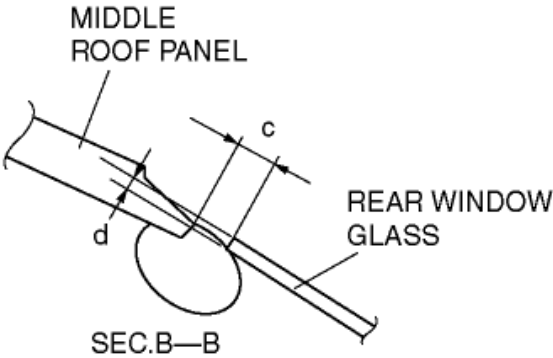
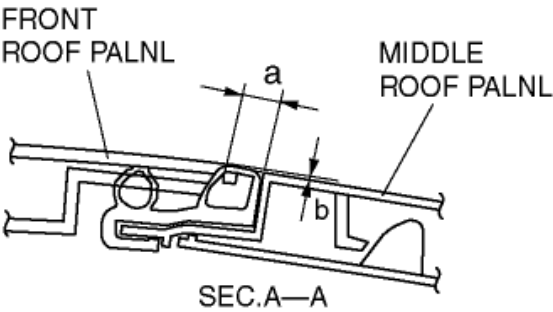
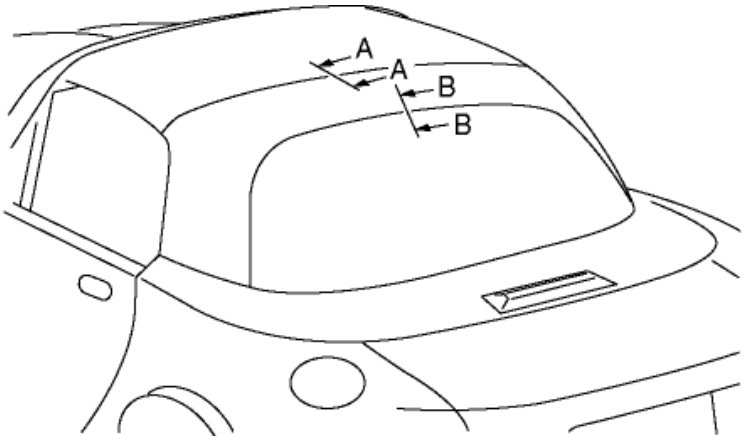
2. After securing the snap ring, verify that there is no excessive play between the snap ring and pin.

Power Retractable Hardtop Assembly Adjustment

1. Loosen the installation bolts and nut for each link.



2. Adjust the gap and height difference between the front roof panel and rear window glass within the specification by moving them back and forth, left and right, and by adjusting the number of shims if necessary.



Clearance

- a: 5.0—9.0 mm {0.20—0.35 in}
- b: -2.0—2.0 mm {-0.07—0.07 in}
- c: 5.0—9.0 mm {0.20—0.35 in}
- d: -2.0—2.0 mm {-0.07—0.07 in}

3. Tighten the bolts and nuts.



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### POWER RETRACTABLE HARDTOP SWITCH REMOVAL/INSTALLATION

#### NOTE:

- The power retractable hardtop switch is integrated with the hazard warning switch. (See [HAZARD WARNING SWITCH REMOVAL/INSTALLATION](#).)

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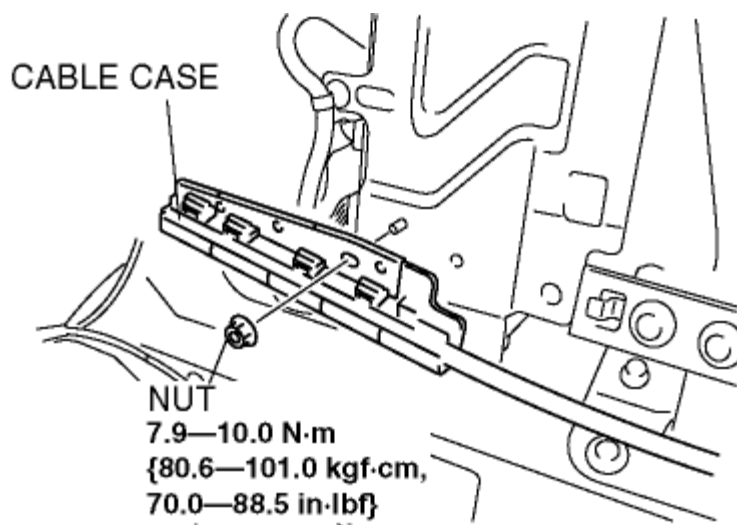
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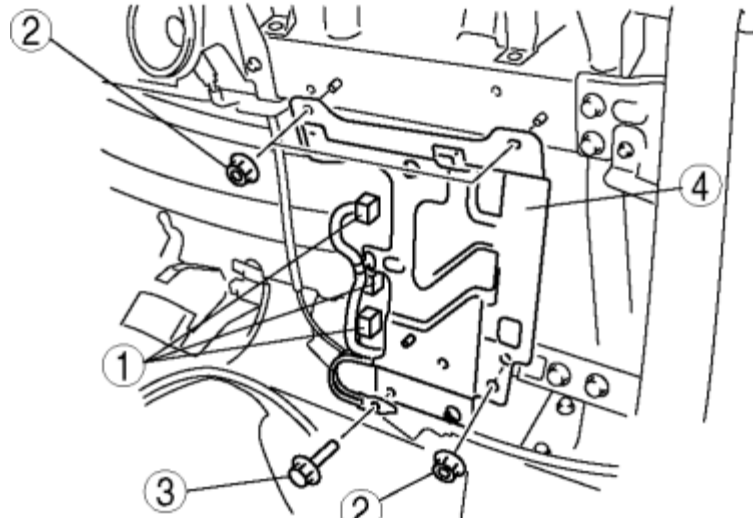
### POWER RETRACTABLE HARDCOMP CONTROL MODULE BRACKET REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the following parts:
  - a. Console (See [CONSOLE REMOVAL/INSTALLATION](#).)
  - b. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION](#).)
  - c. Scuff plate ([SCUFF PLATE REMOVAL/INSTALLATION](#).)
  - d. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION](#).)
  - e. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION](#).)
  - f. Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION](#).)
  - g. Back trim (See [BACK TRIM REMOVAL/INSTALLATION](#).)
4. Remove the roof hook cable case.



5. Remove in the order indicated in the table.

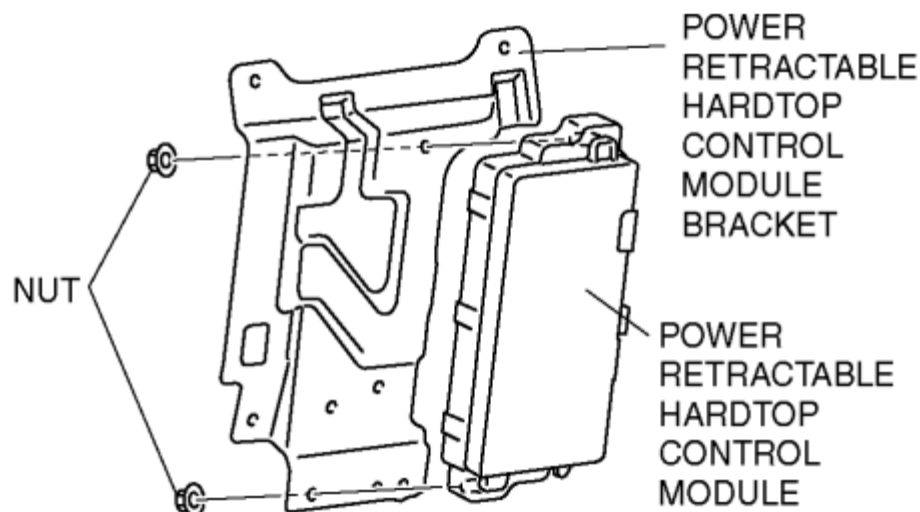
7.9—10.0 N·m  
 {80.6—101.0 kgf·cm,  
 70.0—88.5 in·lbf}



7.9—10.0 N·m  
 {80.6—101.0 kgf·cm,  
 70.0—88.5 in·lbf}

1	Connector
2	Nut
3	Bolt
4	Power retractable hardtop control module assembly

6. Remove the nuts.



7. Remove the power retractable hardtop control module bracket.

8. Install in the reverse order of removal.

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POWER RETRACTABLE HARDTOP CONTROL MODULE INSPECTION

1. Remove the following parts:
- a. Console (See [CONSOLE REMOVAL/INSTALLATION.](#))

b. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION.](#))

c. Scuff plate ([SCUFF PLATE REMOVAL/INSTALLATION.](#))

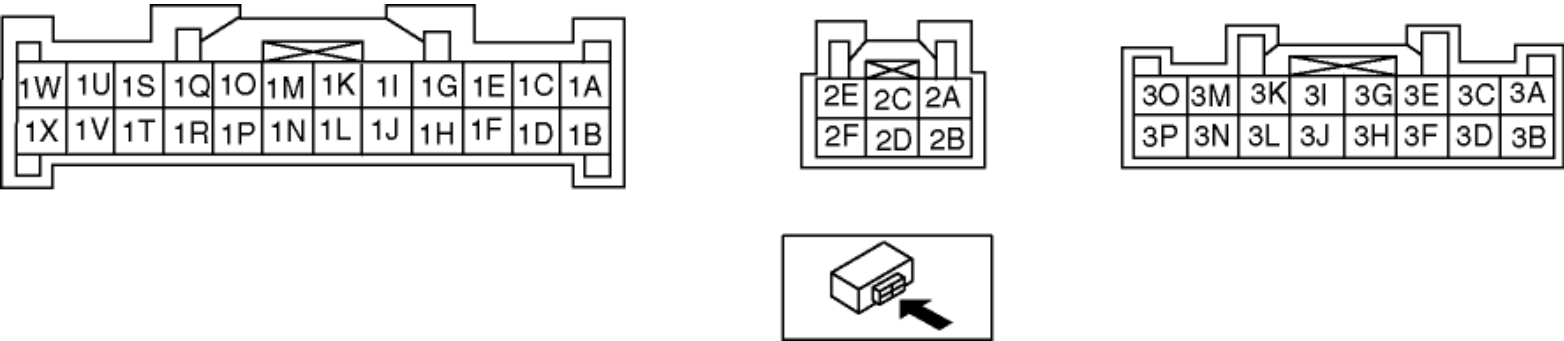
d. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION.](#))

e. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION.](#))

f. Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION.](#))

g. Back trim (See [BACK TRIM REMOVAL/INSTALLATION.](#))
2. Attach the tester lead to the power retractable hardtop control module wiring harness-side connector and inspect voltage, continuity, or resistance according to the standard (reference) on the table.

Standard (Reference)



Terminal	Signal	Connected to	Test condition	Standard	Inspection item
1A	Trunk lid opener relay output signal	Trunk lid opener relay	The deck panel is in the fully closed position.	B+	<div><div>• Deck panel limit switch</div><div>• Trunk lid opener relay</div><div>• Related wiring harness</div></div>
			The deck panel is not in the fully closed position.	1.0 or less	
1B	—	—	—	—	—
					<div>• Power</div>

1C	Power window input signal	Power window main switch	Under any condition: Inspect for continuity to power window main switch.		Continuity detected	window main switch • Related wiring harness
1D	Top lock input signal	Top lock switch	Ignition switch is turned to the ON position	When the top lock is locked.	1.0 or less	• Top lock switch • Related wiring harness
				When the top lock is unlocked.	B+	
1E	Power window full-open request signal (Output)	Power window main switch	Under any condition: Inspect for continuity to power window main switch.		Continuity detected	• Power window main switch • Related wiring harness
1F	Trunk lid latch switch signal	Trunk lid latch switch	When the trunk lid is open.		1.0 or less	• Trunk lid latch switch • Related wiring harness
			When the trunk lid is closed.		B+	
1G	Hall effect sensor power supply	• Roof Motor • Deck panel motor	Ignition switch is turned to the ON position	When the roof panel or deck panel is not moving.	1.0 or less	• Roof Motor • Deck panel Motor • Related wiring harness
				When the roof panel or deck panel is moving.	B+	
1H	Input signal of the roof panel open/close switch	Power retractable hardtop switch (hazard warning switch)	Ignition switch is turned to the ON position	Opening switch on	approx. 2.5	• Power retractable hardtop switch • Related wiring harness
				Closing switch on	approx. 3.4	
				Other	approx. 5.0	
1I	Roof motor hall sensor input signal (RH)	Roof motor (RH)	When the roof is moving.	Pulse is output. (See <a href="#">Inspection using an oscilloscope (reference)</a> .)		• Roof motor (RH) • Related wiring harness
						• ROOM 15

1J	Power supply	ROOM 15 A fuse	Under any condition		B+	<ul style="list-style-type: none"> <li>A fuse</li> <li>Related wiring harness</li> </ul>
1K	Deck panel motor hall sensor input signal (RH)	Deck panel motor (RH)	When the deck panel is moving.	Pulse is output. (See <a href="#">Inspection using an oscilloscope (reference)</a> .)		<ul style="list-style-type: none"> <li>Deck panel motor (RH)</li> <li>Related wiring harness</li> </ul>
1L	—	—	—		—	—
1M	Roof motor hall sensor input signal (LH)	Roof motor (LH)	When the roof is moving.	Pulse is output. (See <a href="#">Inspection using an oscilloscope (reference)</a> .)		<ul style="list-style-type: none"> <li>Roof motor (LH)</li> <li>Related wiring harness</li> </ul>
1N	—	—	—		—	—
1O	Deck panel motor hall sensor input signal (LH)	Deck panel motor (LH)	When the deck panel is moving.	Pulse is output. (See <a href="#">Inspection using an oscilloscope (reference)</a> .)		<ul style="list-style-type: none"> <li>Deck panel motor (LH)</li> <li>Related wiring harness</li> </ul>
1P	—	—	—		—	—
1Q	Hall effect sensor GND	GND	Under any condition: Inspect for continuity to GND.		Continuity detected	<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
1R	Roof close position switch input signal	Power retractable hardtop limit switch	Ignition switch is turned to the ON position	When the roof panel is fully closed.	1.0 or less	<ul style="list-style-type: none"> <li>Power retractable hardtop limit switch</li> <li>Related wiring harness</li> </ul>
				When the roof panel is not fully closed.	B+	
1S	CAN-H	—	Because this terminal is for communication, good/no good judgment by terminal voltage is not possible.		—	<ul style="list-style-type: none"> <li>Related wiring harnesses</li> </ul>
				When the roof panel is fully open.	1.0 or less	<ul style="list-style-type: none"> <li>Power retractable hardtop</li> </ul>

1T	Roof open position switch input signal	Power retractable hardtop limit switch	Ignition switch is turned to the ON position	When the roof panel is not fully open.	B+	limit switch <ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
1U	CAN-L	—	Because this terminal is for communication, good/no good judgment by terminal voltage is not possible.		—	<ul style="list-style-type: none"> <li>Related wiring harnesses</li> </ul>
1V	Signal GND	Power retractable hardtop limit switch/deck panel limit switch	Ignition switch is turned to the ON position	Under any condition	1.0 or less	<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
1W	Signal GND	GND	Under any condition: Inspect for continuity to GND.		Continuity detected	<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
1X	IG1	ENGINE 15 A fuse	IG ON		B+	<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
			When the ignition switch is not in the ON position.		1.0 or less	
2A	Power supply	Main fuse block	Under any condition		B+	<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
2B	Power supply	Main fuse block	Under any condition		B+	<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
2C	Indicator light output signal	Power retractable hardtop Indicator light (hazard warning switch)	Ignition switch is turned to the ON position	Illuminated	1.0 or less	<ul style="list-style-type: none"> <li>Hazard switch</li> <li>Related wiring harness</li> </ul>
				Not illuminated	B+	
2D	—	—	—		—	—
2E	Power GND	GND	Under any condition: Inspect for continuity to GND.		Continuity detected	<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
2F	Power GND	GND	Under any condition: Inspect for continuity to GND.		Continuity detected	<ul style="list-style-type: none"> <li>Related wiring harness</li> </ul>
3A	Roof motor control (open)	Roof motor (RH)	Ignition switch is turned to the ON position	Roof panel open operation	B+	<ul style="list-style-type: none"> <li>Roof motor (RH)</li> <li>Related wiring harness</li> </ul>
				Roof panel close operation	1.0 or less <sup>*1</sup>	

				Other	approx. 2	—
3B	—	—	—	—	—	—
3C	—	—	—	—	—	—
3D	Roof motor control (close)	Roof motor (LH)	Ignition switch is turned to the ON position	Roof panel open operation	1.0 or less <sup>*1</sup>	<ul style="list-style-type: none"> <li>Roof motor (LH)</li> <li>Related wiring harness</li> </ul>
				Roof panel close operation	B+	
				Other	approx. 2	
3E	Deck panel motor control (close)	Deck panel motor (RH)	Ignition switch is turned to the ON position	Deck panel open operation	1.0 or less <sup>*1</sup>	<ul style="list-style-type: none"> <li>Deck panel motor (RH)</li> <li>Related wiring harness</li> </ul>
				Deck panel close operation	B+	
				Other	approx. 2	
3F	Deck panel open position sensor input signal	Deck panel limit switch	Ignition switch is turned to the ON position	When the deck panel is fully open.	1.0 or less	<ul style="list-style-type: none"> <li>Deck panel limit switch</li> <li>Related wiring harness</li> </ul>
				When the deck panel is not fully open.	B+	
3G	—	—	—	—	—	—
3H	Deck panel motor control (open)	Deck panel motor (LH)	Ignition switch is turned to the ON position	Deck panel open operation	B+	<ul style="list-style-type: none"> <li>Deck panel motor (LH)</li> <li>Related wiring harness</li> </ul>
				Deck panel close operation	1.0 or less <sup>*1</sup>	
				Other	approx. 2	
3I	Roof motor control (close)	Roof motor (RH)	Ignition switch is turned to the ON position	Roof panel open operation	1.0 or less <sup>*1</sup>	<ul style="list-style-type: none"> <li>Roof motor (RH)</li> <li>Related wiring harness</li> </ul>
				Roof panel close operation	B+	
				Other	approx. 2	
3J	—	—	—	—	—	—
3K	—	—	—	—	—	—



3L	Roof motor control (open)	Roof motor (LH)	Ignition switch is turned to the ON position	Roof panel open operation	B+	<ul style="list-style-type: none"> <li>Roof motor (LH)</li> <li>Related wiring harness</li> </ul>
				Roof panel close operation	1.0 or less <sup>*1</sup>	
				Other	approx. 2	
3M	Deck panel motor control (open)	Deck panel motor (RH)	Ignition switch is turned to the ON position	Deck panel open operation	B+	<ul style="list-style-type: none"> <li>Deck panel motor (RH)</li> <li>Related wiring harness</li> </ul>
				Deck panel close operation	1.0 or less <sup>*1</sup>	
				Other	approx. 2	
3N	—	—	—	—	—	—
3O	Deck panel close position sensor input signal	Deck panel limit switch	Ignition switch is turned to the ON position	Except closed position	1.0 or less	<ul style="list-style-type: none"> <li>Deck panel limit switch</li> <li>Related wiring harness</li> </ul>
				Closed position	B+	
3P	Deck panel motor control (close)	Deck panel motor (LH)	Ignition switch is turned to the ON position	Deck panel open operation	1.0 or less <sup>*1</sup>	<ul style="list-style-type: none"> <li>Deck panel motor (LH)</li> <li>Related wiring harness</li> </ul>
				Deck panel close operation	B+	
				Other	approx. 2	

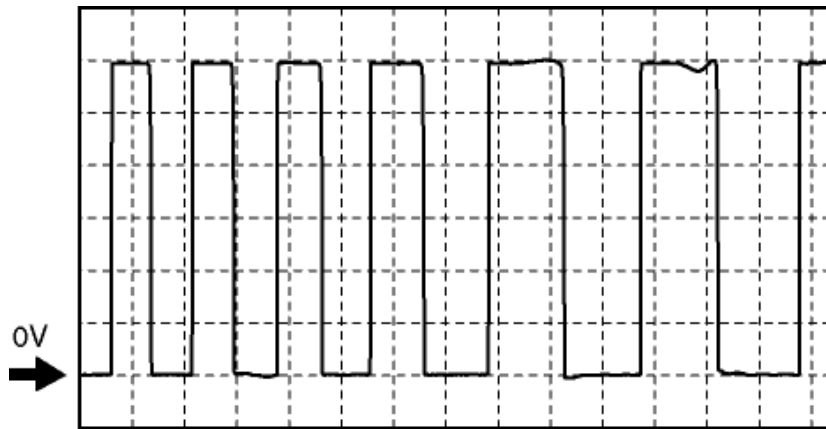
\*1

**The voltage increases during operation speed control of the roof and deck panel.**

#### Inspection using an oscilloscope (reference)

##### Roof motor hall sensor

- Terminal connected: power retractable hardtop control module 1I (RH), 1M (LH) —Negative battery terminal



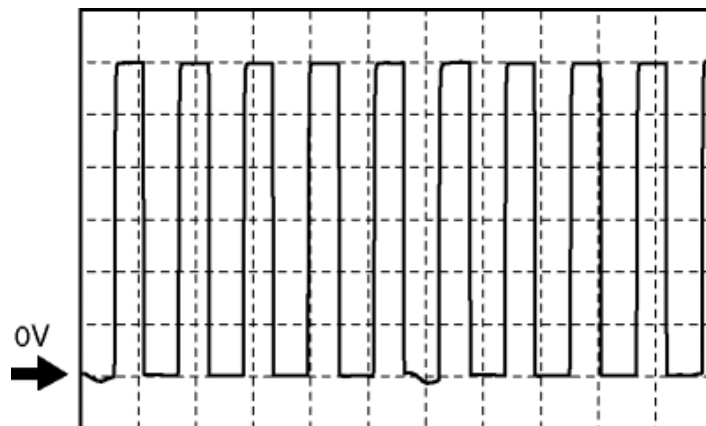
- Oscilloscope setting: 2 V/DIV (Y): 5 ms/DIV (X), DC range
- Measurement condition: When the roof is moving.

**NOTE:**

- Pulse interval varies with the roof operation speed.

**Deck panel motor hall sensor**

- Terminal connected: power retractable hardtop control module 1K (RH), 1O (LH)—Negative battery terminal



- Oscilloscope setting: 2 V/DIV (Y): 5 ms/DIV (X), DC range
- Measurement condition: When the deck panel is moving.

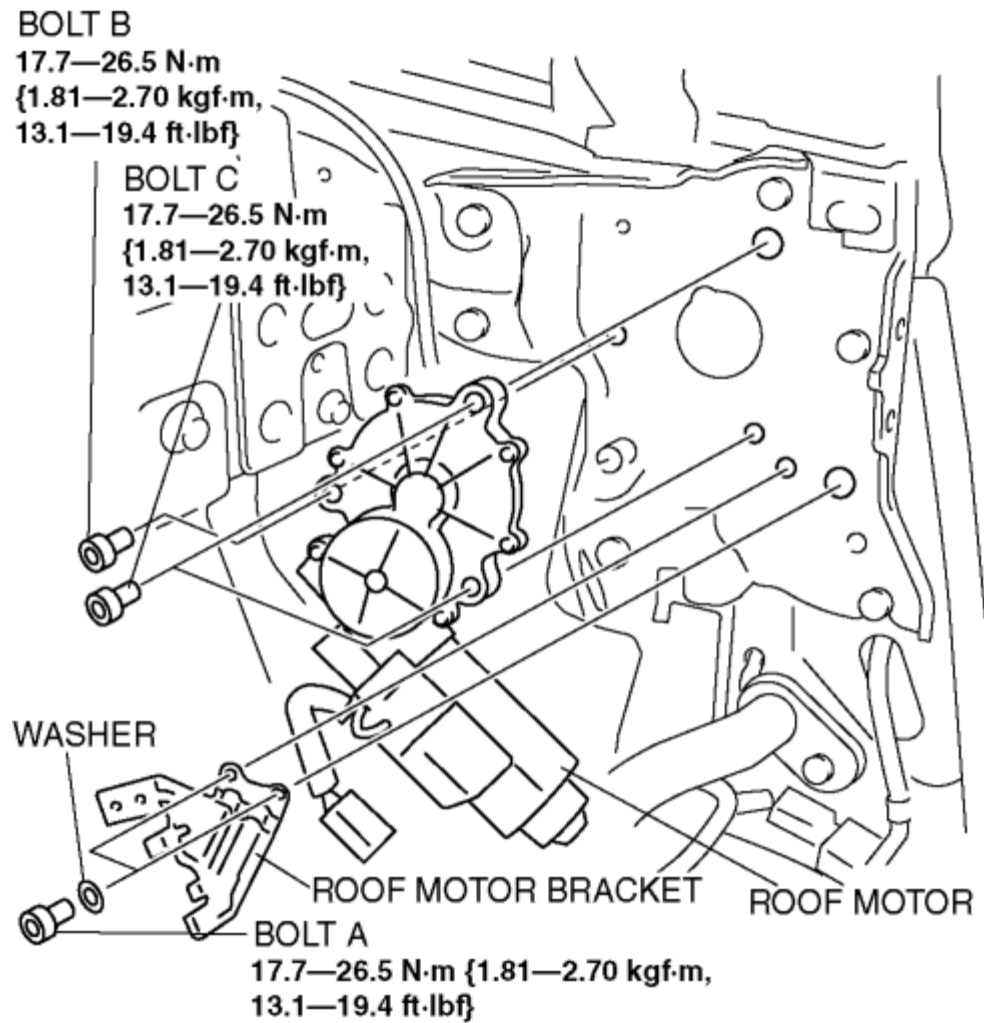
**NOTE:**

- Pulse interval varies with the deck panel operation speed.

## 2008 - MX-5 - Body and Accessories

### ROOF MOTOR REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the following parts:
  - a. Console (See [CONSOLE PANEL REMOVAL/INSTALLATION.](#))
  - b. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION.](#))
  - c. Scuff plate (See [SCUFF PLATE REMOVAL/INSTALLATION.](#))
  - d. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION.](#))
  - e. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION.](#))
  - f. Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION.](#))
  - g. Back trim (See [BACK TRIM REMOVAL/INSTALLATION.](#))
  - h. Seat belt upper anchor installation bolt (See [SEAT BELT REMOVAL/INSTALLATION.](#))
  - i. Power retractable hardtop link bracket (See [POWER RETRACTABLE HARDTOP LINK BRACKET REMOVAL/INSTALLATION.](#))
4. Disconnect the roof motor connector.
5. Remove the bolts A and washers.



6. Remove the roof motor bracket.
7. Remove the bolts B and C.
8. Remove the roof motor.
9. Install in the reverse order of removal.

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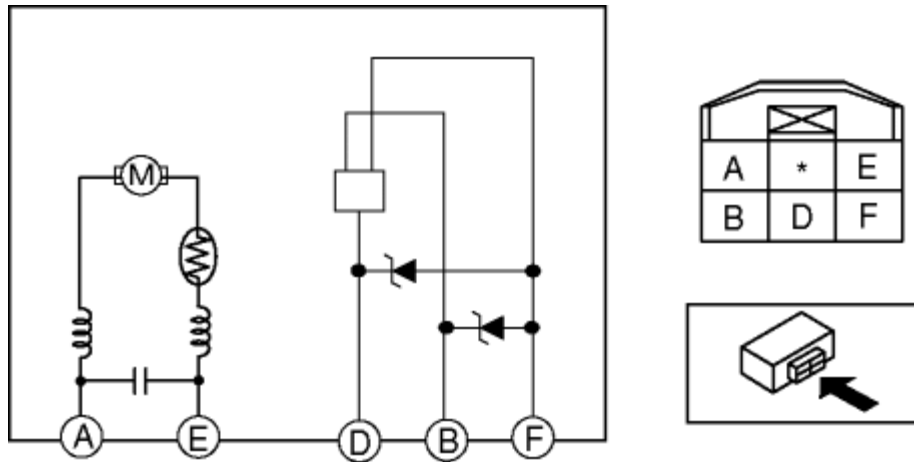
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## 2008 - MX-5 - Body and Accessories

### ROOF MOTOR INSPECTION

1. Apply battery positive voltage and connect the ground to roof motor terminals A and E, and then inspect the roof motor operation.



- If the roof motor does not operate as indicated in the table, replace it.

#### CAUTION:

- If the roof motor temperature is high, the motor may not rotate due to the motor internal PTC function. Leave it untouched for about 3 min to cool it down, then reinspect.

Operation	Terminal	
	E	A
Open	B+	Ground
Close	Ground	B+

2. Connect the battery positive voltage to roof motor terminal B and connect terminal F to ground.

3. Operate the roof motor and measure the voltage at terminal D.

- If there is any malfunction, replace the roof motor.

#### Voltage

Pulse: max. 13 V/min. 0 V

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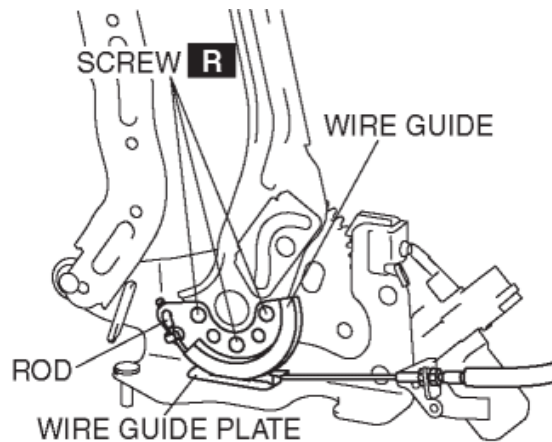
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## 2008 - MX-5 - Body and Accessories

### DECK PANEL REMOVAL/INSTALLATION

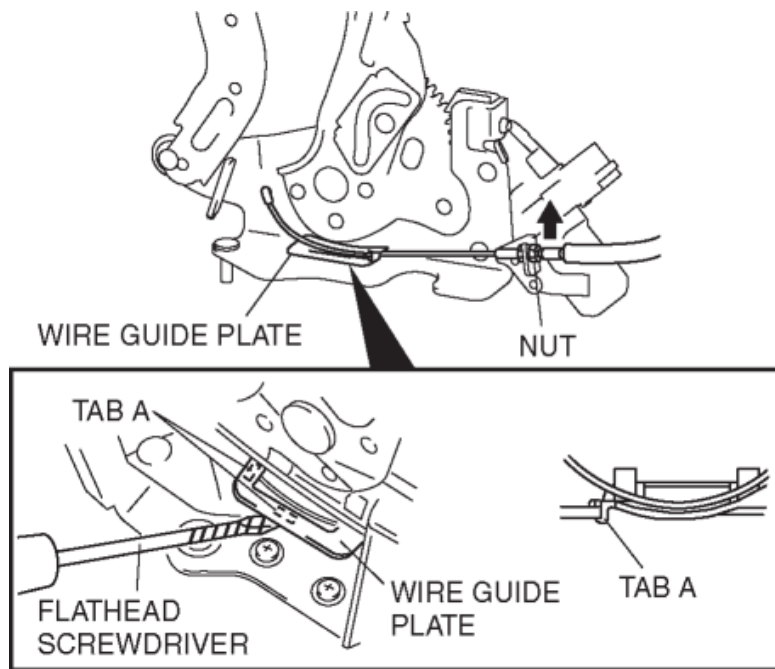
#### CAUTION:

- If the deck panel does not operate electrically, see "DECK PANEL MANUAL OPEN/CLOSE PROCEDURE" to open/close the deck panel. (See [DECK PANEL MANUAL OPEN/CLOSE PROCEDURE](#).)
1. Fully open the deck panel.
  2. Remove the battery cover.
  3. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION\[LF\]](#).)
  4. Set the side shelf out of the way. (See [SIDE SHELF REMOVAL/INSTALLATION](#).)
  5. Insert a Phillips screwdriver with no wear securely into each screw groove and remove the screws.



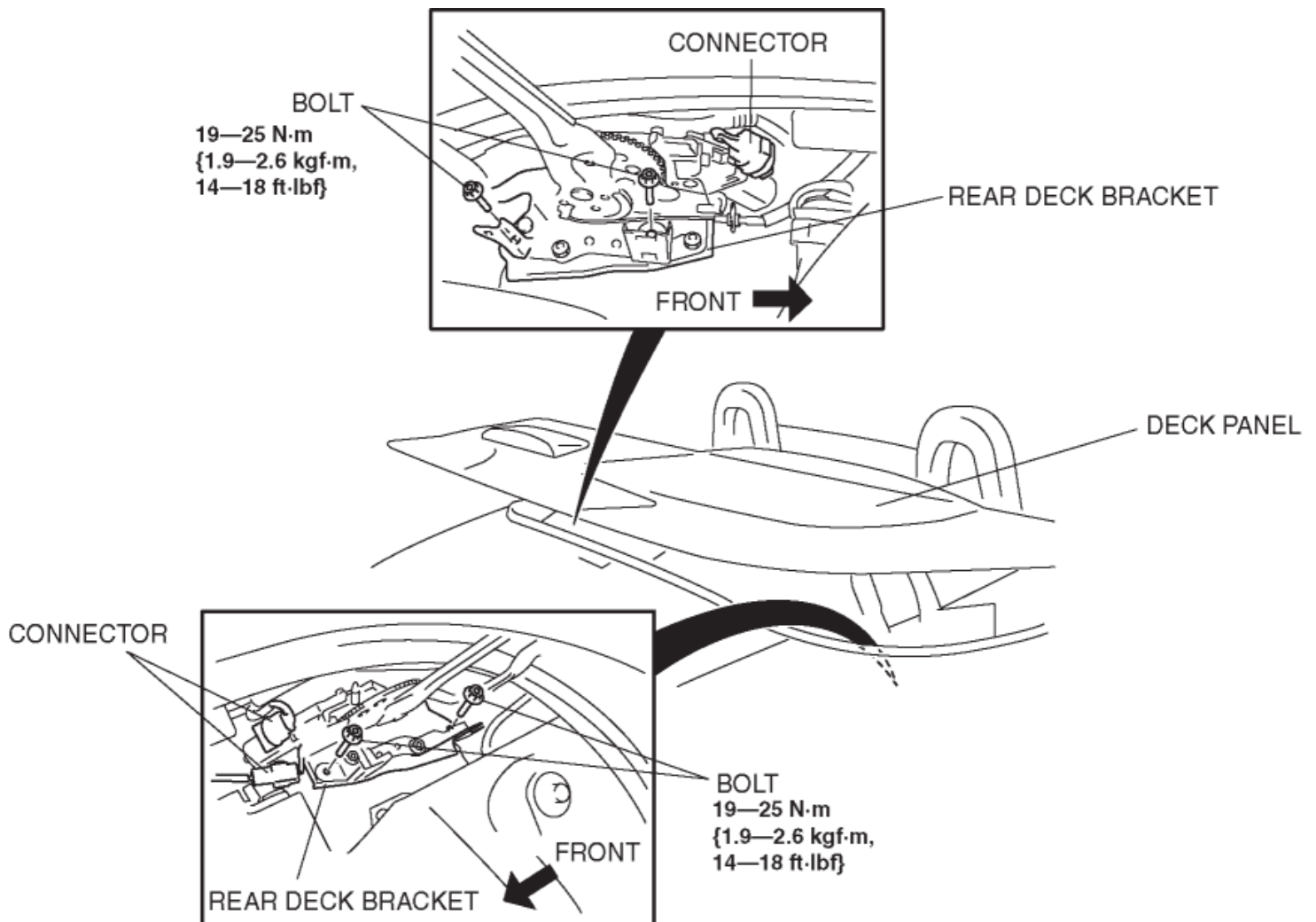
#### CAUTION:

- The screws are engaged firmly because thread-locking compound has been applied to them. When removing the screws, be careful not to deform the screw groove.
6. Remove the rod from the wire guide.
  7. Remove tabs A using a tape-wrapped flathead screwdriver, and then remove the wire guide plate.



8. Loosen the nut, then pull the roof hook cable in the direction shown by the arrow and remove it.

9. Remove the bolts.



10. Disconnect the deck panel motor connectors.

11. Disconnect the high-mount brake light connector.



12. Disconnect the deck panel limit switch connector.
13. Remove the deck panel.
14. Install in the reverse order of removal.

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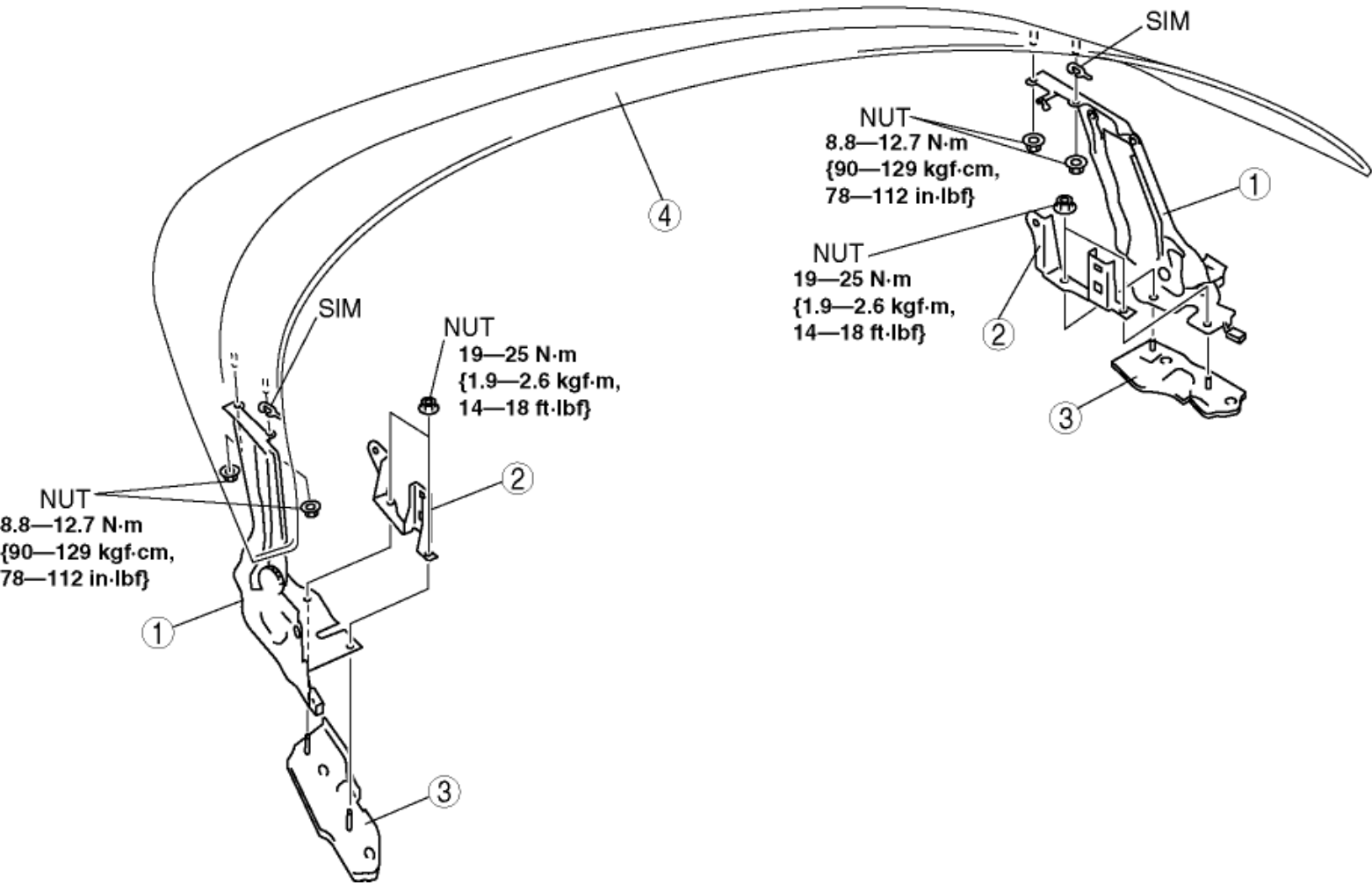
2008 - MX-5 - Body and Accessories

DECK PANEL DISASSEMBLY/ASSEMBLY

- 1. Remove the deck panel motors. (See [DECK PANEL MOTOR REMOVAL/INSTALLATION.](#))
- 2. Remove the high-mount brake light. (See [HIGH-MOUNT BRAKE LIGHT REMOVAL/INSTALLATION.](#))

NOTE:

- Verify the number of shims because it differs depending on the installation position.
- 3. Disassemble in the order indicated in the table.
  - 4. Assemble in the reverse order of disassembly.



1	Deck panel link
2	Deck panel link upper bracket
3	Deck panel link lower bracket

4 Deck panel

(See [Deck Panel Link Removal Note.](#))

(See [Deck Panel Link Installation Note.](#))

#### **Deck Panel Link Removal Note**

1. When removing the deck panel link, place the positioning mark by affixing masking tape on the deck panel link and deck panel.

#### **Deck Panel Link Installation Note**

1. Install the shim according to the number verified prior to removal.
2. Align the alignment marks placed before the deck panel link removal and install the deck panel link.
3. Refer to DECK PANEL ADJUSTMENT and verify that the gap and height difference between the deck panel, trunk lid, and back window glass are within the specifications. Adjust the power retractable hardtop if necessary. (See [DECK PANEL ADJUSTMENT.](#))

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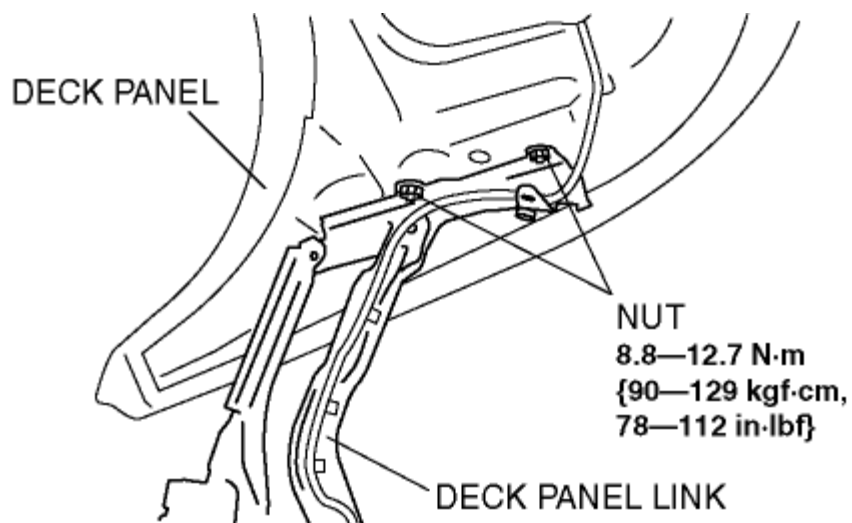
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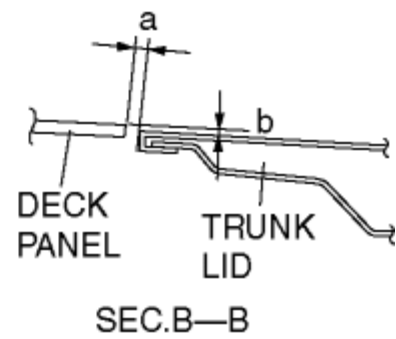
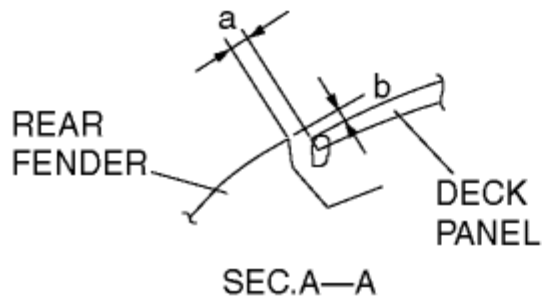
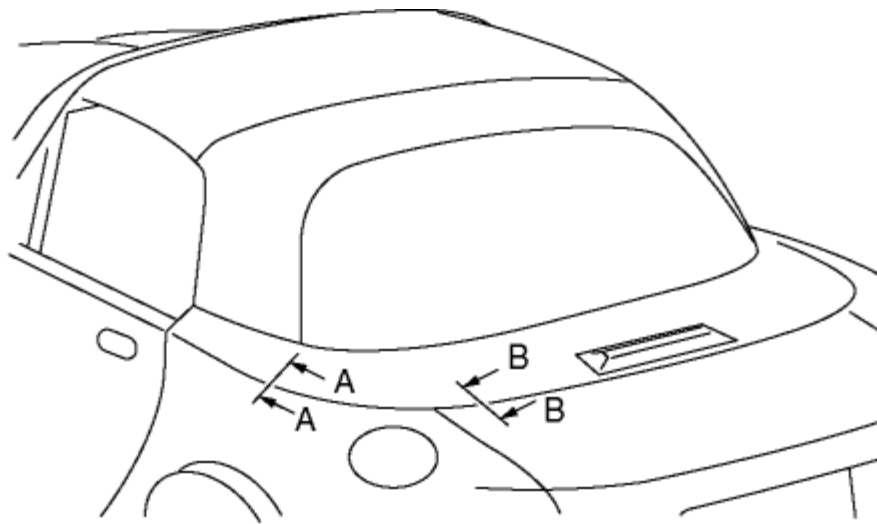
## 2008 - MX-5 - Body and Accessories

### DECK PANEL ADJUSTMENT

1. Loosen the installation nuts for deck panel.



2. Adjust the gap and height difference between the deck panel and trunk lid within the specification by moving the deck panel back and forth, left and right, and by adjusting the number of shims if necessary.



#### Clearance

- a: 4—6 mm {0.16—0.23 in}
- b: -2—2 mm {-0.07—0.07 in}

3. Tighten the nuts.

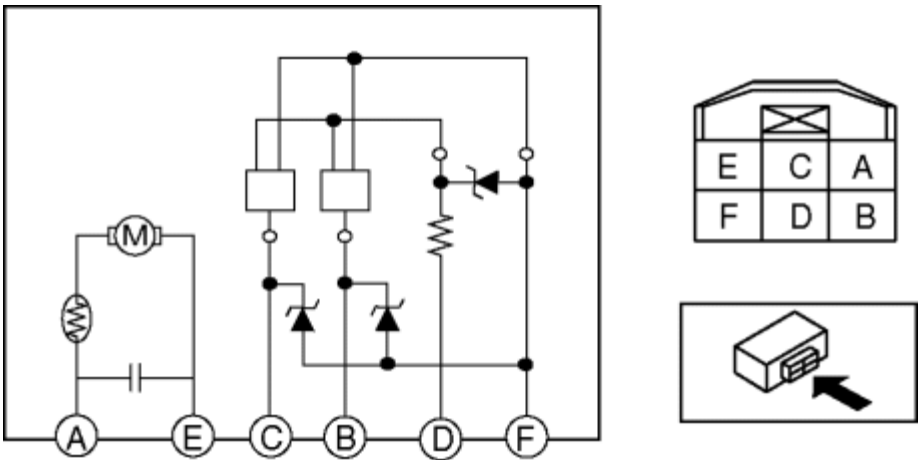
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2008 - MX-5 - Body and Accessories

DECK PANEL MOTOR INSPECTION

1. Apply battery positive voltage and connect the ground to deck panel motor terminals A and E, and then inspect the deck panel motor operation.



- If the deck panel motor does not operate as indicated in the table, replace it.

CAUTION:

- If the deck panel motor temperature is high, the motor may not rotate due to the motor internal PTC function. Leave it untouched for about 3 min to cool it down, then reinspect.

Operation	Terminal	
	E	A
Open	Ground	B+
Close	B+	Ground

2. Connect the battery positive voltage to deck panel motor terminal D and connect terminal F to ground.

3. Operate the deck panel motor and measure the voltage at terminal B.

- If there is any malfunction, replace the deck panel motor.

NOTE:

Terminal C is not used for the system control.

### **Voltage**

- Pulse: max. 13 V/min. 0 V

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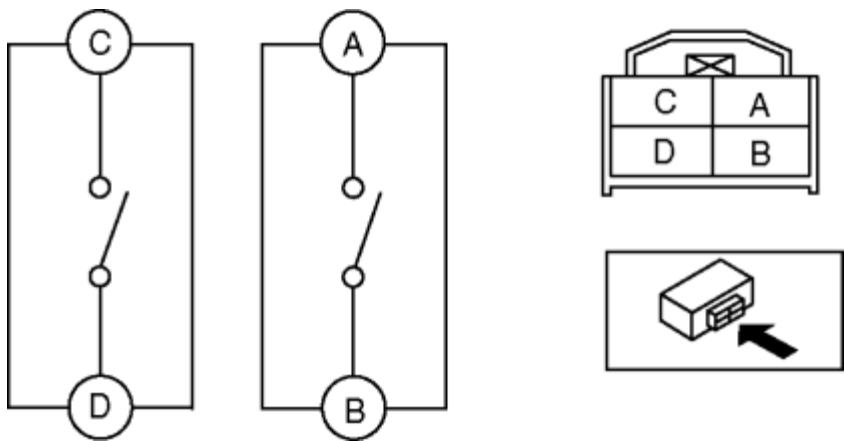
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2008 - MX-5 - Body and Accessories

POWER RETRACTABLE HARDTOP LIMIT SWITCH INSPECTION

1. Verify that the continuity between the power retractable hardtop limit switch terminals is as indicated in the table.



- If not as indicated in the table, replace the roof motor link (RH). (The power retractable hardtop limit switch is integrated with the roof motor link (RH).)

○—○ : Continuity

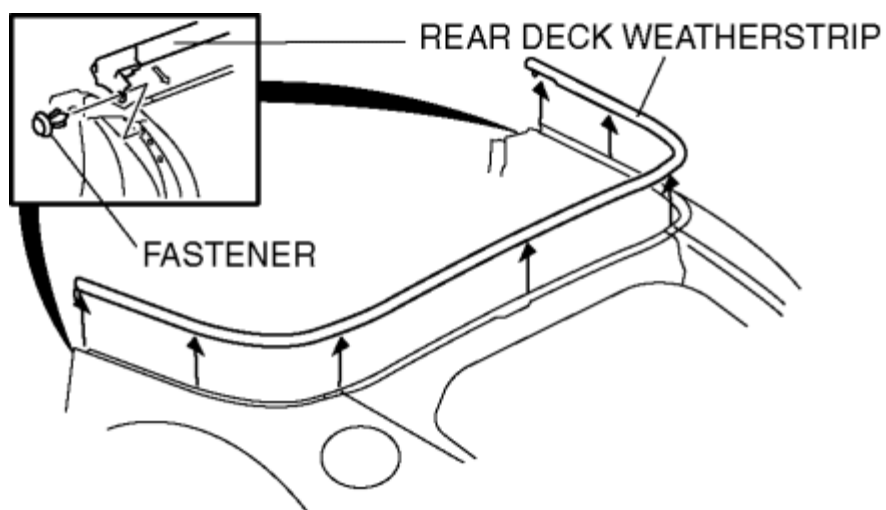
Switch position		Terminal			
		A	B	C	D
POWER RETRACTABLE HARDTOP CLOSE POSITION SWITCH	ROD PUSHED	○—○			
	NORMAL CONDITUION				
POWER RETRACTABLE HARDTOP OPEN POSITION SWITCH	ROD PUSHED			○—○	
	NORMAL CONDITUION				



## 2008 - MX-5 - Body and Accessories

### REAR DECK WEATHERSTRIP REMOVAL

1. Fully open the deck panel.
2. Remove the quarter trim. (See [QUARTER TRIM REMOVAL/INSTALLATION](#).)
3. Remove the cab-side weatherstrip. (See [CONVERTIBLE TOP DISASSEMBLY/ASSEMBLY](#).)
4. Remove the fasteners.

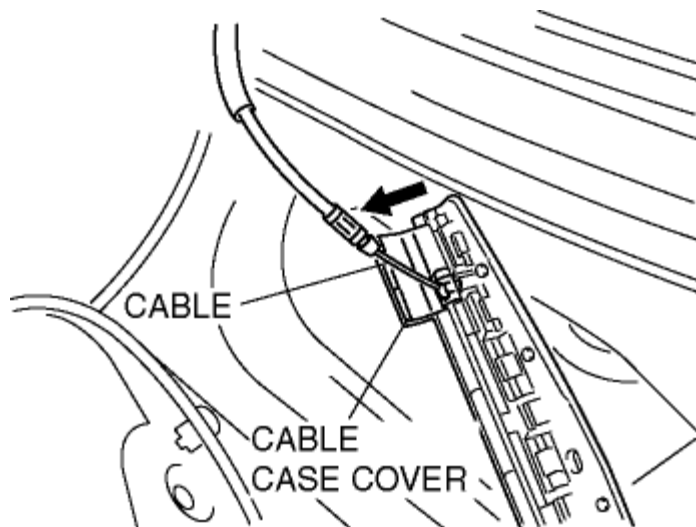


5. Remove the rear deck weatherstrip.

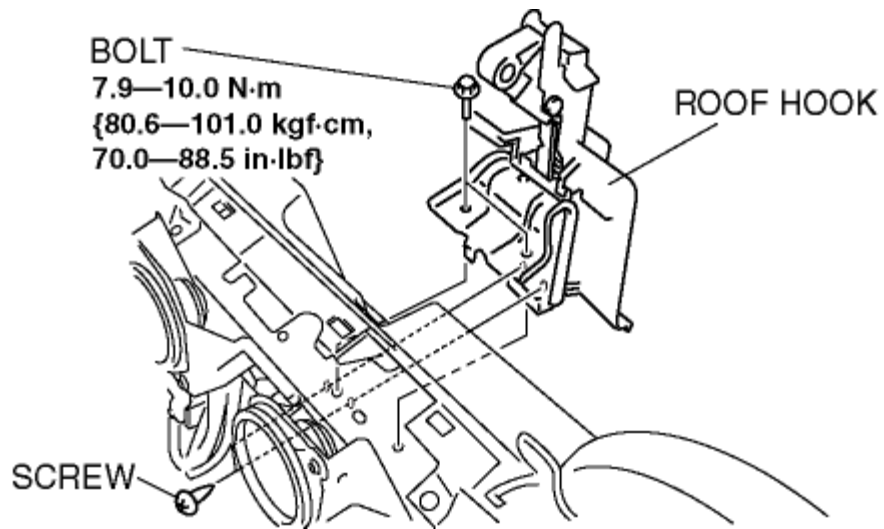
## 2008 - MX-5 - Body and Accessories

### ROOF HOOK REMOVAL/INSTALLATION

1. Fully close the power retractable hardtop.
2. Remove the following parts:
  - a. Console (See [CONSOLE PANEL REMOVAL/INSTALLATION.](#))
  - b. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION.](#))
  - c. Scuff plate (See [SCUFF PLATE REMOVAL/INSTALLATION.](#))
  - d. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION.](#))
  - e. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION.](#))
  - f. Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION.](#))
  - g. Back trim (See [BACK TRIM REMOVAL/INSTALLATION.](#))
3. Open the cable case cover and disconnect the cable while pressing the cable in the direction of the arrow. (See [Roof Hook Install Note.](#))

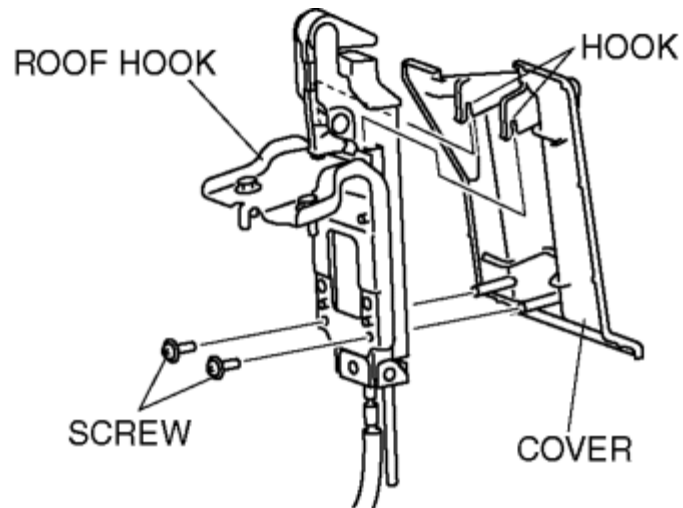


4. Remove the bolts.



5. Remove the roof hook.

6. Remove the screws.



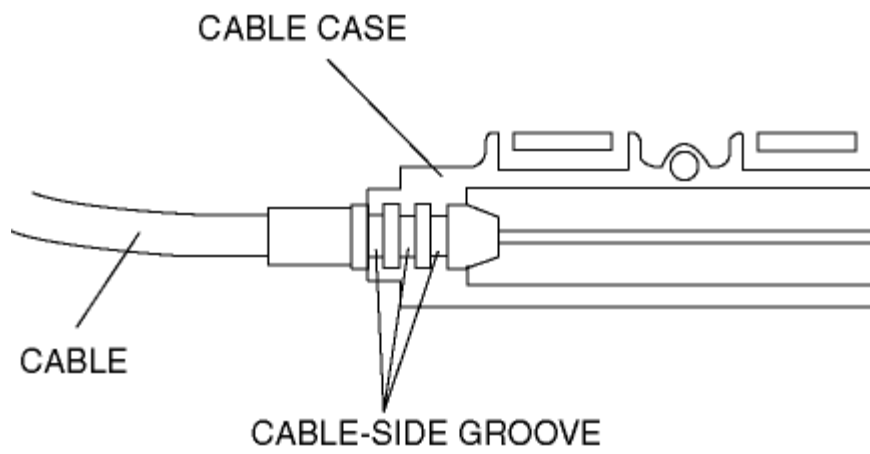
7. Pull up the cover and remove the hook.

8. Remove the cover.

9. Install in the reverse order of removal.

### Roof Hook Install Note

1. Securely fix the 3 grooves to the cable case.



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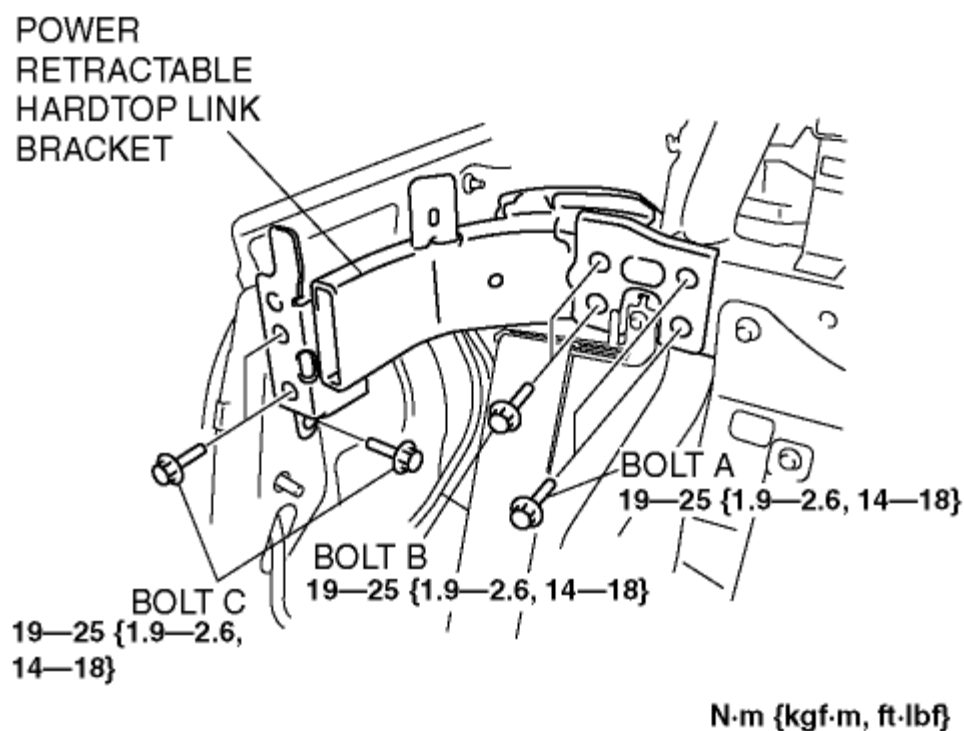
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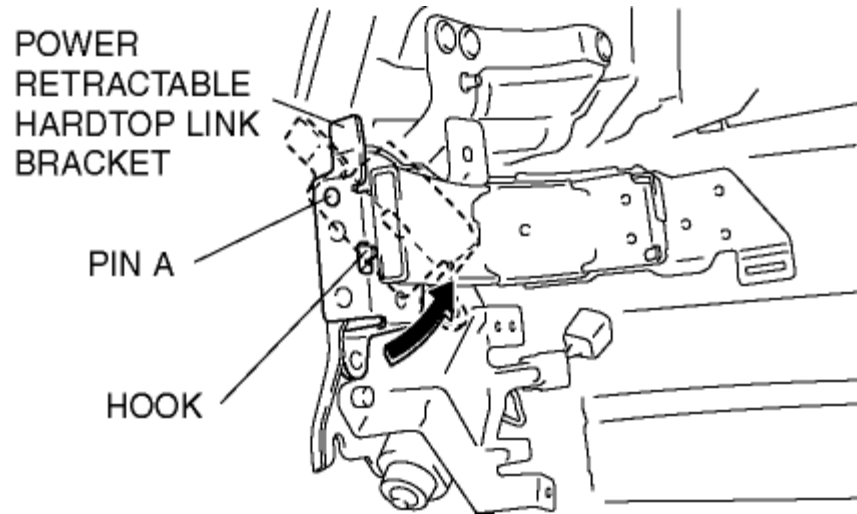
### POWER RETRACTABLE HARDTOP LINK BRACKET REMOVAL/INSTALLATION

1. Remove the following parts:
  - a. Console (See [CONSOLE PANEL REMOVAL/INSTALLATION.](#))
  - b. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION.](#))
  - c. Scuff plate (See [SCUFF PLATE REMOVAL/INSTALLATION.](#))
  - d. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION.](#))
  - e. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION.](#))
  - f. Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION.](#))
  - g. Back trim (See [BACK TRIM REMOVAL/INSTALLATION.](#))
  - h. Seat belt upper anchor installation bolt (See [SEAT BELT REMOVAL/INSTALLATION.](#))
2. Remove the bolts A, B and C. (See [Bolt B, C Install Note.](#))



3. Remove the junction. (See [SEAT BACK CROSSMEMBER ASSEMBLY REMOVAL/INSTALLATION.](#))
4. Loosen the installation bolts and nuts of the seat back crossmember component, and tilt the seat back crossmember component towards the vehicle front. (See [SEAT BACK CROSSMEMBER ASSEMBLY REMOVAL/INSTALLATION.](#))
5. Rotate the power retractable hardtop link bracket in the direction shown by the arrow at the

pivot fulcrum of pin A and set the hook out of the way.

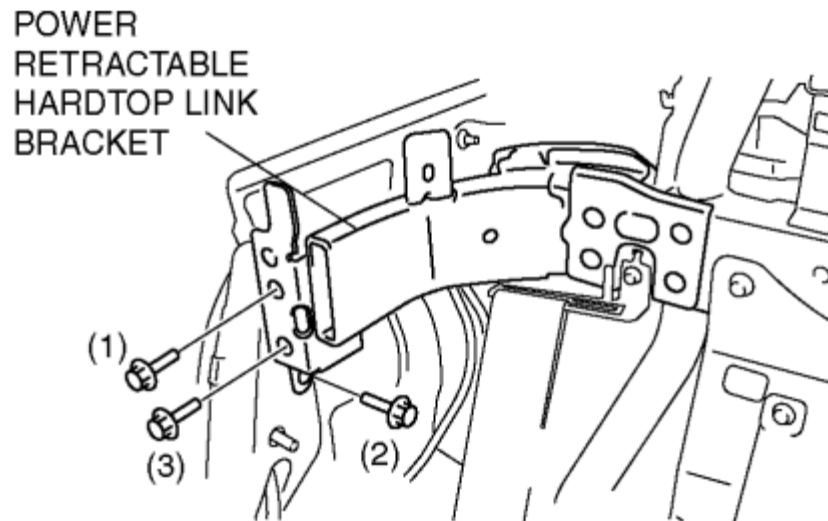


6. Remove the power retractable hardtop link bracket.

7. Install in the reverse order of removal.

### Bolt B, C Install Note

1. Temporarily tighten all the bolts, then tighten the bolts in the order indicated in the figure.



### Tightening torque

- 19—25 N·m {1.9—2.6 kgf·m, 14—18 ft·lbf}

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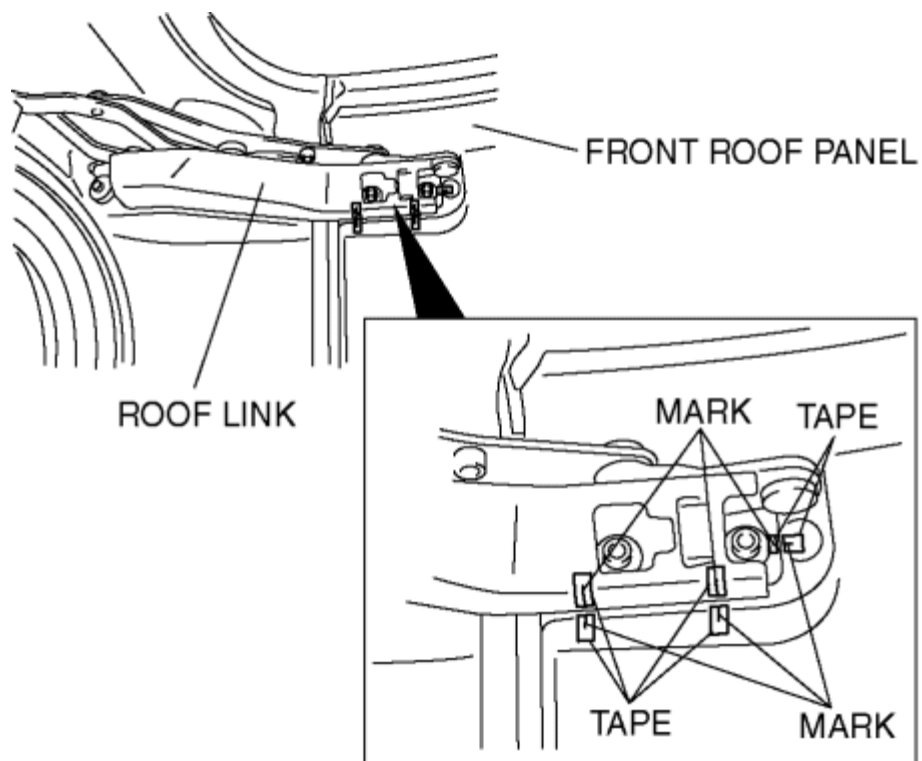
## 2008 - MX-5 - Body and Accessories

### FRONT ROOF PANEL REMOVAL/INSTALLATION

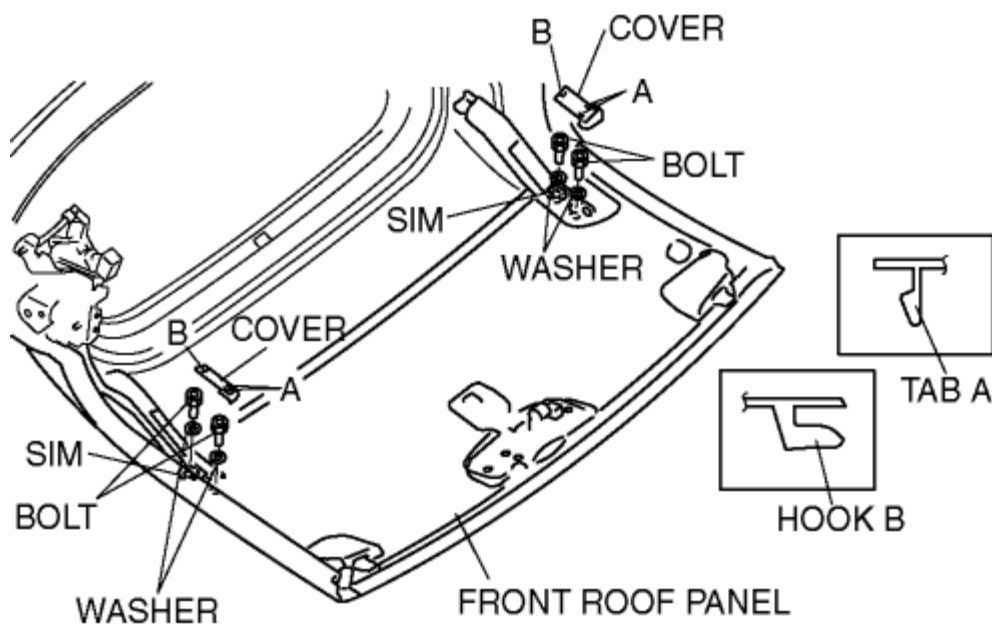
1. Fully open the deck panel.
2. Cover both sides of the rear window glass with thick cloth to protect the window.
3. Remove the battery cover.
4. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION\[LF\]](#).)
5. Remove the following parts:
  - a. Console (See [CONSOLE REMOVAL/INSTALLATION](#).)
  - b. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION](#).)
  - c. Scuff plate (See [SCUFF PLATE REMOVAL/INSTALLATION](#).)
  - d. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION](#).)
  - e. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION](#).)
  - f. Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION](#).)
  - g. Back trim (See [BACK TRIM REMOVAL/INSTALLATION](#).)
  - h. Seat belt upper anchor installation bolt (See [SEAT BELT REMOVAL/INSTALLATION](#).)
  - i. Power retractable hardtop link bracket (See [POWER RETRACTABLE HARDTOP LINK BRACKET REMOVAL/INSTALLATION](#).)
  - j. Cab-side weatherstrip (See [CONVERTIBLE TOP DISASSEMBLY/ASSEMBLY](#).)
  - k. Power retractable hardtop (See [POWER RETRACTABLE HARDTOP REMOVAL/INSTALLATION](#).)

#### NOTE:

- Verify the number of shims because it differs depending on the installation position.
6. When removing the front roof panel, place the positioning mark by affixing masking tape on the roof link and front roof panel.



7. Remove the tabs A and hook B.



8. Remove the cover.

9. Remove the bolts and washers.

10. Remove the sims.

11. Remove the front roof panel.

12. Install in the reverse order of removal.

### Front roof Panel Installation Note



1. Install the shim according to the number verified prior to removal.
2. Align the alignment marks placed before the front roof panel removal and install the front roof panel.
3. Refer to POWER RETRACTABLE HARDTOP ADJUSTMENT and verify that the gap and height difference between the front roof panel and middle roof panel are within the specifications. Adjust the power retractable hardtop if necessary. (See **POWER RETRACTABLE HARDTOP ADJUSTMENT**.)

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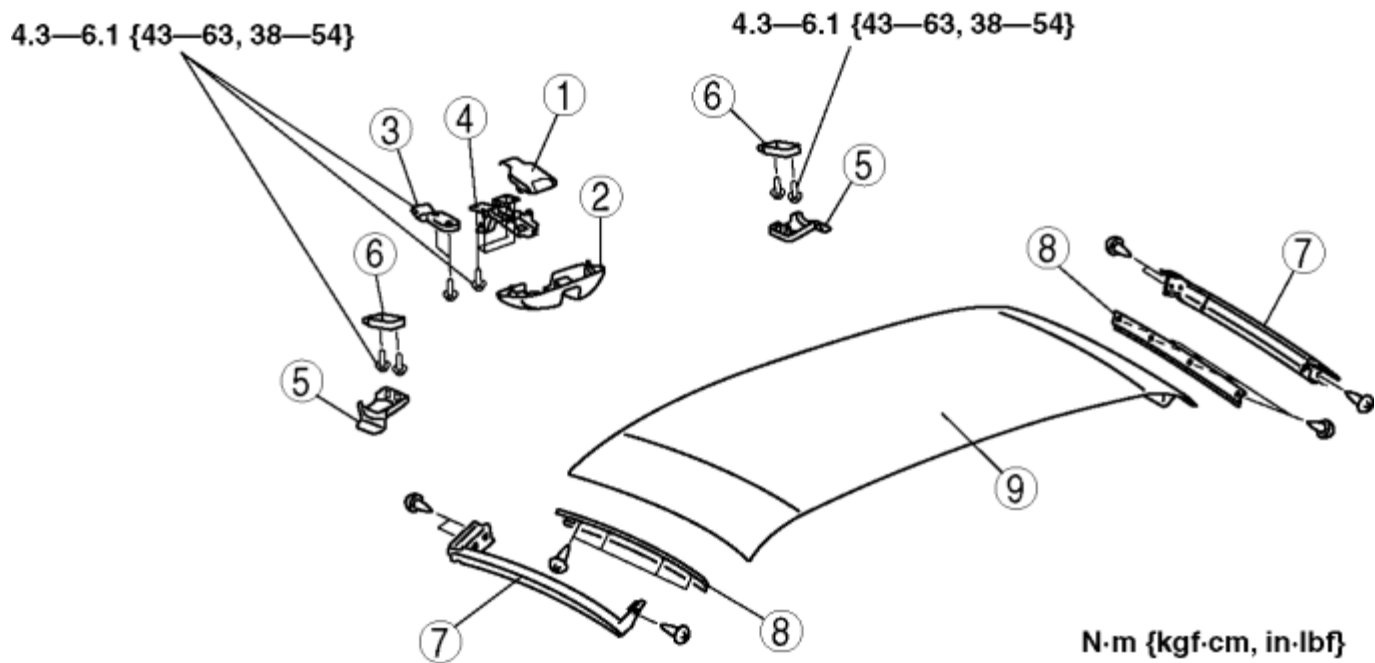
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FRONT ROOF PANEL DISASSEMBLY/ASSEMBLY

- 1. Disassemble in the order indicated in the table.
- 2. Assemble in the reverse order of disassembly.



1	Top lock lever cover
2	Top lock cover
3	Roof hook wedge
4	Top lock
5	Male wedge cover
6	Male wedge
7	Weatherstrip
8	Retainer

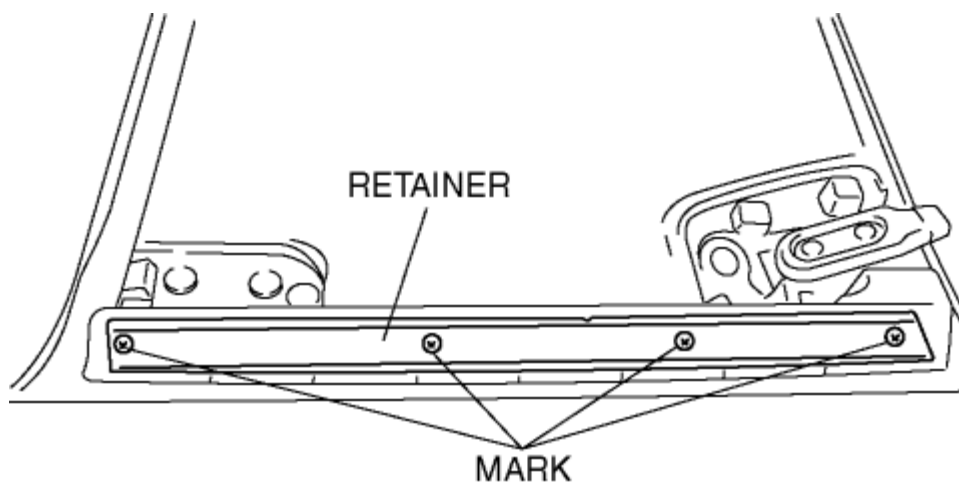
(See [Retainer Disassembly Note.](#))

(See [Retainer Assembly Note.](#))

9Front roof panel

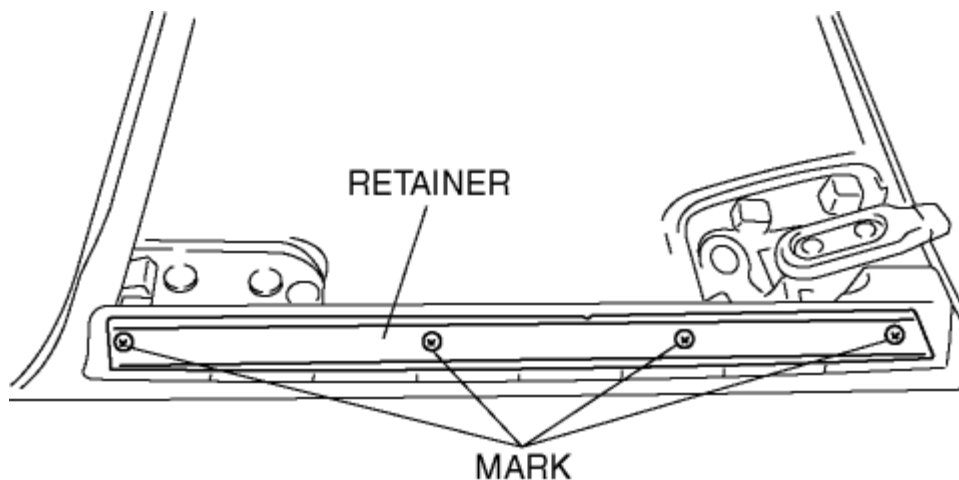
### Retainer Disassembly Note

1. Mark around the retainer installation screws with paint before removing them.



### Retainer Assembly Note

1. Install the retainers to the link, aligning the retainer marks with the retainer installation screws.



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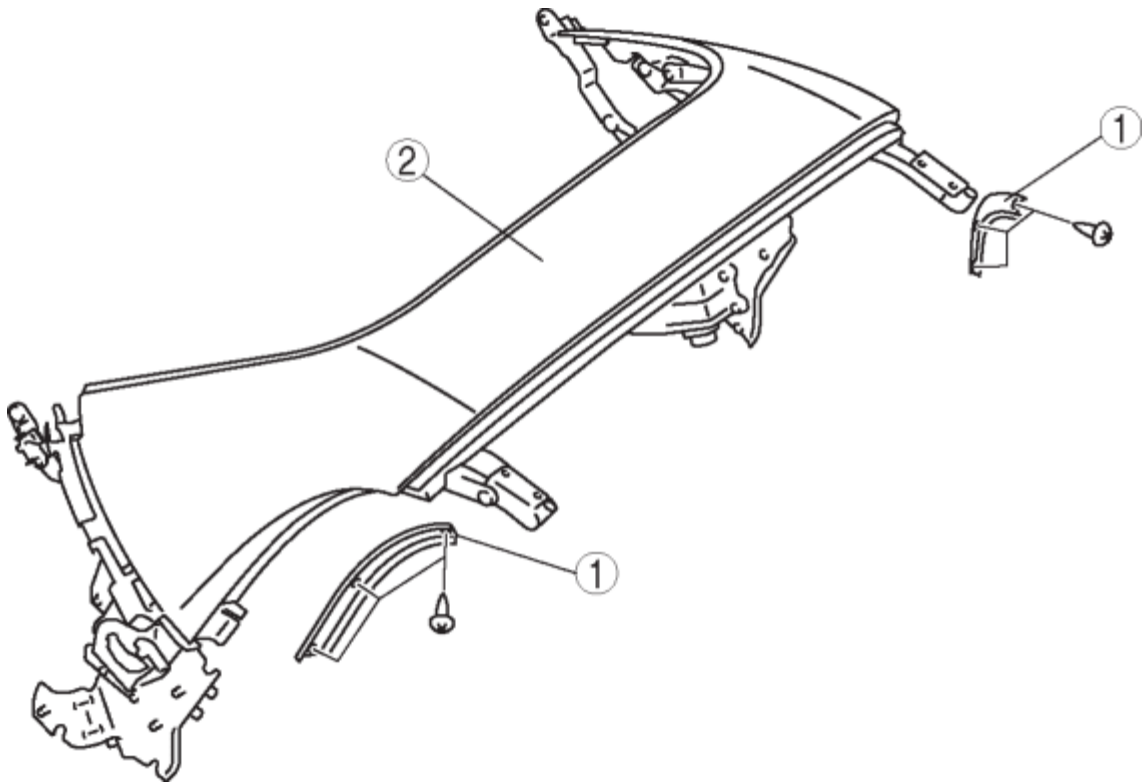
### MIDDLE ROOF PANEL REMOVAL/INSTALLATION

1. Fully open the deck panel.
2. Cover both sides of the rear window glass with thick cloth to protect the window.
3. Remove the battery cover.
4. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION\[LF\]](#).)
5. Remove the following parts:
  - a. Console (See [CONSOLE REMOVAL/INSTALLATION](#).)
  - b. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION](#).)
  - c. Scuff plate (See [SCUFF PLATE REMOVAL/INSTALLATION](#).)
  - d. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION](#).)
  - e. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION](#).)
  - f. Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION](#).)
  - g. Back trim (See [BACK TRIM REMOVAL/INSTALLATION](#).)
  - h. Seat belt upper anchor installation bolt (See [SEAT BELT REMOVAL/INSTALLATION](#).)
  - i. Power retractable hardtop link bracket (See [POWER RETRACTABLE HARDTOP LINK BRACKET REMOVAL/INSTALLATION](#).)
  - j. Cab-side weatherstrip (See [CONVERTIBLE TOP DISASSEMBLY/ASSEMBLY](#).)
  - k. Power retractable hardtop (See [POWER RETRACTABLE HARDTOP REMOVAL/INSTALLATION](#).)
6. Remove the front roof panel from the middle roof panel. (See [FRONT ROOF PANEL REMOVAL/INSTALLATION](#).)
7. Remove the rear window glass from the middle roof panel. (See [REAR WINDOW GLASS REMOVAL/INSTALLATION\[POWER RETRACTABLE HARDTOP\]](#).)
8. Remove the roof motor from the middle roof panel. (See [ROOF MOTOR REMOVAL/INSTALLATION](#).)
9. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### MIDDLE ROOF PANEL DISASSEMBLY/ASSEMBLY

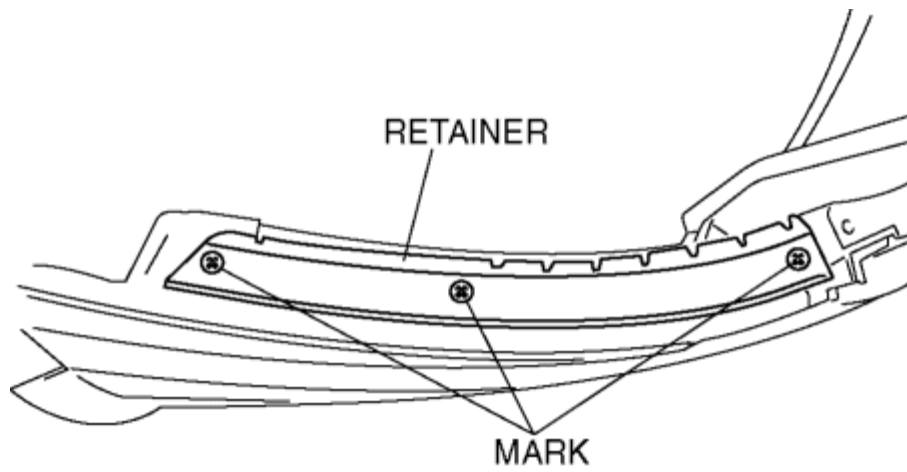
- 1. Remove the middle roof panel weatherstrip. (See [MIDDLE ROOF PANEL WEATHERSTRIP REMOVAL/INSTALLATION.](#))
- 2. Disassemble in the order indicated in the table.
- 3. Assemble in the reverse order of disassembly.



1	Retainer  (See <a href="#">Retainer Disassembly Note.</a> )  (See <a href="#">Retainer Assembly Note.</a> )
2	Middle roof panel

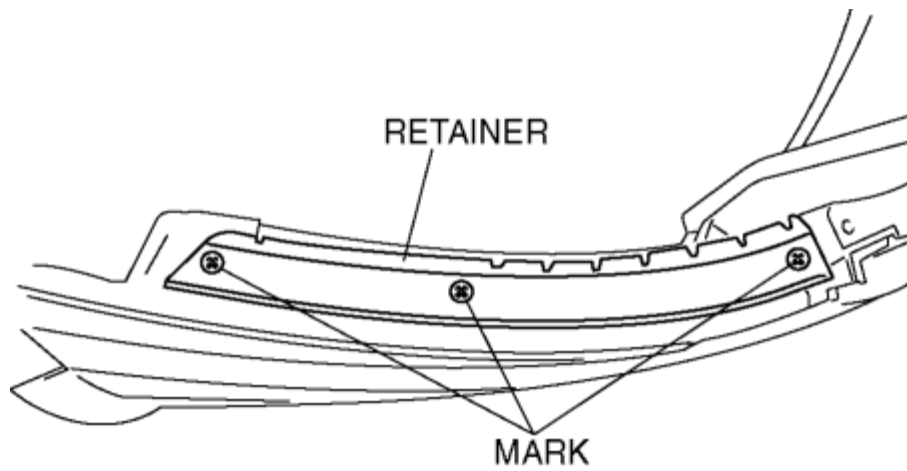
#### Retainer Disassembly Note

- 1. Mark around the retainer installation screws with paint before removing them.



### Retainer Assembly Note

1. Install the retainers to the link, aligning the retainer marks with the retainer installation screws.



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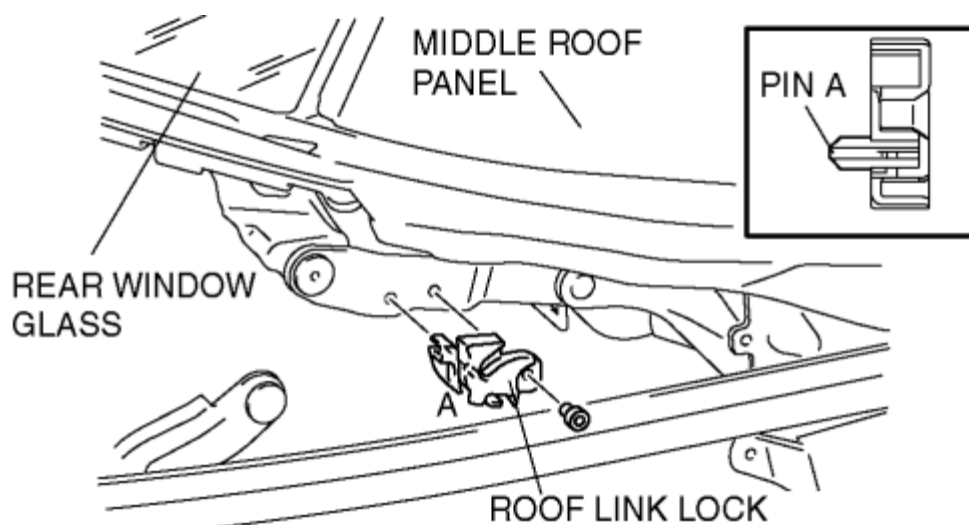
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## 2008 - MX-5 - Body and Accessories

### ROOF LINK REMOVAL/INSTALLATION

1. Fully open the deck panel.
2. Remove the rear defroster harness from the roof link lock (LH). (See [REAR WINDOW GLASS REMOVAL/INSTALLATION \[POWER RETRACTABLE HARDTOP\]](#).)
3. Remove the bolt.

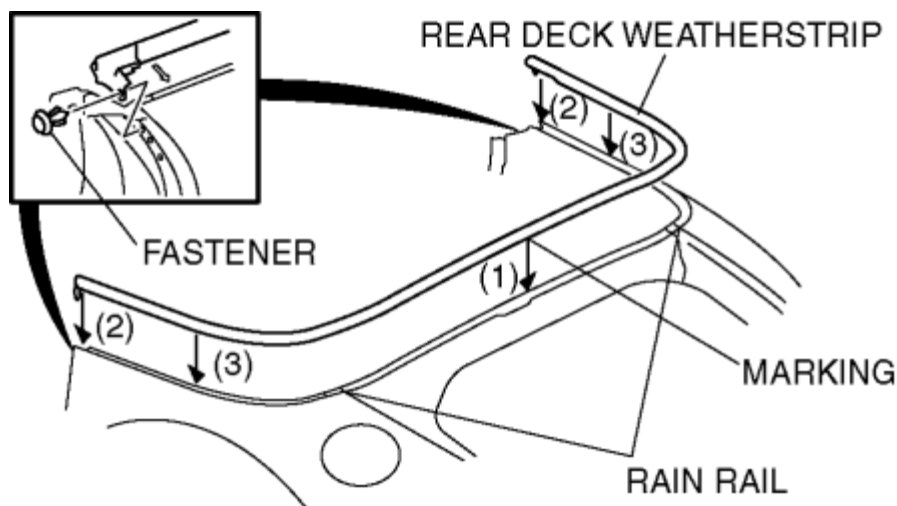


4. Remove the pin A.
5. Remove the roof link lock.
6. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### REAR DECK WEATHERSTRIP INSTALLATION

1. Align the deck flange with the weatherstrip marking, and insert. (1)



2. Peel off the tape backing of the butylene tape, align it to the molded part at the tip of the rear deck weatherstrip and press, then attach the fasteners. (2)
3. Install the rear deck weatherstrip. (3)
4. Install the cab-side weatherstrip. (See [CONVERTIBLE TOP DISASSEMBLY/ASSEMBLY.](#))
5. Install the quarter trim. (See [QUARTER TRIM REMOVAL/INSTALLATION.](#))



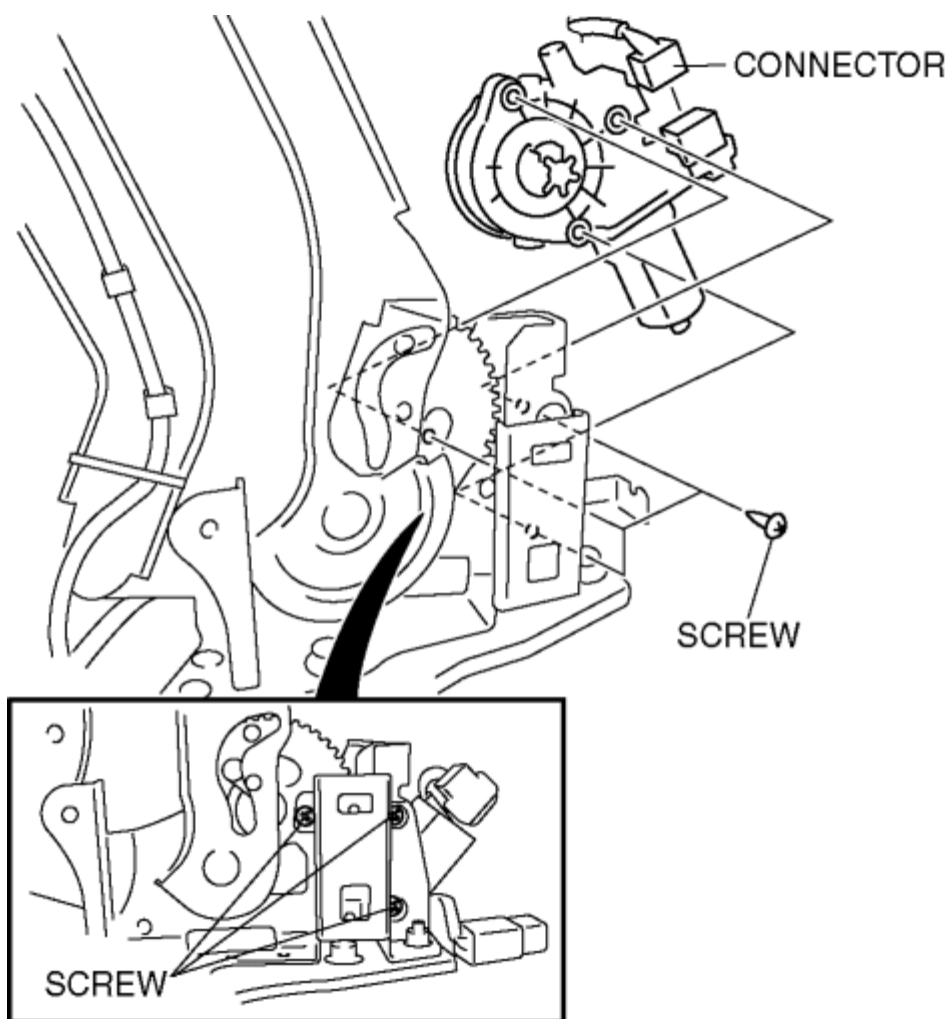
## 2008 - MX-5 - Body and Accessories

### DECK PANEL MOTOR REMOVAL/INSTALLATION

#### CAUTION:

- If the deck panel does not operate electrically, see "DECK PANEL MANUAL OPEN/CLOSE PROCEDURE" to open/close the deck panel. (See [DECK PANEL MANUAL OPEN/CLOSE PROCEDURE](#).)

1. Fully open the deck panel.
2. Remove the battery cover.
3. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
4. Set the side shelf out of the way. (See [SIDE SHELF REMOVAL/INSTALLATION](#).)
5. Remove the deck panel. (See [DECK PANEL REMOVAL/INSTALLATION](#).)
6. Remove the screws indicated in the figure.



7. Remove the deck panel motor.
8. Install in the reverse order of removal.

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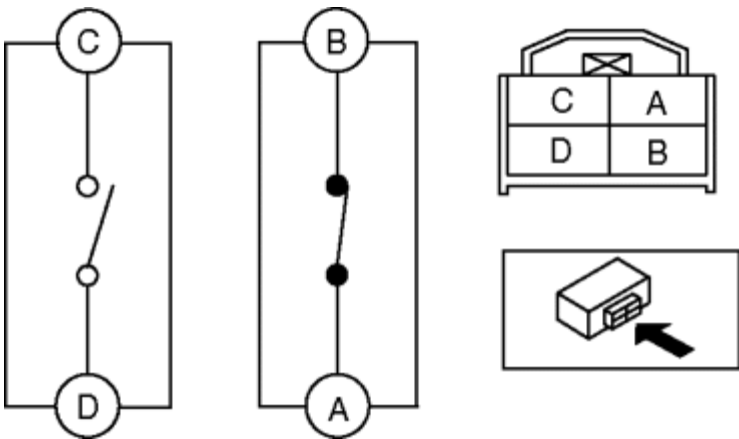
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2008 - MX-5 - Body and Accessories

DECK PANEL LIMIT SWITCH INSPECTION

1. Verify that the continuity between the deck panel limit switch terminals is as indicated in the table.



- If not as indicated in the table, replace the deck panel link (RH).

○—○ : Continuity

Switch position		Terminal			
		A	B	C	D
DECK PANEL CLOSE POSITION SWITCH	ROD PUSHED				
	NORMAL CONDITUION	○—○			
DECK PANEL OPEN POSITION SWITCH	ROD PUSHED			○—○	
	NORMAL CONDITUION				

2008 - MX-5 - Body and Accessories

POWER RETRACTABLE HARDTOP SWITCH INSPECTION

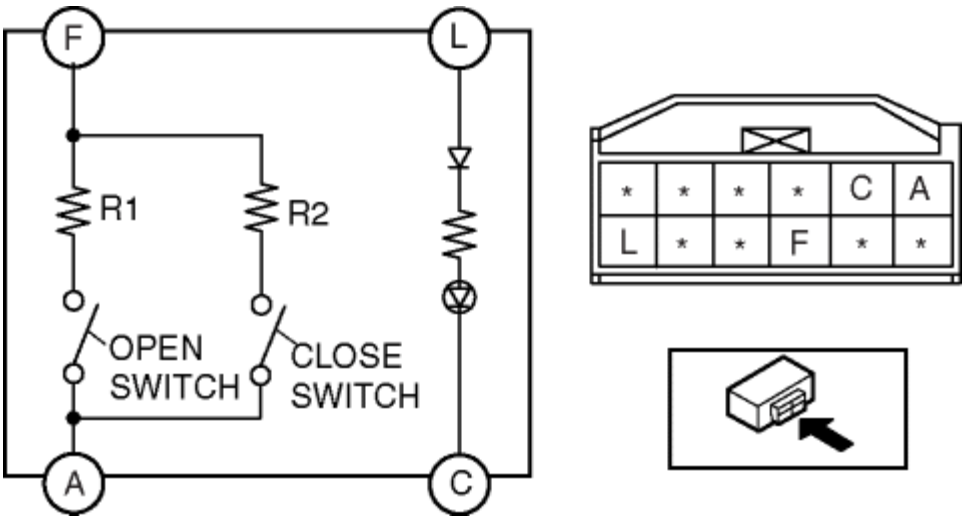
1. Verify that the continuity between the power retractable hardtop switch terminals is as indicated in the table.

○⏏○ : Resistance

Test condition		Terminal	
		F	A
OPEN SWITCH	ON	○—R1—○	
	OFF		
CLOSE SWITCH	ON	○—R2—○	
	OFF		

R1 : 990—1010 ohms  
R2 : 2178—2222 ohms

- If not as indicated in the table, replace the hazard warning switch.
2. Apply battery voltage to power retractable hardtop switch terminal L, and connect terminal C to ground.



3. Verify that the LED illuminates.
- If there is any malfunction, replace the hazard warning switch.



## 2008 - MX-5 - Body and Accessories

### DECK PANEL MANUAL OPEN/CLOSE PROCEDURE

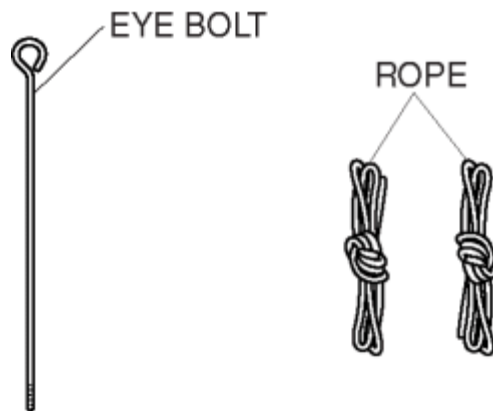
#### CAUTION:

- Because the pinion gear (deck panel motor) and sector gear are disengaged when the manual open/close procedure is performed, the deck panel does not operate electrically after a repair. It is necessary to perform the recovery procedure to engage the pinion gear (deck panel motor) and sector gear. (See [Recovery Procedure](#).)

### Deck Panel Manual Open/Close Procedure And Temporary Measure Procedure

#### NOTE:

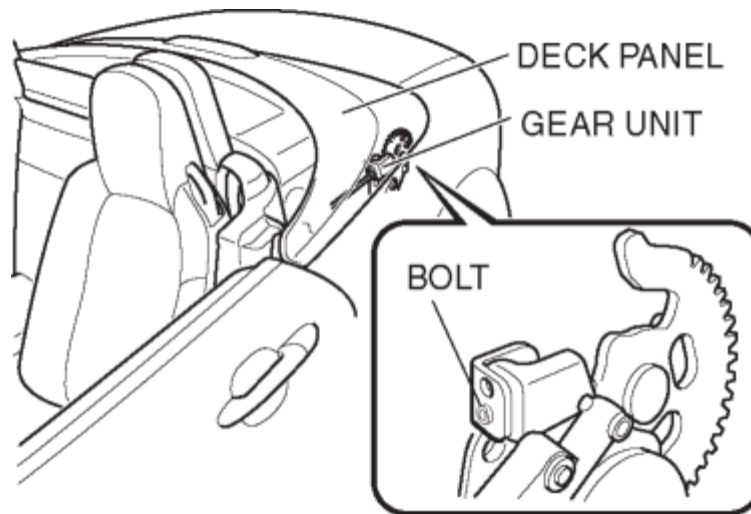
- The temporary measure is for releasing the lock using a rope if the deck panel needs to be opened/closed again or to drive the vehicle after the deck panel manual open/close procedure has been performed. To open/close the deck panel manually on the vehicle where the temporary measure has already been performed, open/close the deck panel manually referring to "Deck panel manual open/close procedure after temporary measure". (See [Close the deck panel \(Temporary measure\)](#).)
- To perform the following procedure, use the tools that comes with the vehicle.



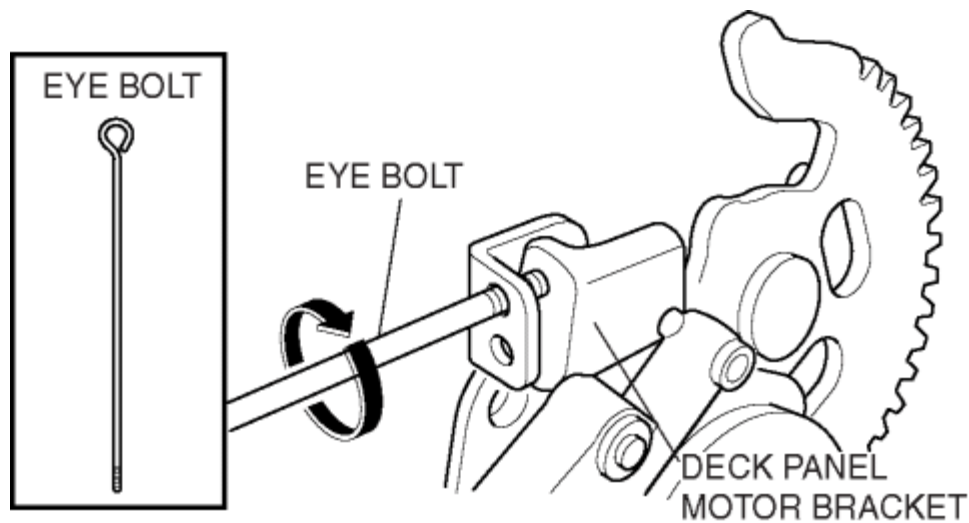
- To free the deck panel, both the motors need to be unlocked.
- The following procedure is only for the left side. Perform the same procedure on the right side to free the deck panel.

#### Open the deck panel

1. Remove the bolts.



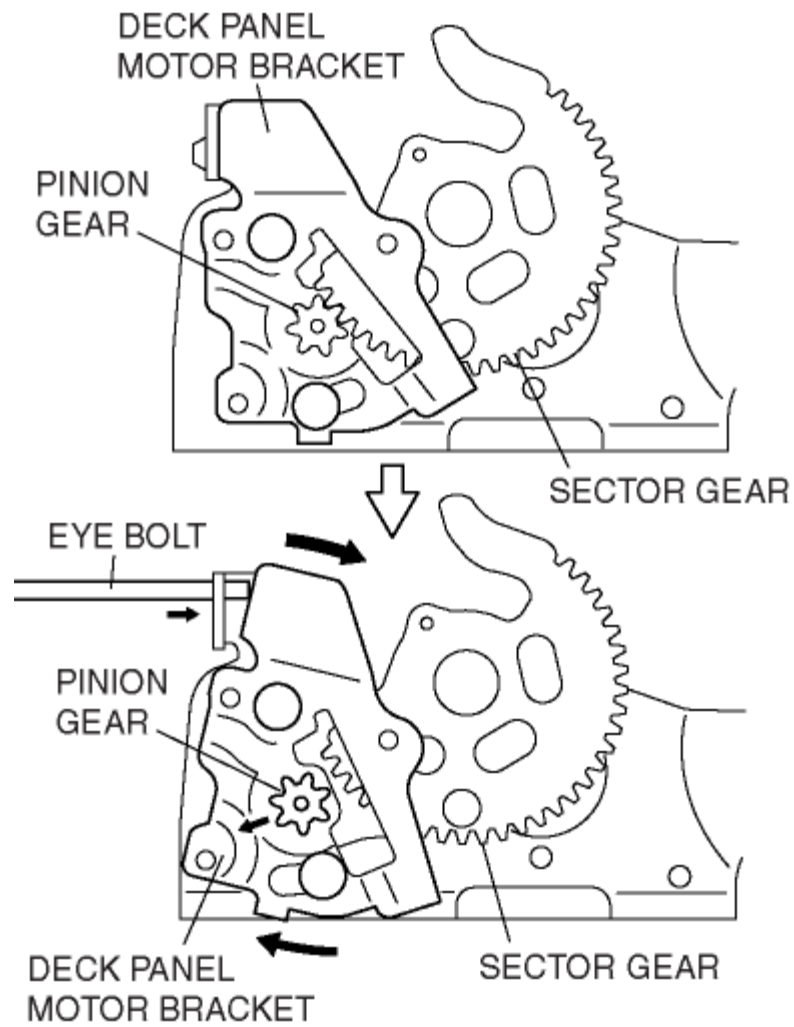
2. Insert the eye bolt into the thread hole above the removed bolt.



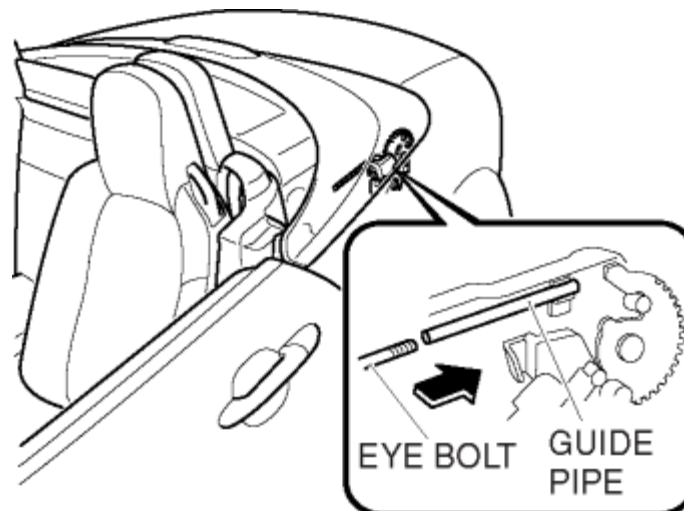
3. Rotate the eye bolt in the tightening direction seven times to press the deck panel motor bracket.

**NOTE:**

- When the deck panel motor bracket is pressed, the deck panel motor bracket rotates, and the pinion gear (deck panel motor) and sector gear are disengaged.

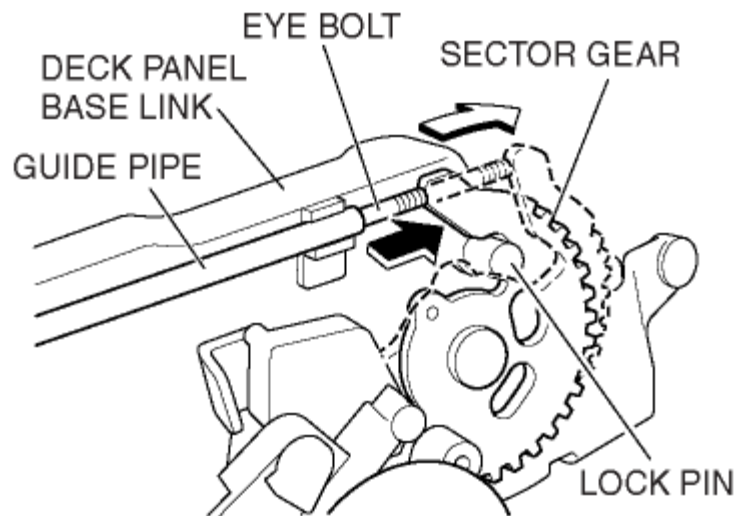


4. Remove the eye bolt.
5. Insert the eye bolt into the guide pipe shown in the figure.



6. Press the eye bolt towards the vehicle rear and disengage the sector gear and the lock pin of the deck panel base link.





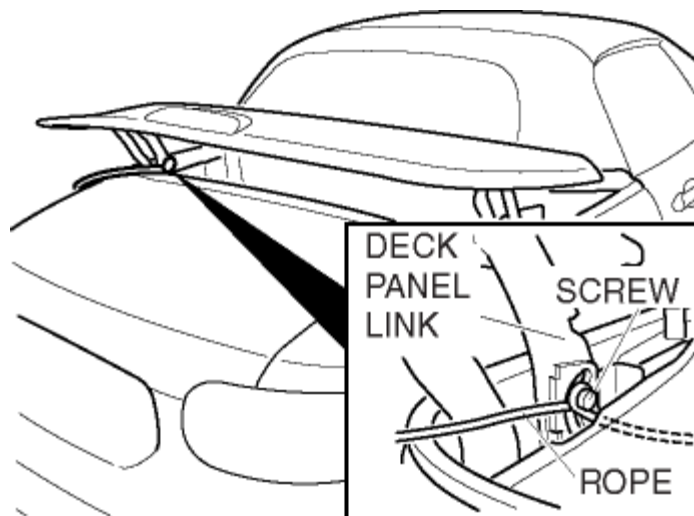
7. Lift up the deck panel from the both the left and right sides of the vehicle, one person on each side, to open the deck panel.

#### Close the deck panel (Temporary measure)

#### NOTE:

- If the deck panel needs to be opened/closed again or to drive the vehicle, perform the following temporary measure procedure.

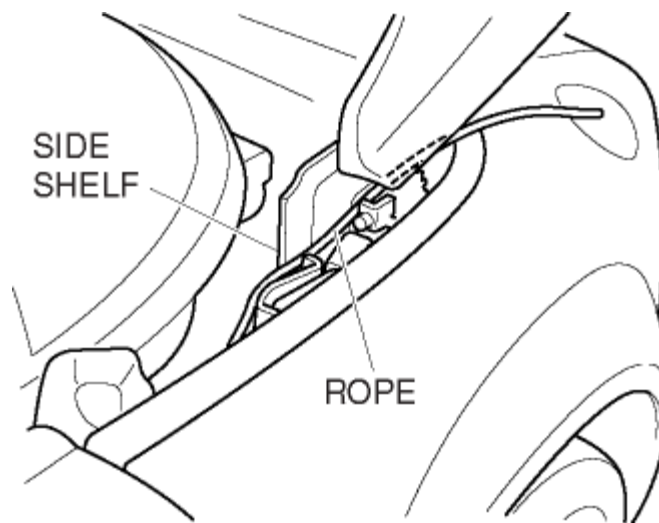
1. Double tie the rope to the deck panel link screw as shown in the figure.



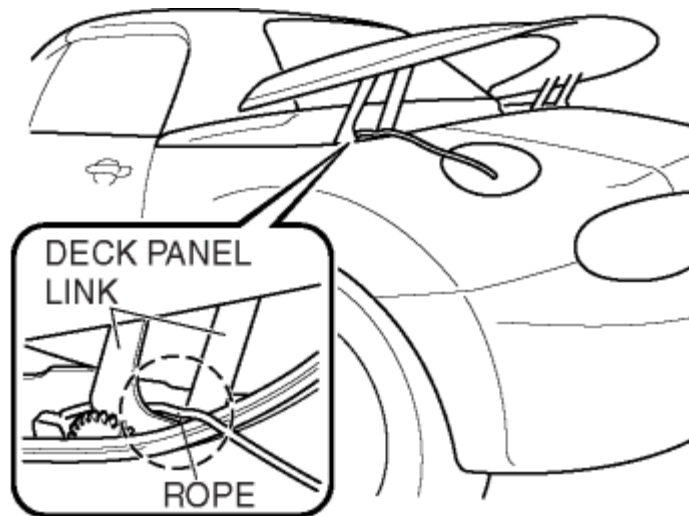
#### CAUTION:

- Tie the rope securely around the knob so that it does not loosen.

2. Route the rope on the vehicle's front side to the inside of the vehicle, passing it through the gap in the side shelf.

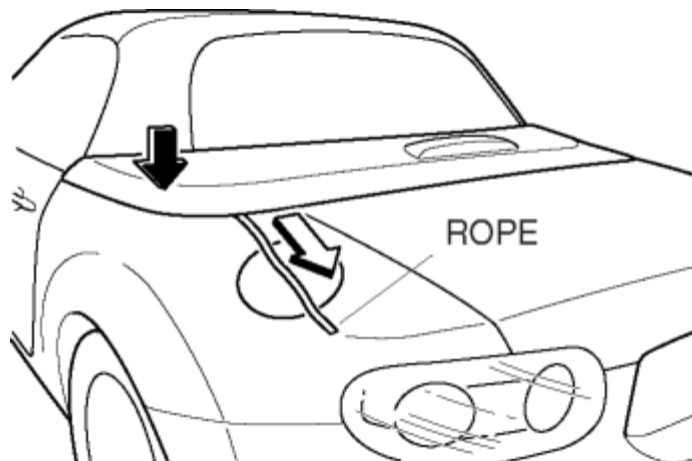


3. Route the rope on the vehicle's rear side to the outside of the vehicle, passing it between the deck panel links.

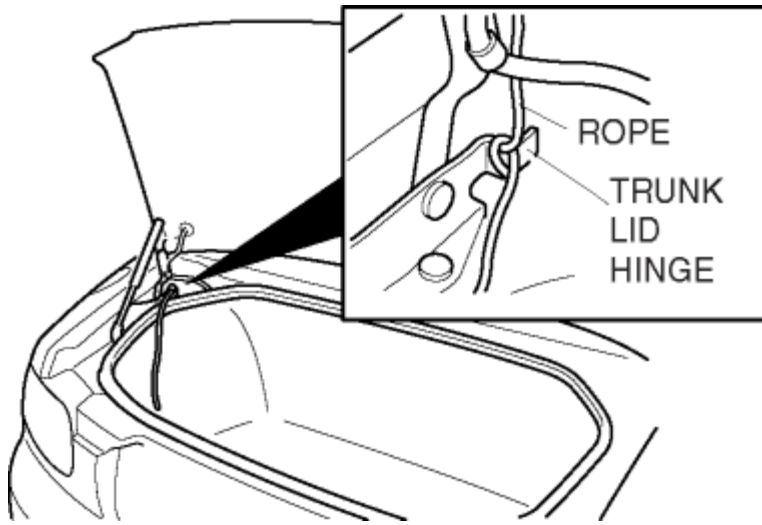


4. After doing the same procedure on the right side, close the deck panel from both the left and sides of the vehicle, one person on each side.

5. Pull the rope on the vehicle's rear (rope is outside of vehicle) along the trunk lid to engage and lock the sector gear and the lock pin of the deck panel base link.



6. Double tie the rope on the vehicle's rear side (rope is outside of vehicle) to the trunk lid hinge as shown in the figure.



**CAUTION:**

- Tie the rope on the trunk lid hinge to prevent the lock from releasing while driving. Tie the rope securely on the trunk lid hinge so that it does not loosen.

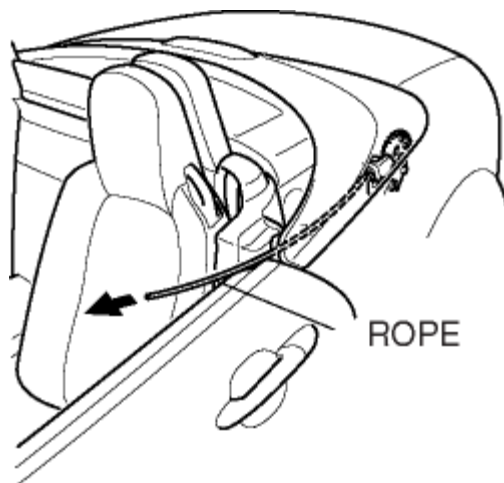
**Deck Panel Manual Open/Close Procedure After Temporary Measure**

**NOTE:**

- The temporary measure is for releasing the lock using a rope if the deck panel needs to be opened/closed again or to drive the vehicle after the deck panel manual open/close procedure has been performed. To open/close the deck panel manually on a vehicle where the temporary measure has already been performed, perform the following procedure and open/close the deck panel manually.

**Open the deck panel**

1. Pull the rope on the vehicle's front (rope is inside of vehicle) to disengage the sector gear and the lock pin of the deck panel base link.

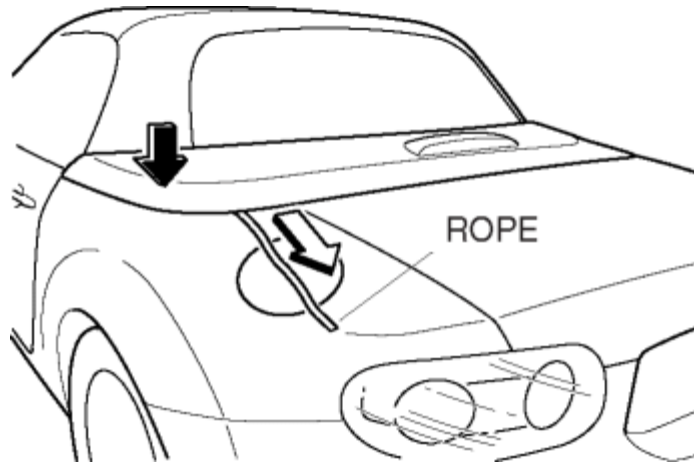


2. Lift up the deck panel from the both the left and right sides of the vehicle, one person on each side, to open the deck panel.

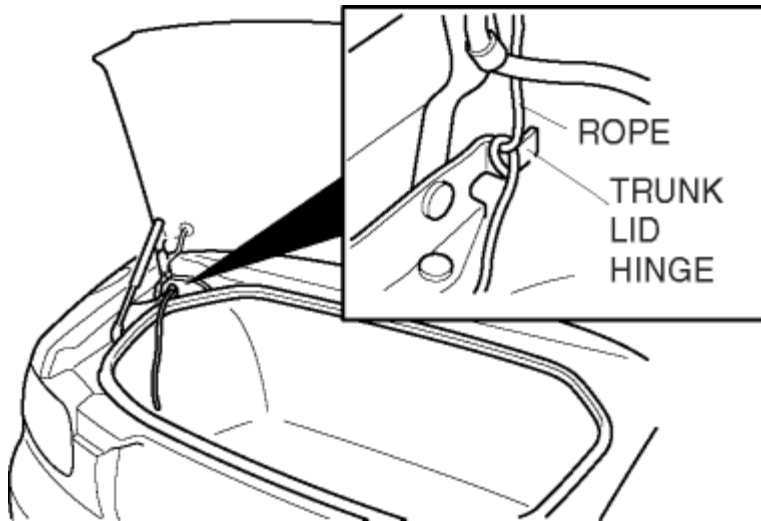
## Close the deck panel

### NOTE:

- If the deck panel needs to be opened/closed again or to drive the vehicle, perform the following procedure to close the deck panel.
1. Close the deck panel from both the left and right sides of the vehicle, one person on each side.
  2. Pull the rope on the vehicle's rear (rope is outside of vehicle) along the trunk lid to engage and lock the sector gear and the lock pin of the deck panel base link.



3. Double tie the rope on the vehicle's rear side (rope is outside of vehicle) to the trunk lid hinge as shown in the figure.



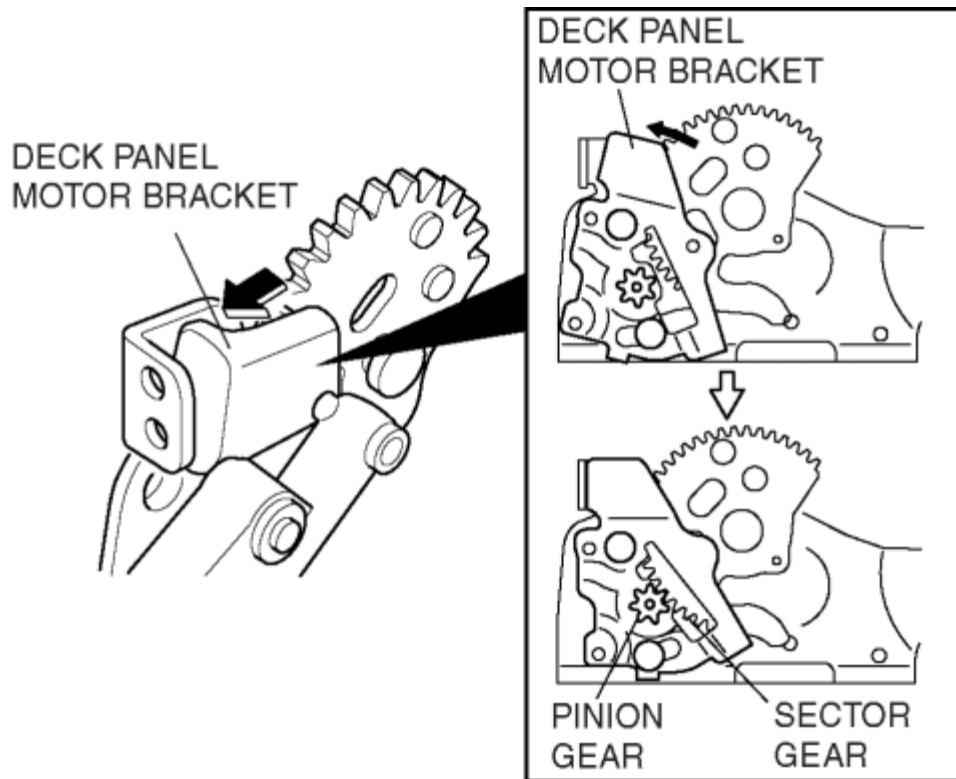
### CAUTION:

- Tie the rope on the trunk lid hinge to prevent the lock from releasing while driving. Tie the rope securely on the trunk lid hinge so that it does not loosen.

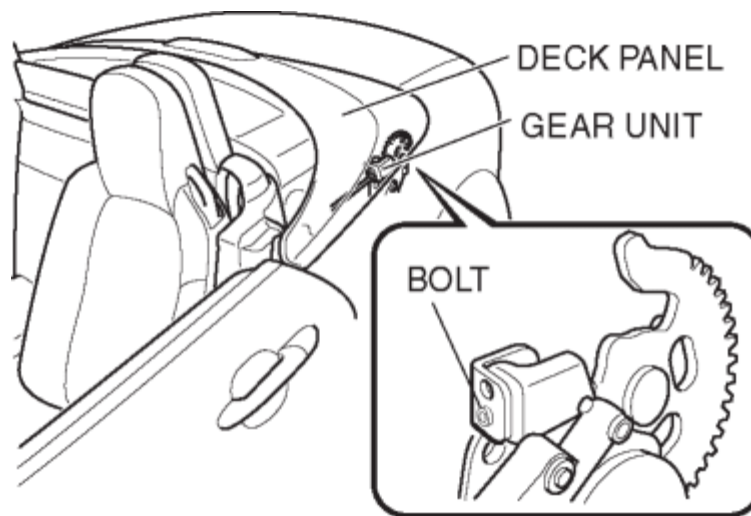
## Recovery Procedure

1. Fully open the deck panel.

2. Rotate the deck panel motor bracket in the direction of the arrow to engage the pinion gear (deck panel motor) and the sector gear.



3. Install the bolt.



**NOTE:**

- If the temporary measure is performed, remove the ropes.

**Deck Panel Manual Open/Close Procedure With The Roof Panel Fully Closed**

1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#))
2. Remove the aeroboard. (See [AEROBOARD REMOVAL/INSTALLATION.](#))
3. Peering from the space where the wind blocker was removed, remove both sides of the nuts shown in the figure.

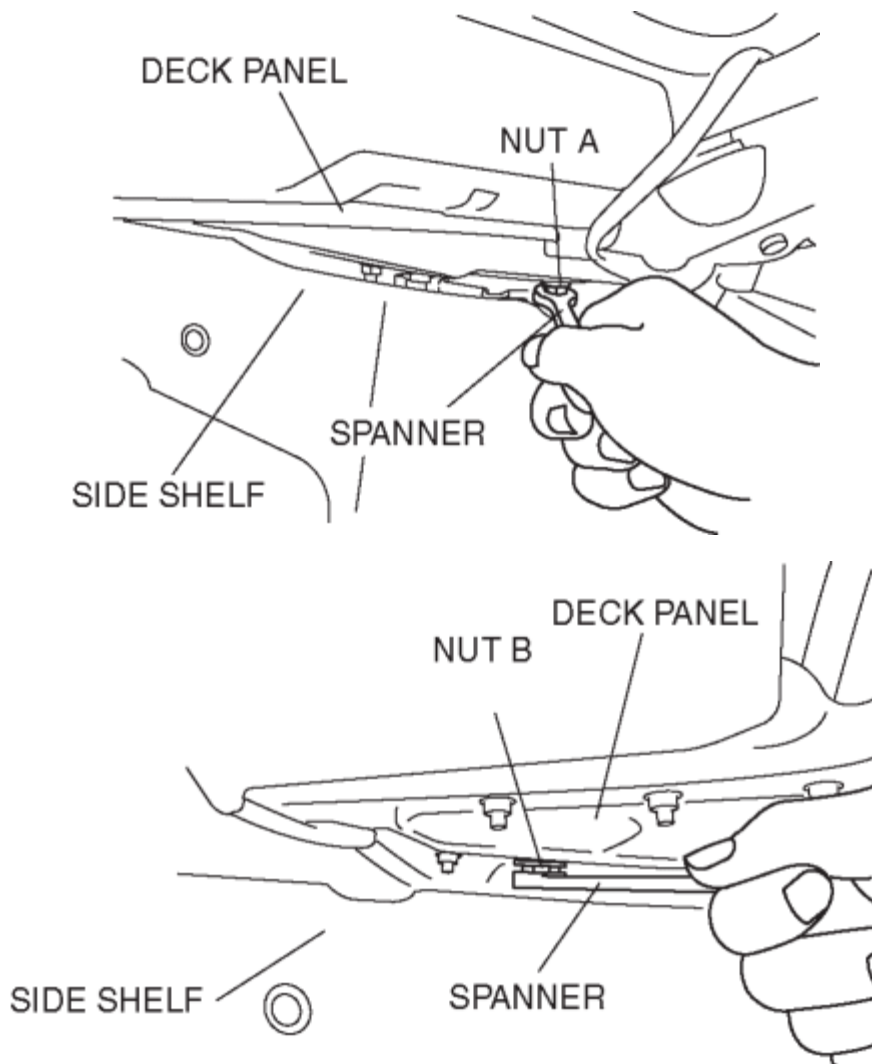
## NOTE:

- The number of shims varies depending on the location of the deck panel installation nuts. Adjustment will be easier by verifying the number of shims to be used before removing the deck panel.

4. Lift up the deck panel with one other person.
5. Disconnect the high-mount brake light connector on the left side by pulling it in the direction of (2) while pressing it in the direction of (1).
6. Remove the deck panel.

## Nut Removal Note

1. Insert a spanner into the clearance between the deck panel and side shelf, and remove the nuts.



## Deck Panel Recovery Procedure

1. Connect the negative battery cable.

2. Fully open the deck panel.
3. Install the deck panel. (See [DECK PANEL REMOVAL/INSTALLATION.](#))
4. Verify the deck panel clearance. (See [POWER RETRACTABLE HARDTOP ADJUSTMENT.](#))

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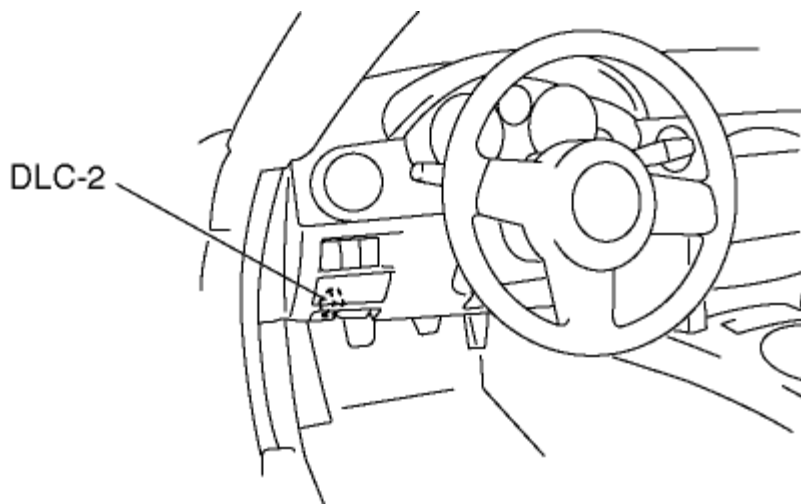
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## 2008 - MX-5 - Body and Accessories

### POWER RETRACTABLE HARDTOP OPEN/CLOSE WARNING BEEP ON/OFF SWITCHING

1. Connect the M-MDS to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  - Select "Module Programming".
- When using the PDS (Pocket PC)
  - Select "Programming".
  - Select "Module programming".

3. Then, select items from the screen menu in the following order.

- Select "Programmable Parameters".
- Select "Warning Lamps/Chimes".

4. Select the RHT buzzer (IC) on the M-MDS to set on/off.

#### Item

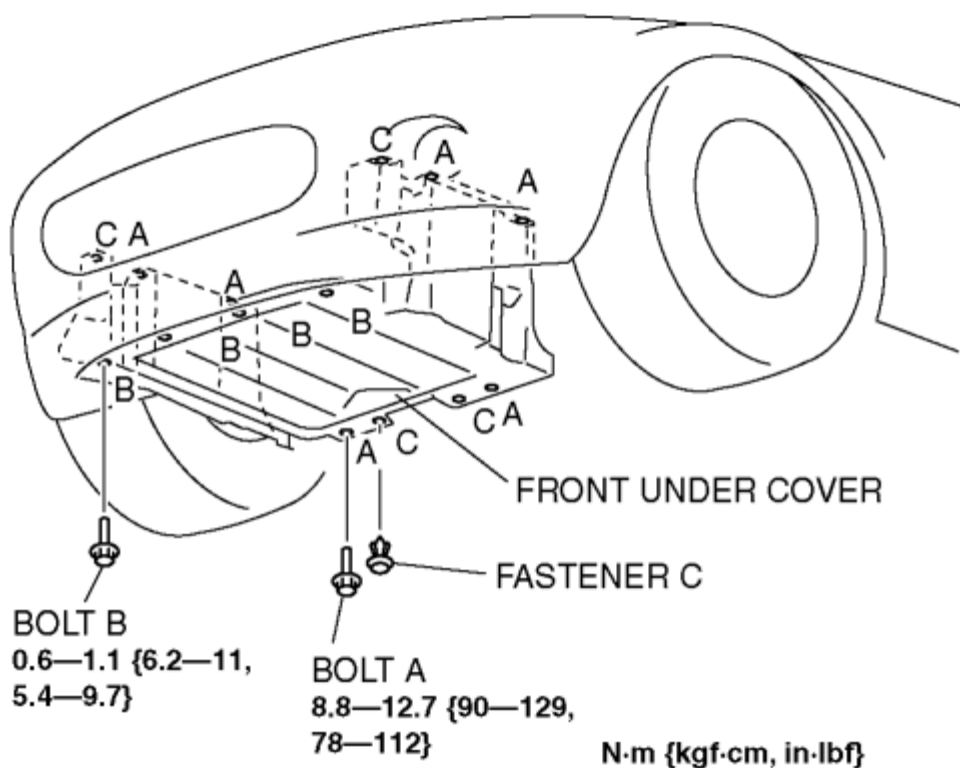
- RHT Buzzer - (IC)



## 2008 - MX-5 - Body and Accessories

### FRONT UNDER COVER REMOVAL/INSTALLATION

1. Remove the splash shield A. (See [SPLASH SHIELD REMOVAL/INSTALLATION](#).)
2. Remove the bolts A at section A shown in the figure.



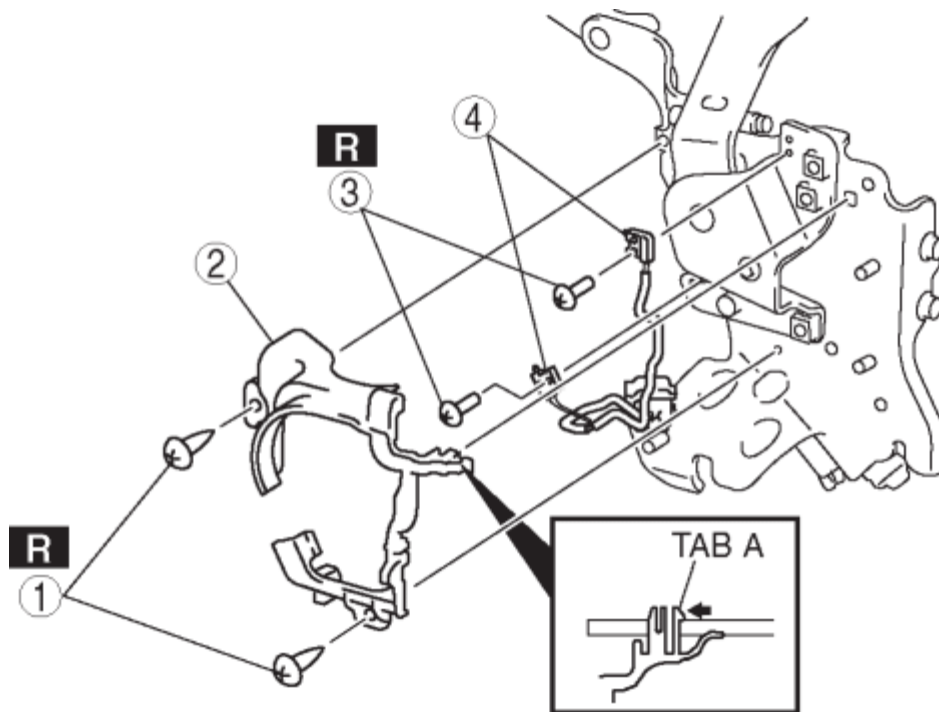
3. Remove the bolts B at section B shown in the figure.
4. Remove the fasteners C at section C shown in the figure.
5. Remove the front under cover.
6. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### POWER RETRACTABLE HARDTOP LIMIT SWITCH REMOVAL/INSTALLATION

#### NOTE:

- The power retractable hardtop limit switch is installed on the RH side.
1. Fully open the deck panel.
  2. Cover both sides of the rear window glass with thick cloth to protect the window.
  3. Remove the battery cover.
  4. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
  5. Remove the following parts:
    - a. Console (See [CONSOLE PANEL REMOVAL/INSTALLATION.](#))
    - b. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION.](#))
    - c. Scuff plate (See [SCUFF PLATE REMOVAL/INSTALLATION.](#))
    - d. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION.](#))
    - e. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION.](#))
    - f. Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION.](#))
    - g. Back trim (See [BACK TRIM REMOVAL/INSTALLATION.](#))
    - h. Seat belt upper anchor installation bolt (See [SEAT BELT REMOVAL/INSTALLATION.](#))
    - i. Power retractable hardtop link bracket (See [POWER RETRACTABLE HARDTOP LINK BRACKET REMOVAL/INSTALLATION.](#))
    - j. Cab-side weatherstrip (See [CONVERTIBLE TOP DISASSEMBLY/ASSEMBLY.](#))
  6. Disconnect the roof motor limit switch connector.
  7. Disconnect the power retractable hardtop drain hose. (See [POWER RETRACTABLE HARDTOP DRAIN HOSE REMOVAL/INSTALLATION.](#))
  8. Remove the power retractable hardtop. (See [POWER RETRACTABLE HARDTOP REMOVAL/INSTALLATION.](#))
  9. Remove in the order indicated in the table.

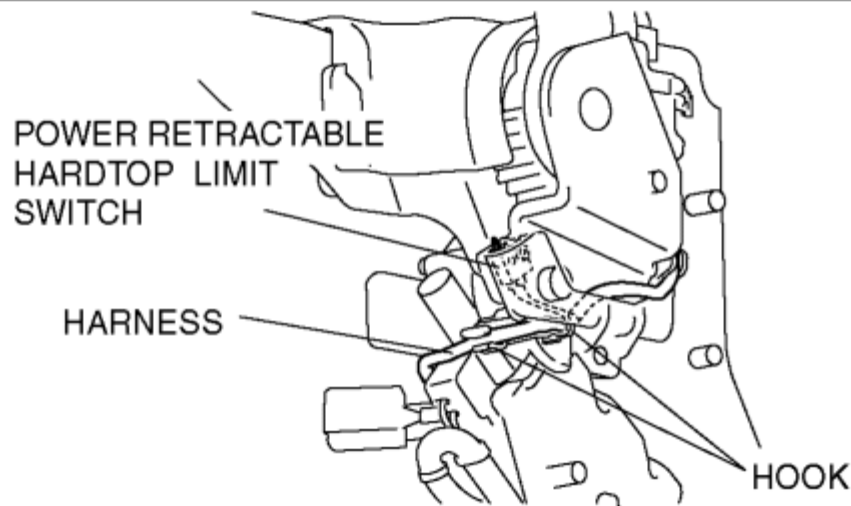
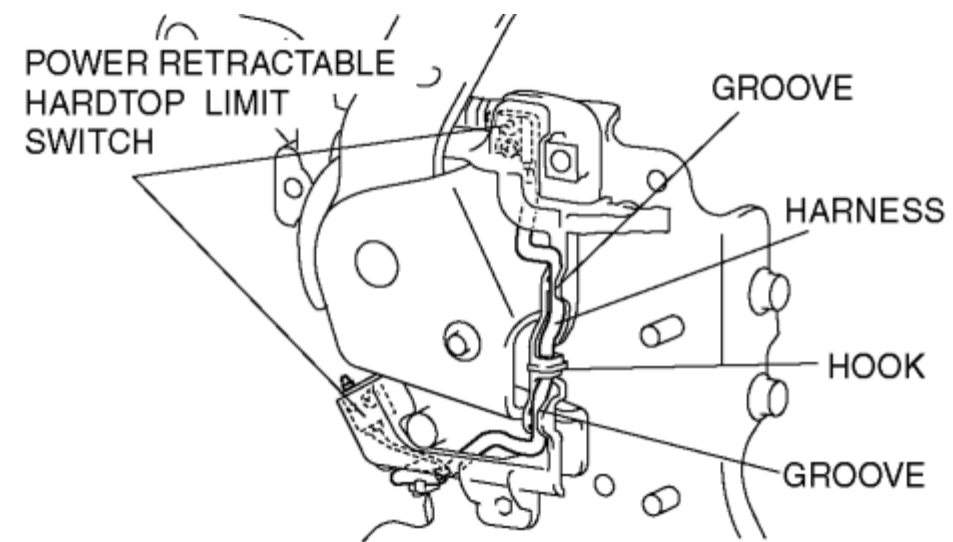


1	Screw A
2	Cover (See <a href="#">Cover Installation Note.</a> )
3	Screw B
4	Power retractable hardtop limit switch

10. Install in the reverse order of removal.

### Cover Installation Note

1. Install the power retractable hardtop limit switch wiring harness to the cover hook and groove shown in the figure.



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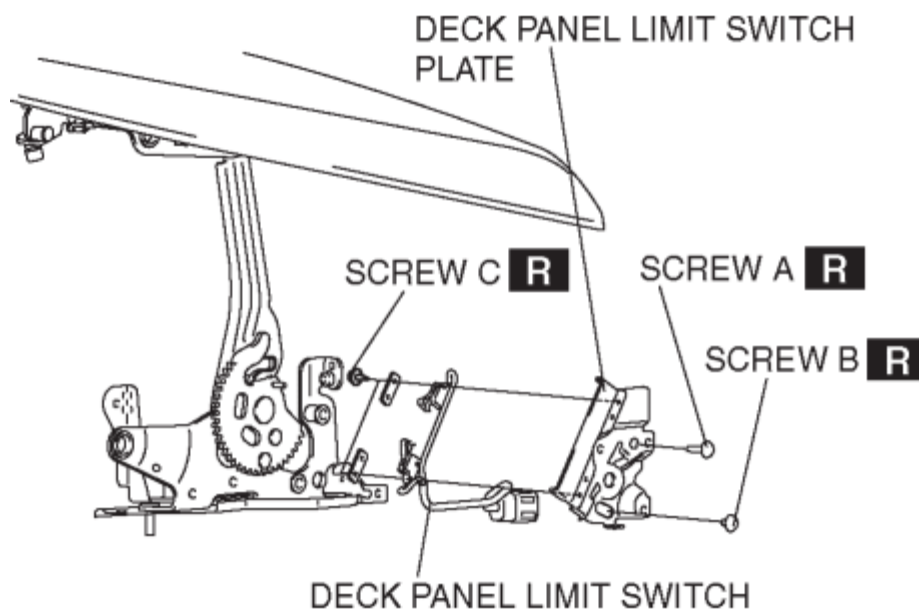
## 2008 - MX-5 - Body and Accessories

### DECK PANEL LIMIT SWITCH REMOVAL/INSTALLATION

#### CAUTION:

- If the deck panel does not operate electrically, see "DECK PANEL MANUAL OPEN/CLOSE PROCEDURE" to open/close the deck panel. (See [DECK PANEL MANUAL OPEN/CLOSE PROCEDURE](#).)

1. Fully open the deck panel.
2. Remove the battery cover.
3. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
4. Set the side shelf out of the way. (See [SIDE SHELF REMOVAL/INSTALLATION](#).)
5. Remove the deck panel. (See [DECK PANEL REMOVAL/INSTALLATION](#).)
6. Remove the deck panel motor. (RH) (See [DECK PANEL MOTOR REMOVAL/INSTALLATION](#).)
7. Remove the screws A and B.



8. Remove the deck panel limit switch plate.
9. Remove the screws C.
10. Remove the deck panel limit switch.
11. Install in the reverse order of removal.

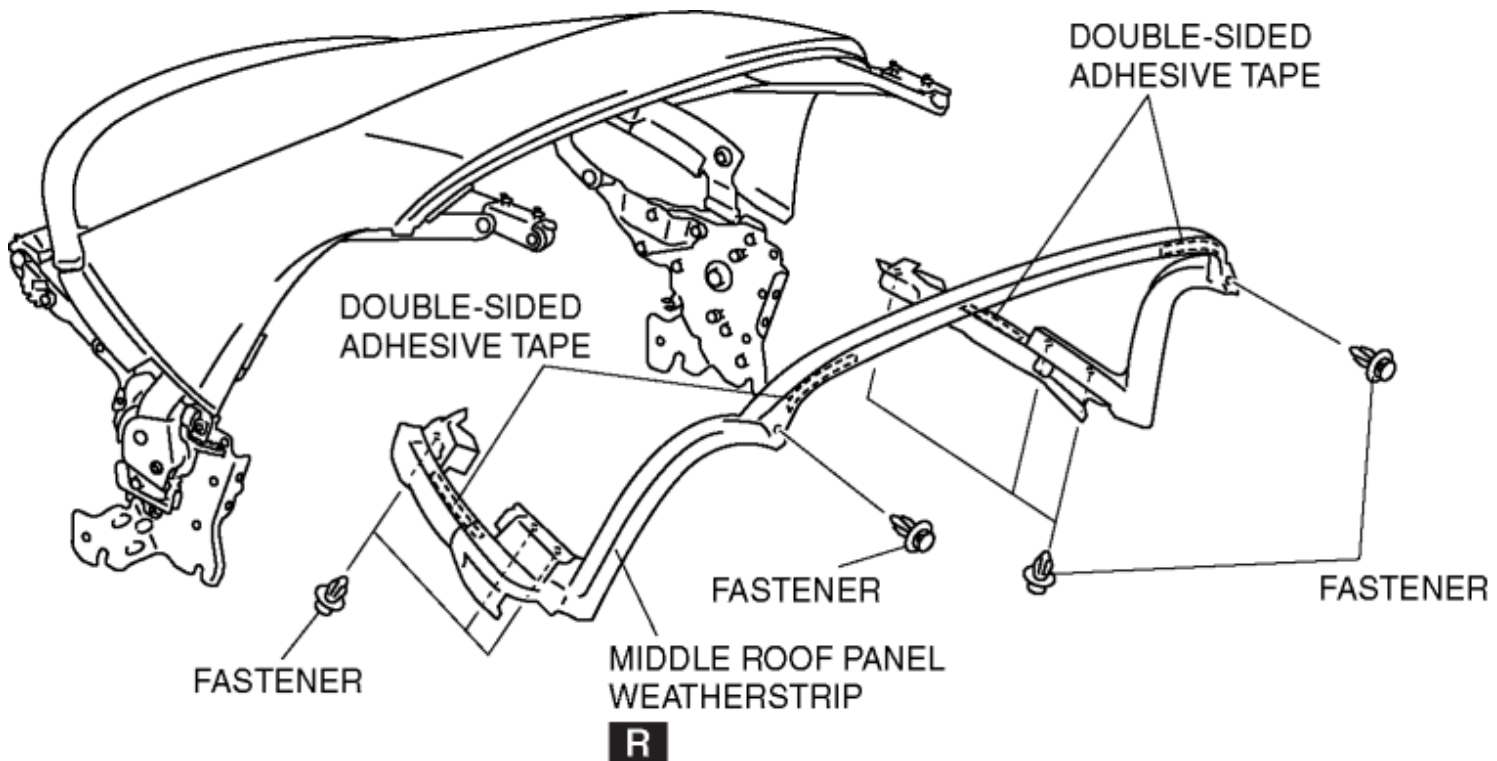


## 2008 - MX-5 - Body and Accessories

### MIDDLE ROOF PANEL WEATHERSTRIP REMOVAL/INSTALLATION

#### Removal

1. Remove the fasteners.



2. Peel off the double-sided adhesive tape.
3. Remove the middle roof panel weatherstrip.

#### Installation

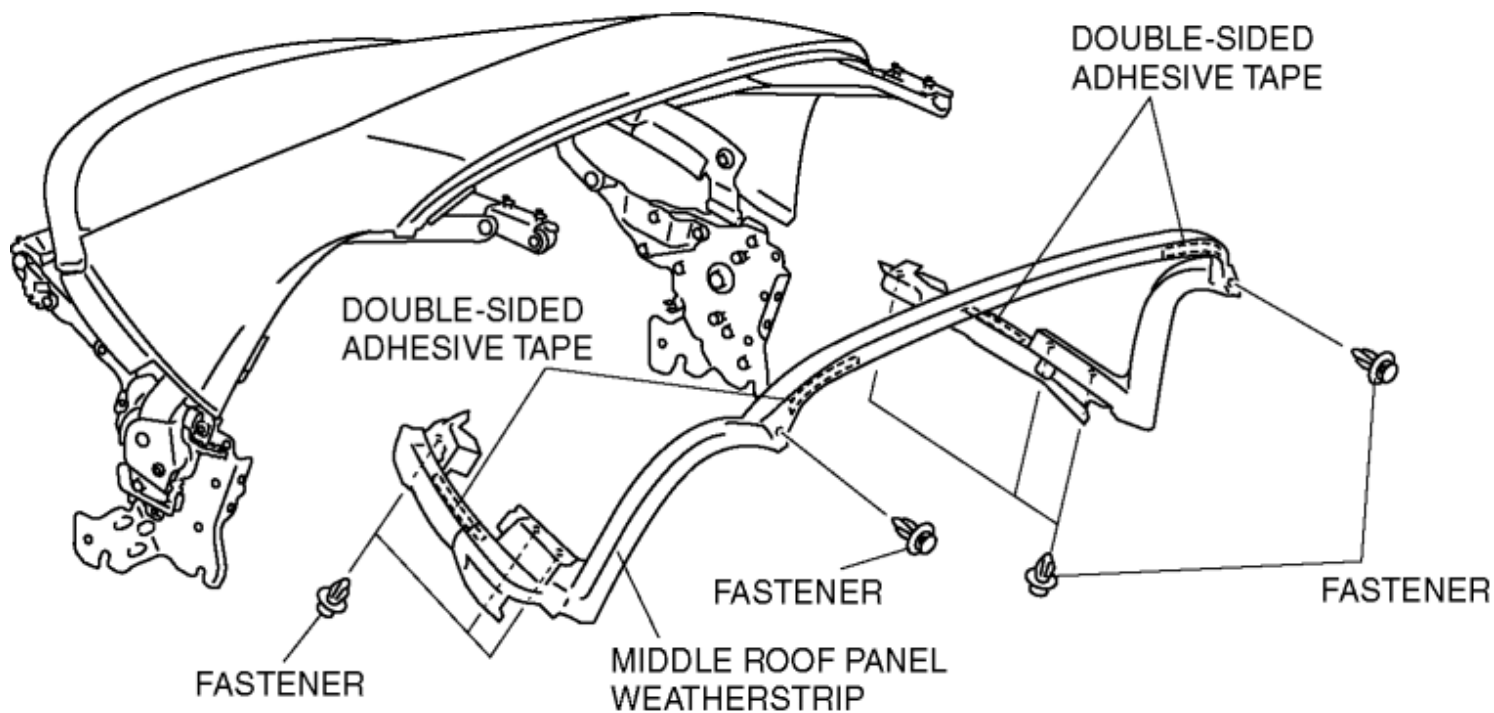
##### **WARNING:**

- Using a razor with bare hands can cause injury. Always wear gloves when using a razor.

##### **NOTE:**

- Double-sided adhesive tape has already been attached to the new middle roof panel weatherstrip.
1. Remove the double-sided adhesive tape on the middle roof panel using a utility knife.
  2. Remove any grease or dirt from the adhesion surface of the middle roof panel.

3. Install the fasteners.



4. Peel off the tape backings and attach the weatherstrip by applying pressure.

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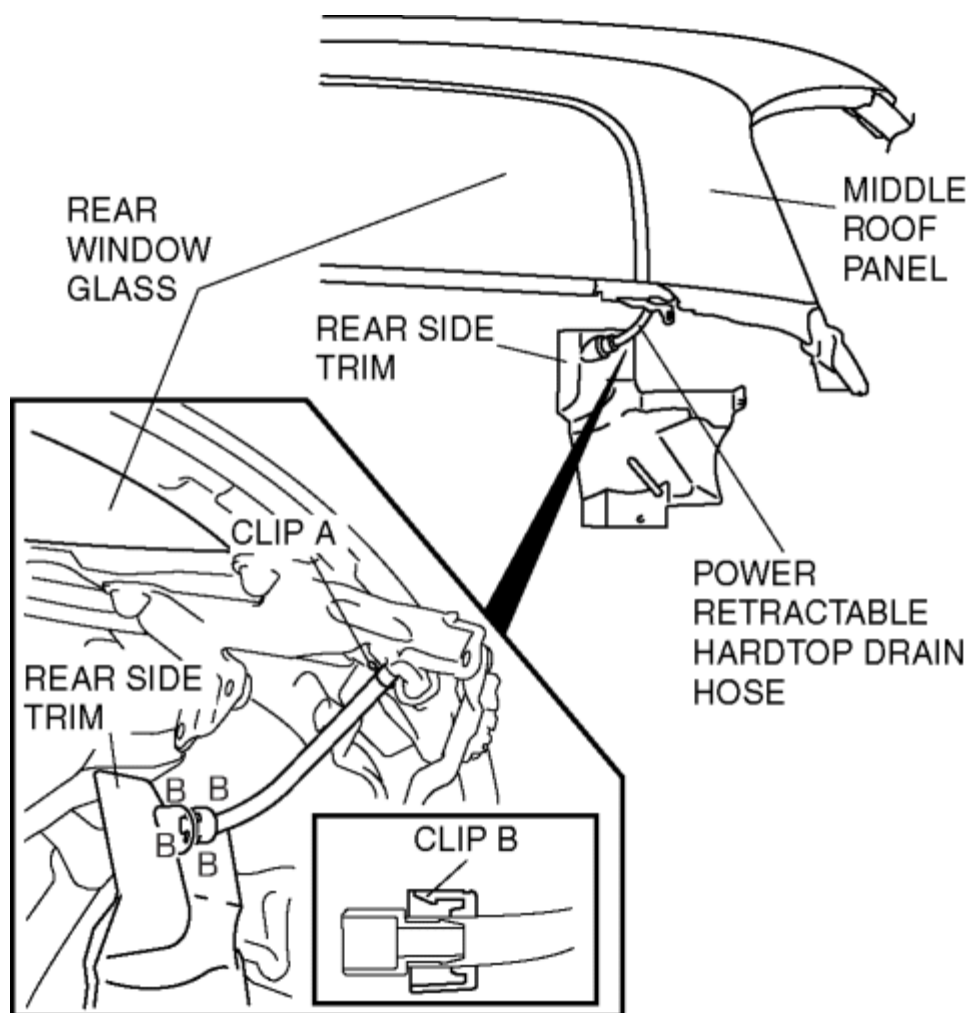
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## 2008 - MX-5 - Body and Accessories

### POWER RETRACTABLE HARDTOP DRAIN HOSE REMOVAL/INSTALLATION

1. Fully close the power retractable hardtop.
2. Fully open the deck panel.
3. Remove clip A, and remove the power retractable hardtop drain hose from the rear window glass.

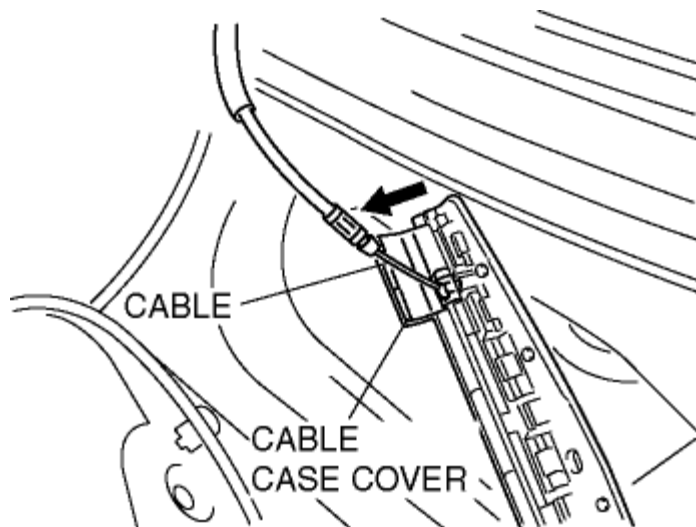


4. Insert your hand from the fully opened deck panel and remove clip B, and remove the power retractable hardtop drain hose from the rear side trim.
5. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### ROOF HOOK CABLE REMOVAL/INSTALLATION

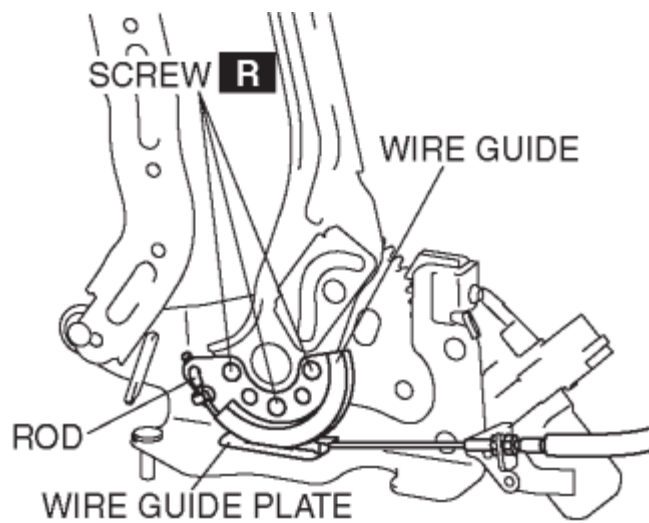
1. Fully open the deck panel.
2. Remove the following parts:
  - a. Console (See [CONSOLE PANEL REMOVAL/INSTALLATION.](#))
  - b. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION.](#))
  - c. Scuff plate (See [SCUFF PLATE REMOVAL/INSTALLATION.](#))
  - d. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION.](#))
  - e. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION.](#))
  - f. Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION.](#))
  - g. Back trim (See [BACK TRIM REMOVAL/INSTALLATION.](#))
3. Open the cable case cover and disconnect the cable while pressing the cable in the direction of the arrow. (See [Roof Hook Install Note.](#))



4. Set the side shelf out of the way. (See [SIDE SHELF REMOVAL/INSTALLATION.](#))
5. Insert a Phillips screwdriver with no wear securely into each screw groove and remove the screws.

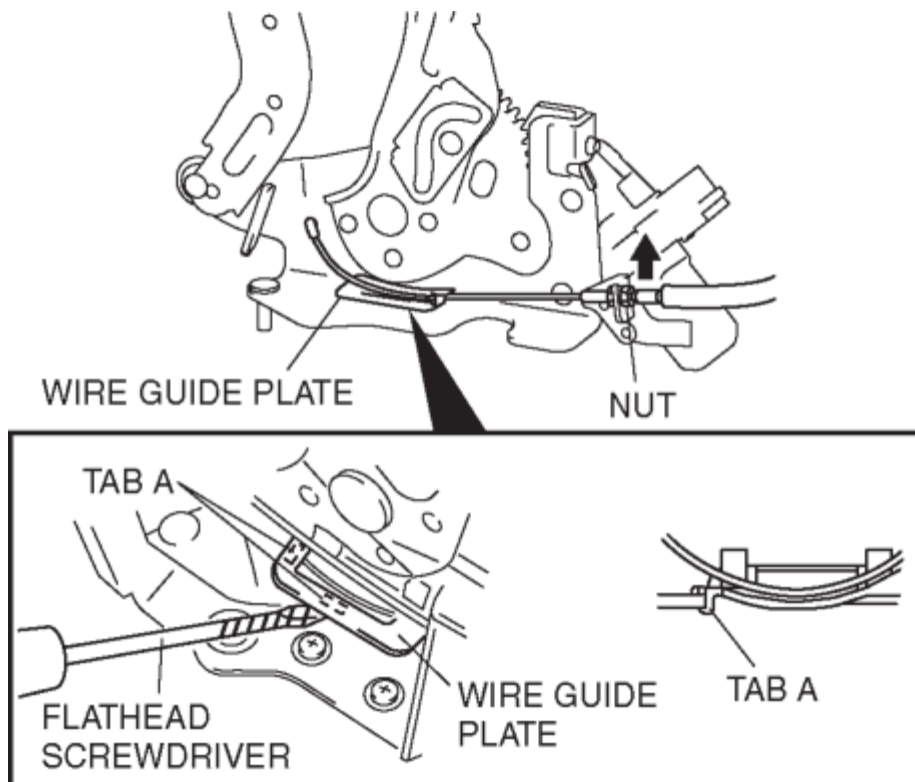
#### CAUTION:

- The screws are engaged firmly because thread-locking compound has been applied to them. When removing the screws, be careful not to deform the screw groove.



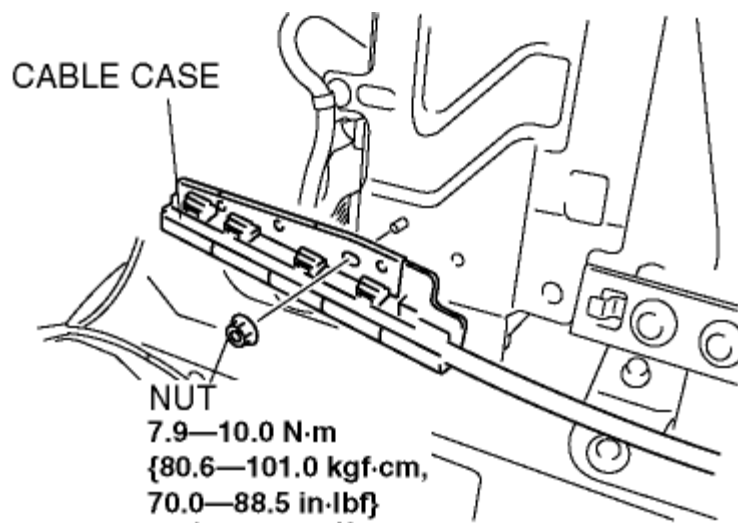
6. Remove the rod from the wire guide.

7. Remove tabs A using a tape-wrapped flathead screwdriver, and then remove the wire guide plate.



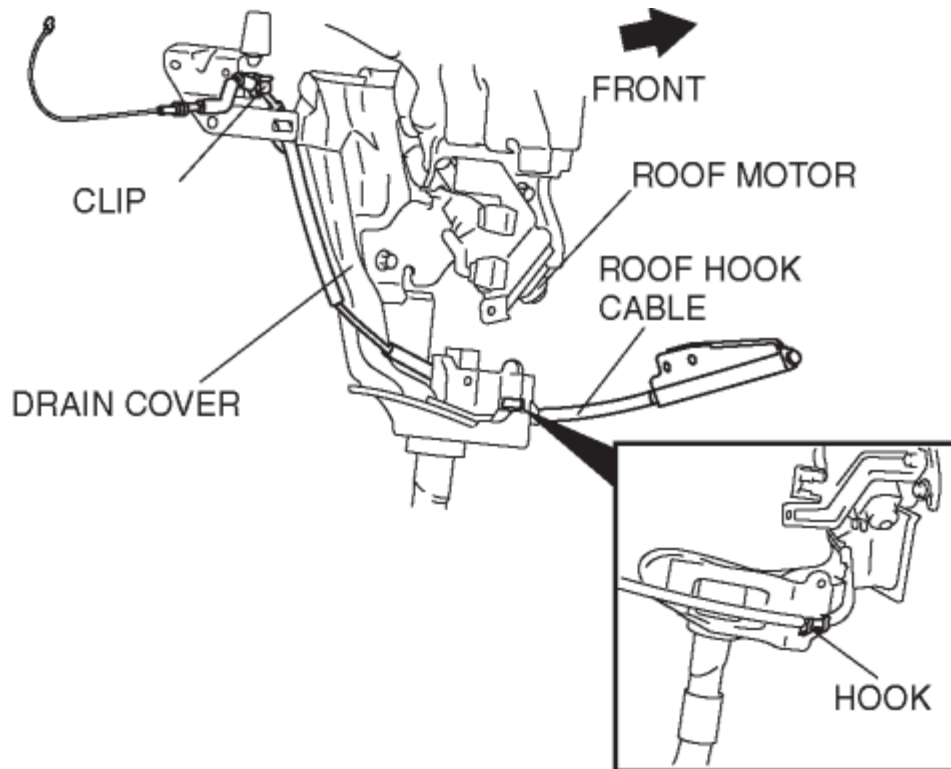
8. Loosen the nut, then pull the roof hook cable in the direction shown by the arrow and remove it.

9. Remove the nut.



10. Remove the cable case.

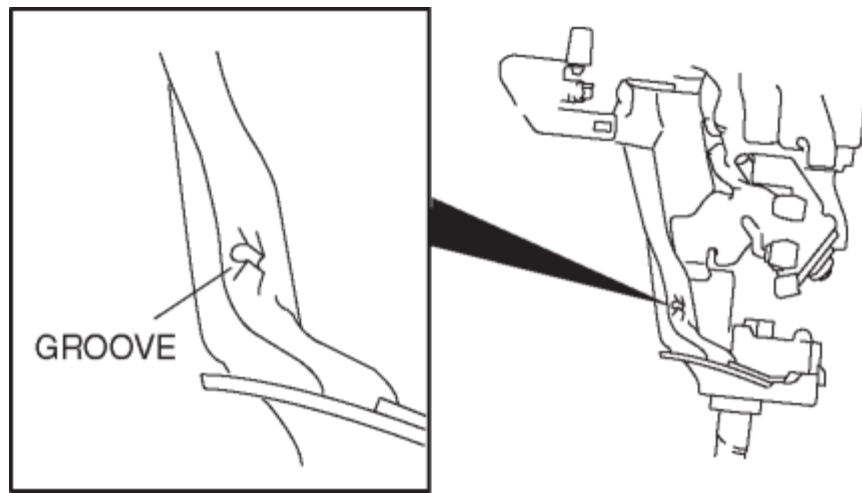
11. Remove the roof hook cable from the hook and clip shown in the figure.



12. Install in the reverse order of removal.

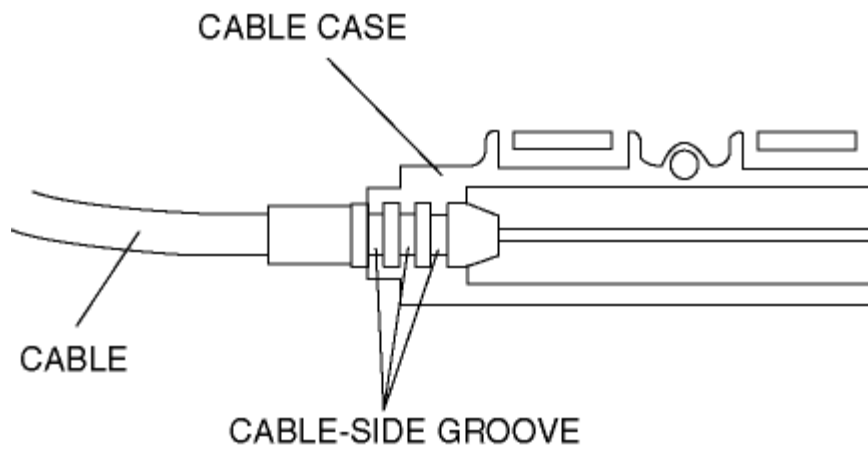
#### CAUTION:

- If the roof hook cable is installed to the installation groove on the drain cover, it may become a source of noise during deck panel operation. Do not install it even if there is an installation groove on the drain cover.



### Roof Hook Install Note

1. Securely fix the 3 grooves to the cable case.



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## 2008 - MX-5 - Body and Accessories

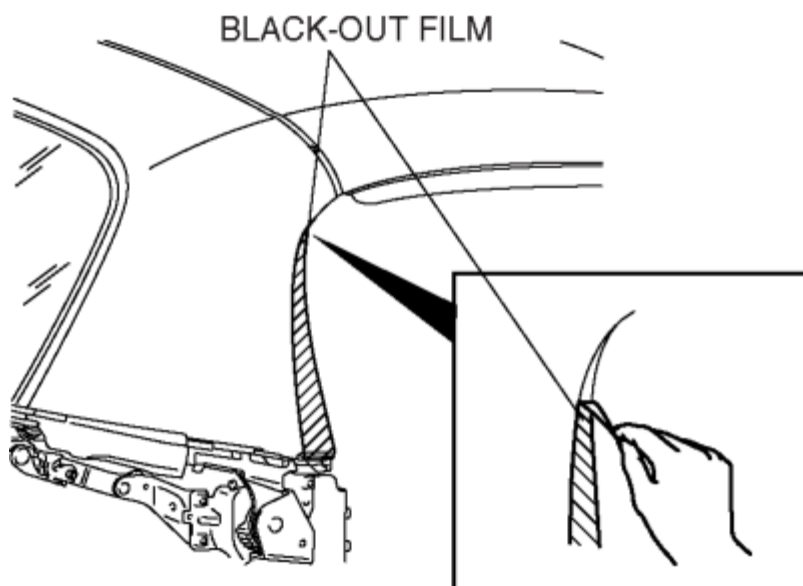
### BLACK-OUT FILM REMOVAL

#### Applied VIN (assumed)

- JM1 NC15F\*8# 100001—156263
- JM1 NC16F\*8# 100001—156260
- JM1 NC25F\*8# 100001—156239
- JM1 NC26F\*8# 100001—156244

#### Front

1. Partially peel back the middle roof weatherstrip.
2. Peel off the black-out film by pulling it outward from one end.

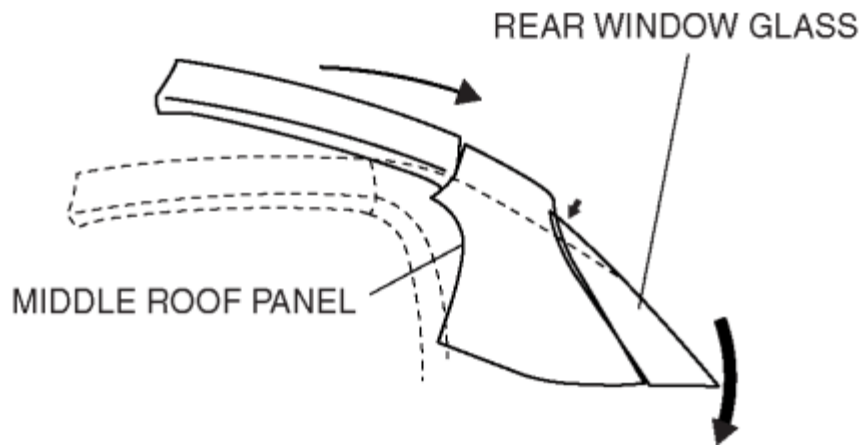


#### NOTE:

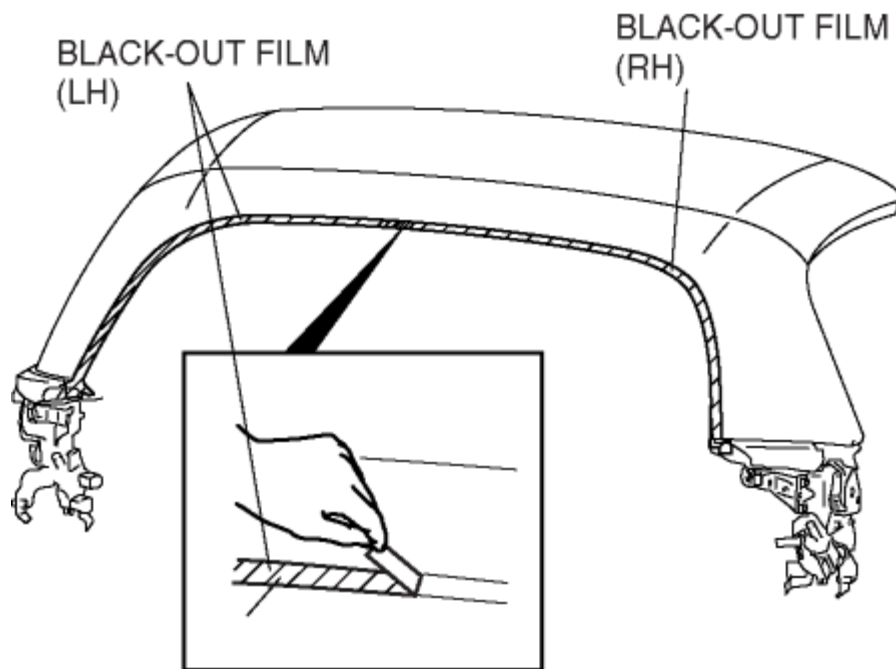
- Slowly remove the black-out film since it may tear easily.

#### Rear

1. Move the power retractable hardtop in the open direction as shown in the figure until it is separated from the middle roof panel.



2. Peel off the black-out film by pulling it outward from one end.



#### NOTE:

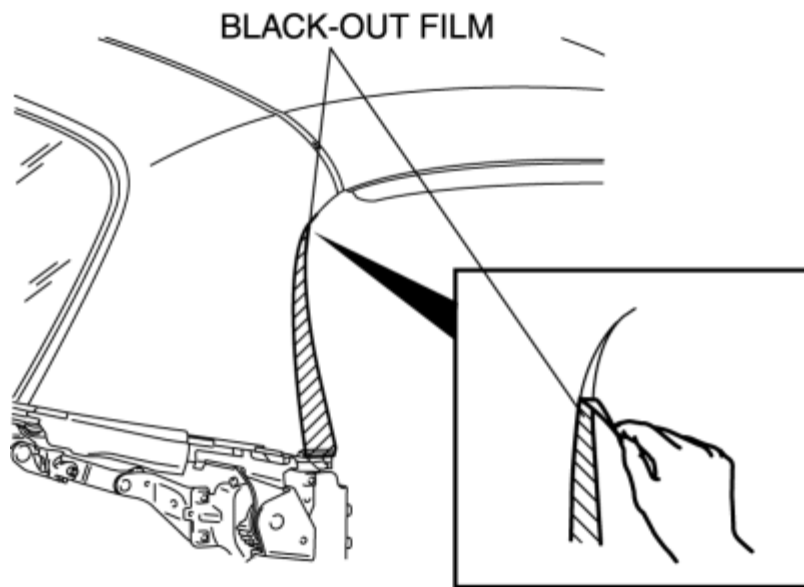
- Slowly remove the black-out film since it may tear easily.

#### Applied VIN (assumed)

- JM1 NC15F\*8# 156264—
- JM1 NC16F\*8# 156261—
- JM1 NC25F\*8# 156240—
- JM1 NC26F\*8# 156245—

#### Front

1. Partially peel back the middle roof weatherstrip.
2. Peel off the black-out film by pulling it outward from one end.

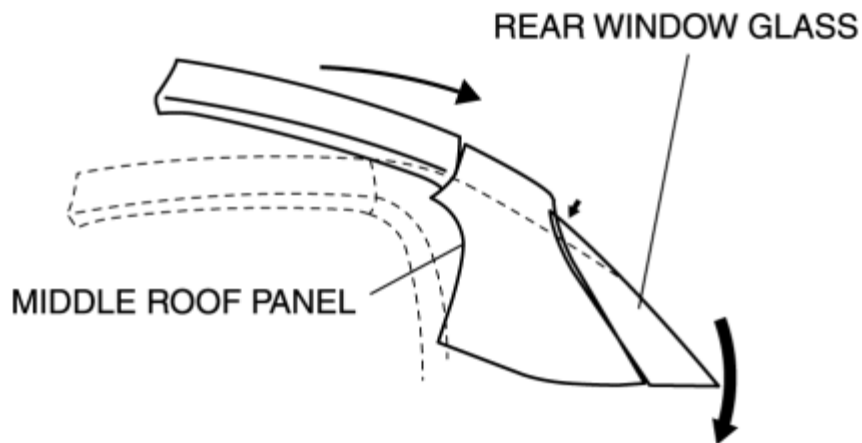


**NOTE:**

1. Slowly remove the black-out film since it may tear easily.

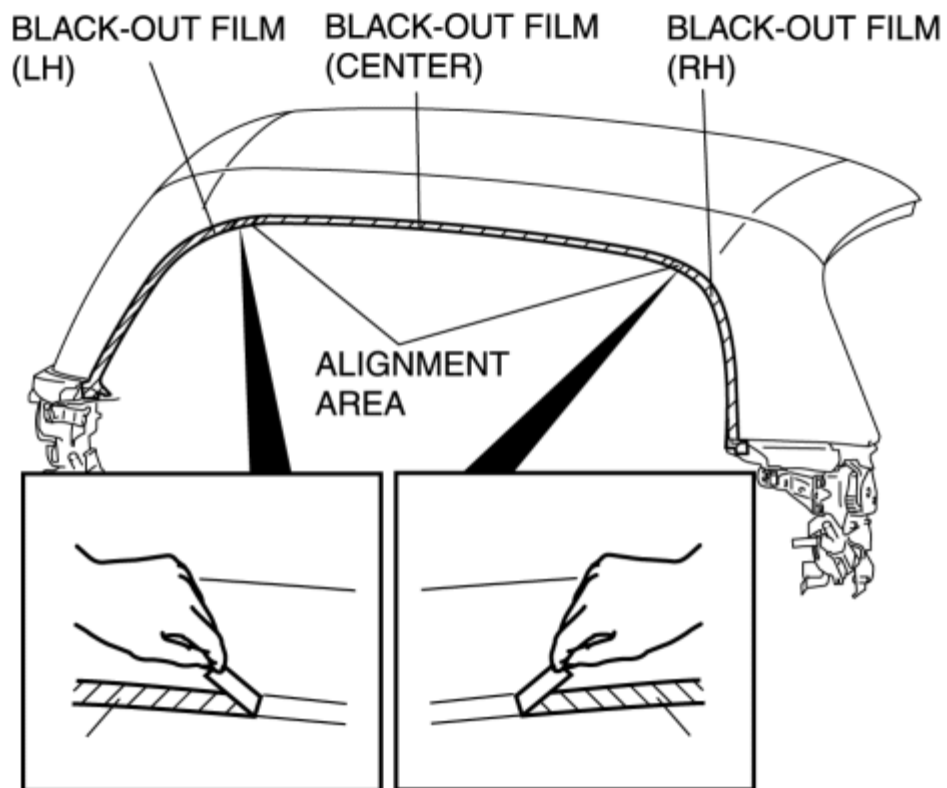
**Rear**

1. Move the power retractable hardtop in the open direction as shown in the figure until it is separated from the middle roof panel.



2. Peel off the black-out film by pulling it outward from one end.





**NOTE:**

1. Slowly remove the black-out film since it may tear easily.

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## 2008 - MX-5 - Body and Accessories

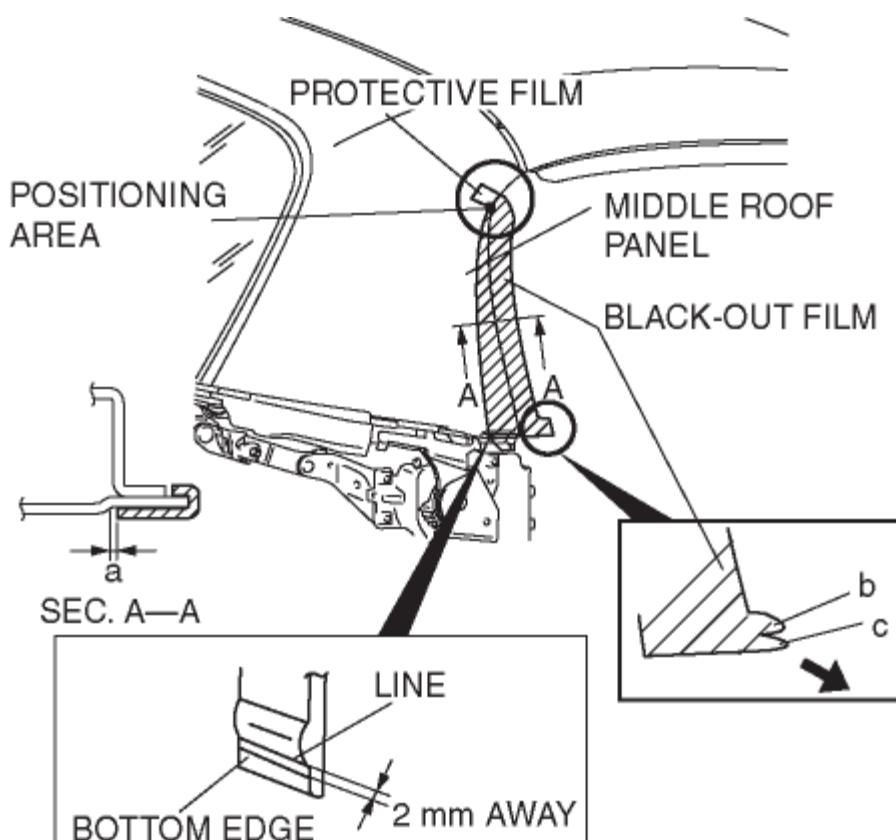
### BLACK-OUT FILM INSTALLATION

#### Applied VIN (assumed)

- JM1 NC15F\*8# 100001—156263
- JM1 NC16F\*8# 100001—156260
- JM1 NC25F\*8# 100001—156239
- JM1 NC26F\*8# 100001—156244

#### Front

1. Remove any grease or dirt from the affixing surface of the middle roof panel.
2. Peel off the tape backing from the upper area **50-100 mm**, and adhere the black-out film to the positioning point shown in the figure.



#### Clearance

- a: 0—2.0 mm {0—0.078 in}

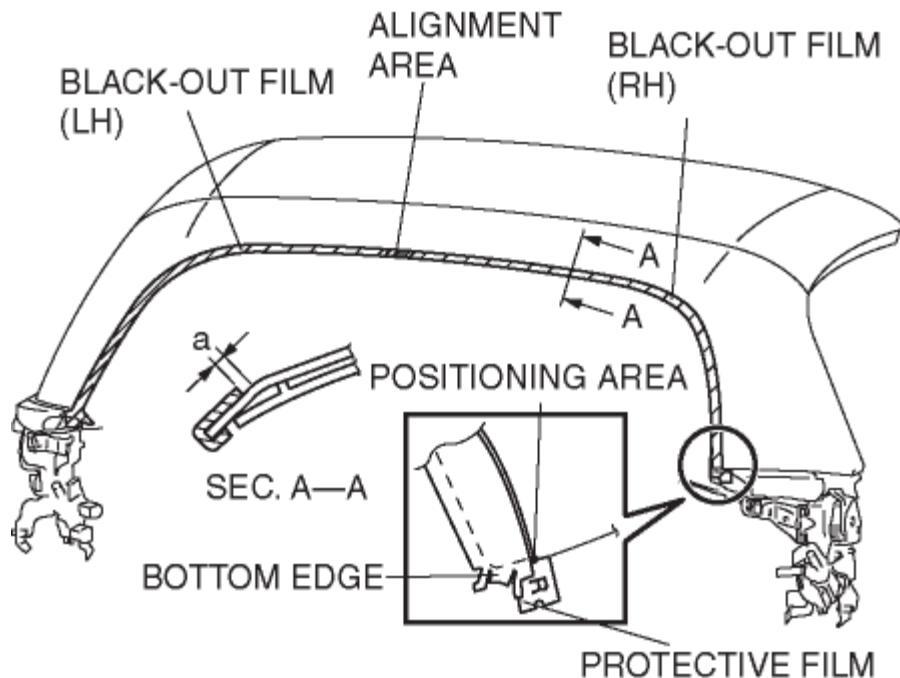
3. Peel off the tape backing, and after verifying that the bottom edge is positioned within **2 mm**

from the line shown in the figure, adhere the surface of the black-out film.

4. Peel off the transparent protective film on the black-out film.
5. Apply pressure to the black-out film in the order of side and back side.
6. Grasp edges b, c and pull in the direction shown by the arrow making sure there are no wrinkles in the corner area, and adhere.
7. Install the middle roof panel weatherstrip. (See [MIDDLE ROOF PANEL WEATHERSTRIP REMOVAL/INSTALLATION.](#))

## Rear

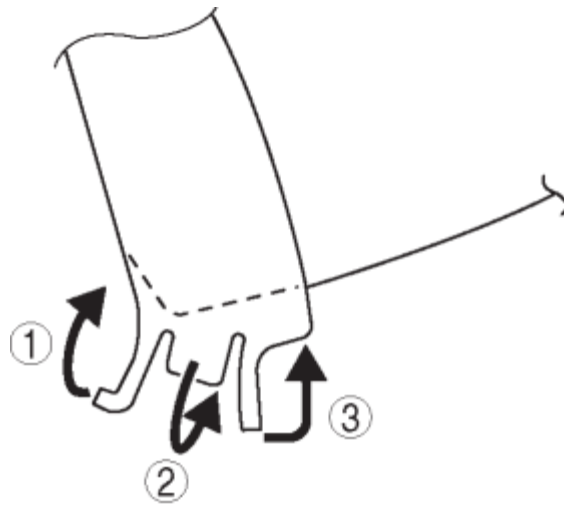
1. Remove any grease or dirt from the affixing surface of the middle roof panel.
2. Peel off the tape backing from the upper area **50-100 mm**, and adhere the black-out film to the positioning point shown in the figure.



### Clearance

- a: 0—3.0 mm {0—0.118 in}

3. Peel off the tape backing and adhere the black-out film surface.
4. Peel off the transparent protective film on the black-out film.
5. Apply pressure to the black-out film in the order of side and back side.
6. Fold in the edges in the order shown in the figure.



7. Attach the black out film (LH) using the same procedure as the black out film (RH).

**CAUTION:**

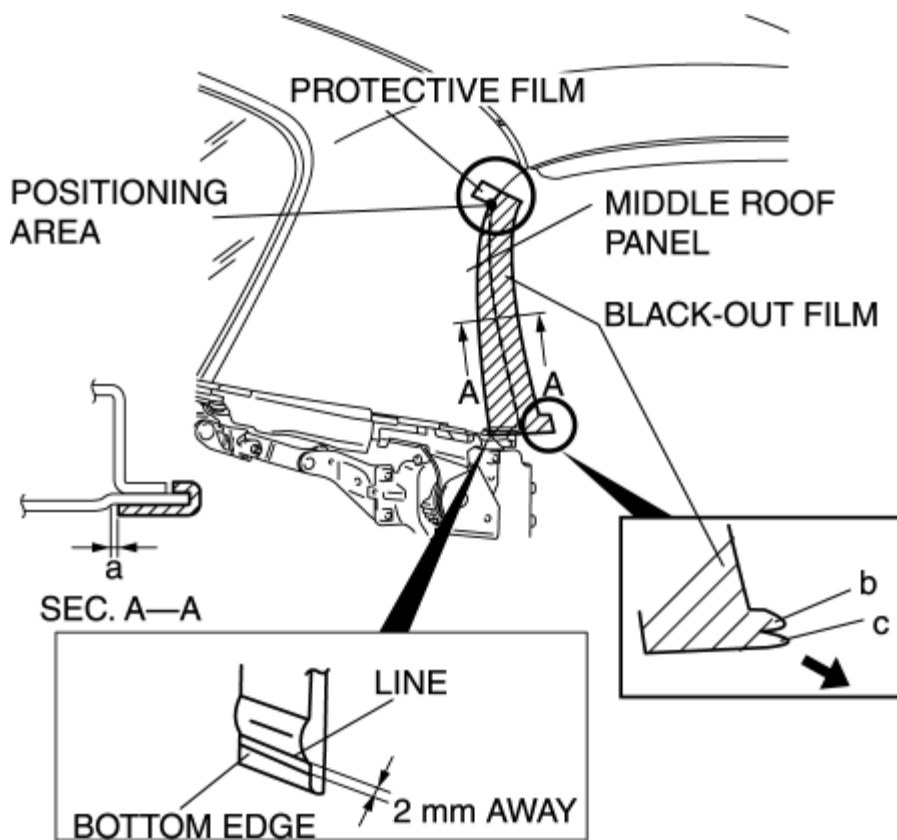
- Adhere so that the center edge of the black-out film (RH) is underneath the center edge of the black-out film (LH) in the center alignment area, with no deviation.

**Applied VIN (assumed)**

- JM1 NC15F\*8# 156264—
- JM1 NC16F\*8# 156261—
- JM1 NC25F\*8# 156240—
- JM1 NC26F\*8# 156245—

**Front**

1. Remove any grease or dirt from the affixing surface of the middle roof panel.
2. Peel off the tape backing from the upper area **50-100 mm**, and adhere the black-out film to the positioning point shown in the figure.



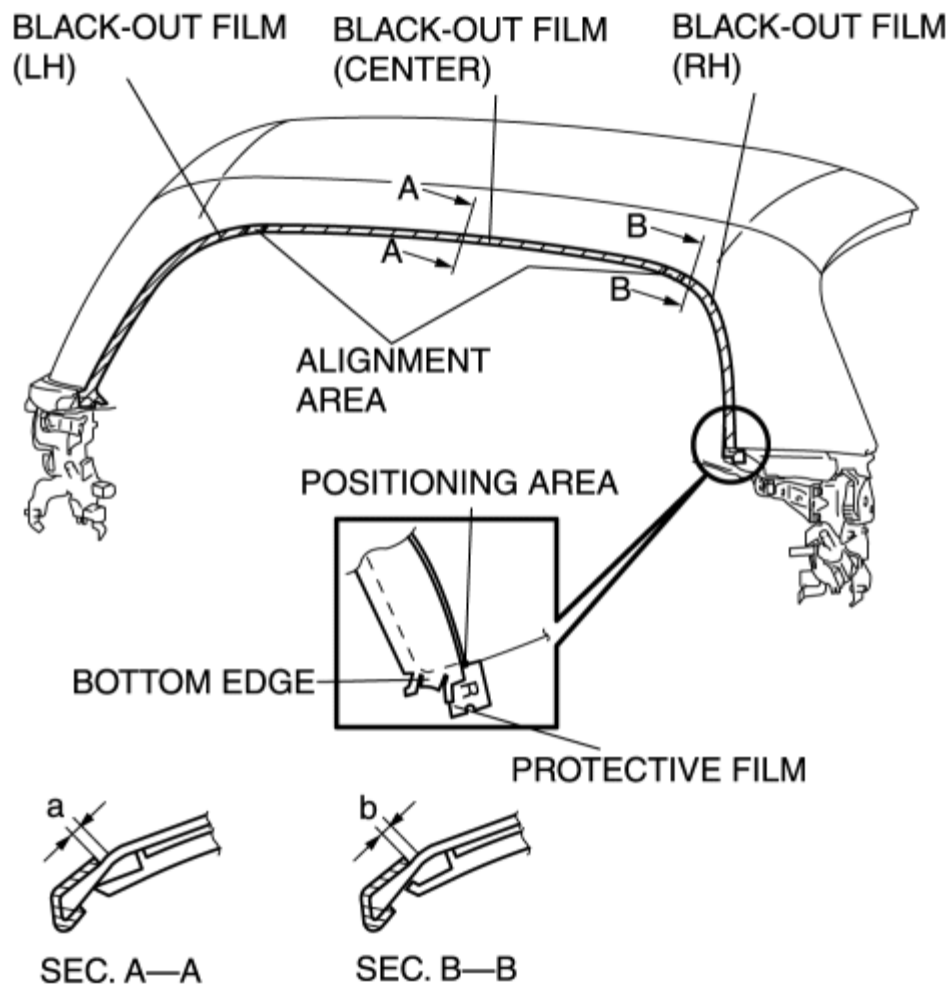
#### Clearance

- a: 0—2.0 mm {0—0.078 in}

3. Peel off the tape backing, and after verifying that the bottom edge is positioned within **2 mm** from the line shown in the figure, adhere the surface of the black-out film.
4. Peel off the transparent protective film on the black-out film.
5. Apply pressure to the black-out film in the order of side and back side.
6. Grasp edges b, c and pull in the direction shown by the arrow making sure there are no wrinkles in the corner area, and adhere.
7. Install the middle roof panel weatherstrip. (See [MIDDLE ROOF PANEL WEATHERSTRIP REMOVAL/INSTALLATION](#).)

#### Rear

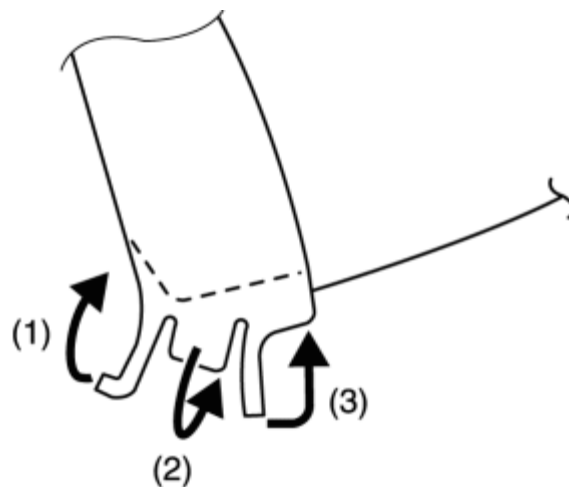
1. Remove any grease or dirt from the affixing surface of the middle roof panel.
2. Peel off the tape backing from the upper area **50-100 mm**, and adhere the black-out film to the positioning point shown in the figure.



#### Clearance

- a: 0—2.0 mm {0—0.078 in}
- b: 0—3.0 mm {0—0.118 in}

3. Peel off the tape backing and adhere the black-out film surface.
4. Peel off the transparent protective film on the black-out film.
5. Apply pressure to the black-out film in the order of side and back side.
6. Fold in the edges in the order shown in the figure.



7. Attach the black-out film (RH) and black-out film (LH) using the same procedure as the black-out film (center).

**CAUTION:**

- Adhere so that the center edge of the black-out film (RH) and black-out film (LH) are underneath the edge of the black-out film (center) in the alignment area, with no deviation.

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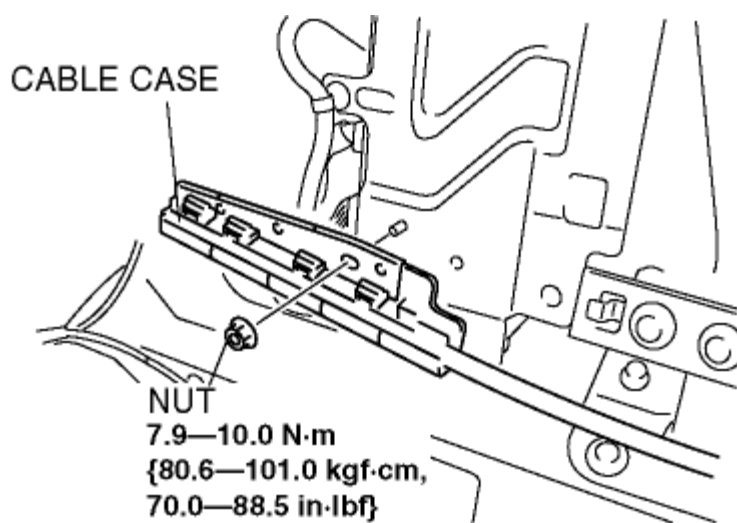
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## 2008 - MX-5 - Body and Accessories

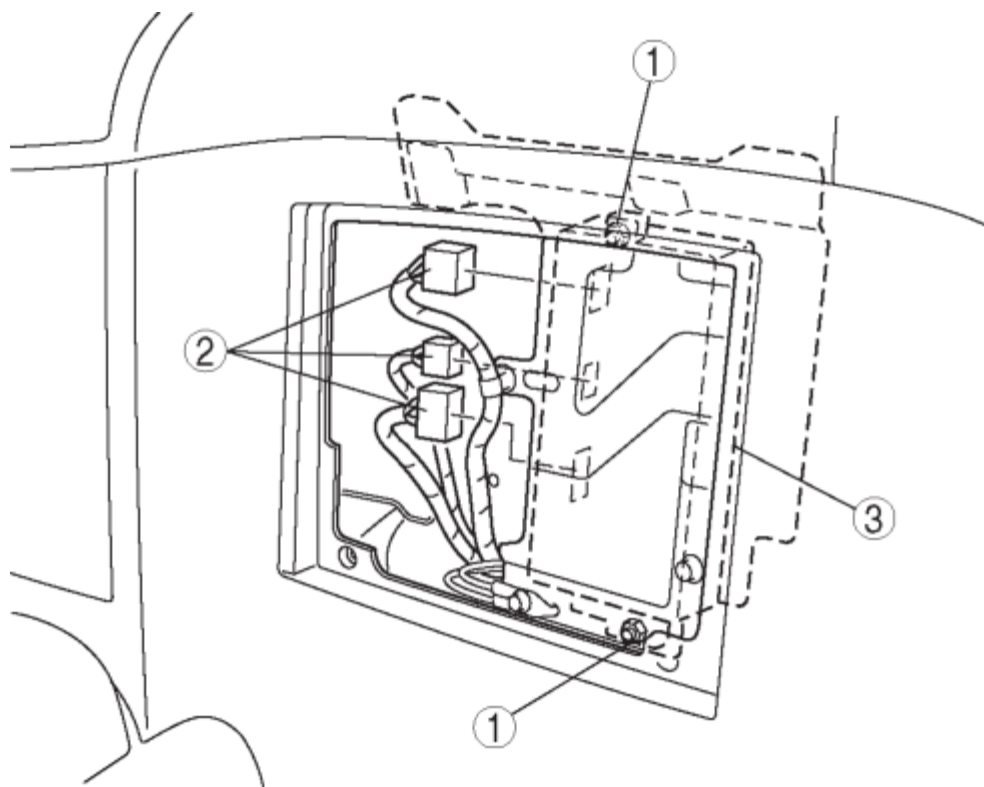
### POWER RETRACTABLE HARDTOP CONTROL MODULE REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the service hole cover (LH) of the back trim.
4. Partially peel back the power retractable hardtop cover.
5. Remove the roof hook cable case.



6. Remove in the order indicated in the table.





1	Nut
2	Connector
3	Power retractable hardtop control module

7. Install in the reverse order of removal.

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## 2008 - MX-5 - Body and Accessories

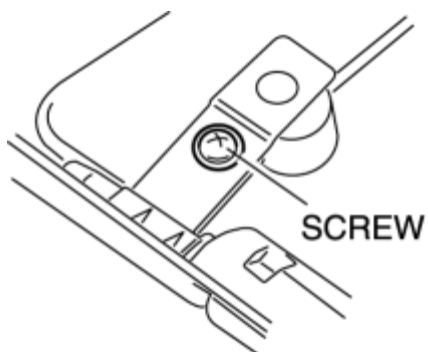
### SUNVISOR REMOVAL/INSTALLATION

#### Removal

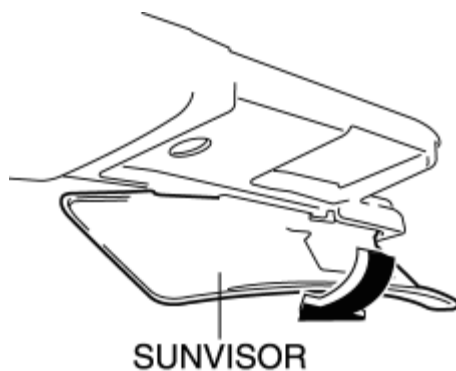
1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#))
3. Remove the following parts:
  - a. Female wedge (See [CONVERTIBLE TOP DISASSEMBLY/ASSEMBLY.](#))
  - b. A-pillar trim (See [A-PILLAR TRIM REMOVAL/INSTALLATION.](#))
  - c. Front header trim (See [FRONT HEADER TRIM REMOVAL/INSTALLATION.](#))

#### CAUTION:

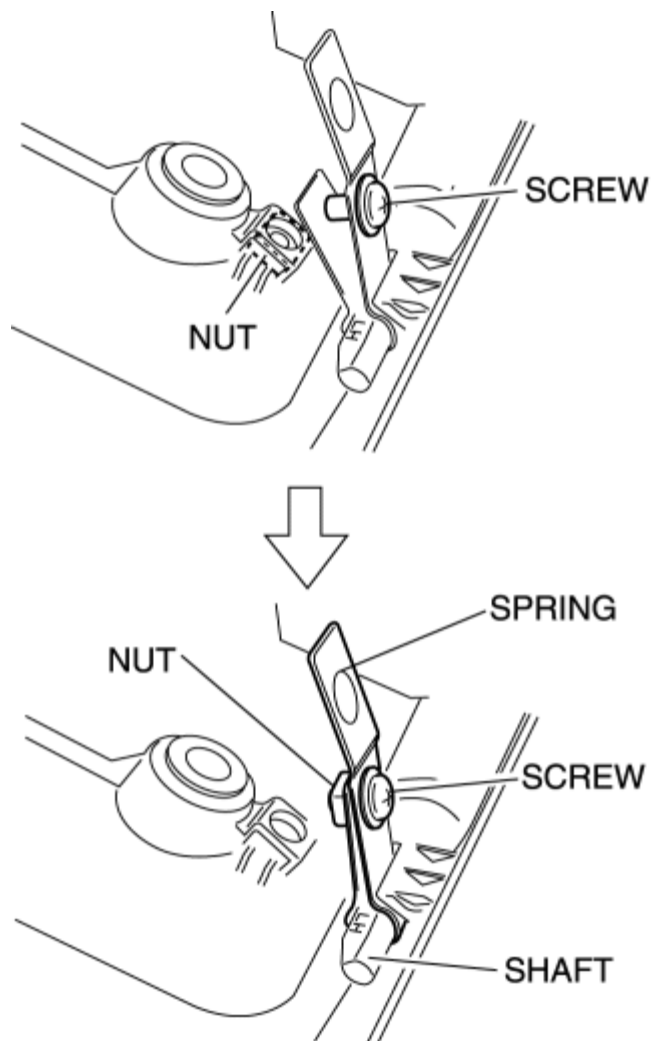
- Perform the procedure on a clean rag so as not to damage or soil the front header trim and sunvisor.
  - Do not twist or drop the sunvisor, otherwise the vanity mirror could be damaged.
4. Remove the screw.



5. Open the sunvisor in the direction of arrow shown in the figure.



6. Remove the nuts shown in the figure.

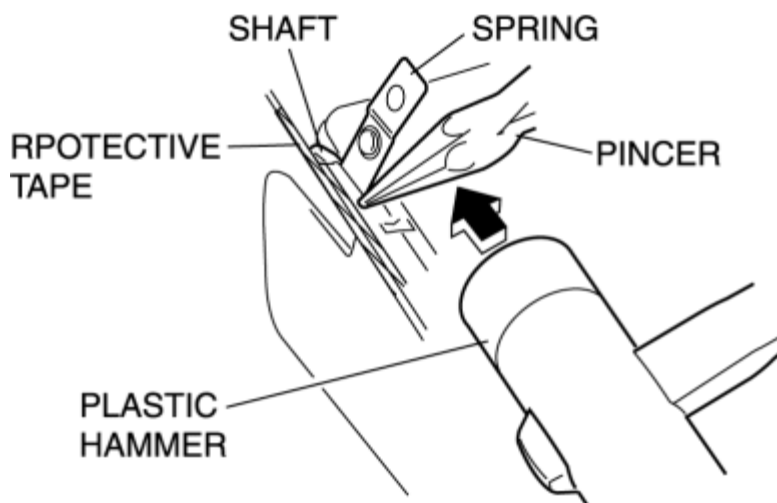


7. Install the screw and nut for the spring.

**CAUTION:**

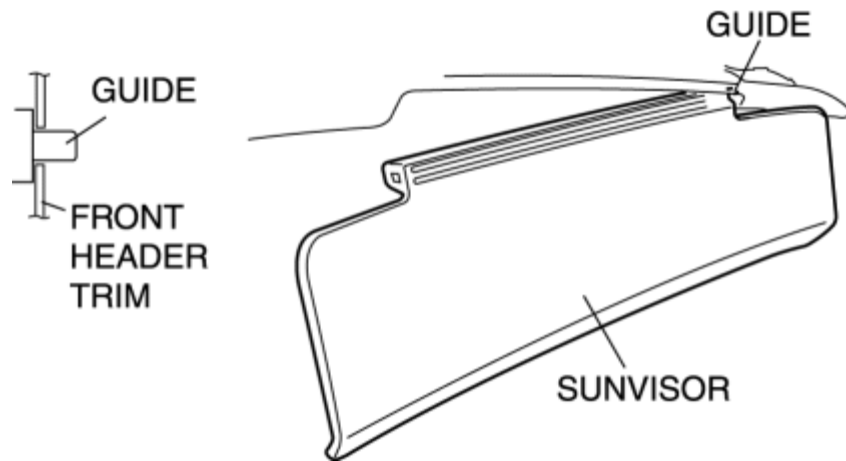
- To prevent looseness or excessive play, do not slide the spring in the direction of the long axis of the shaft.

8. Affix protective tape to the position shown in the figure for the front header trim.



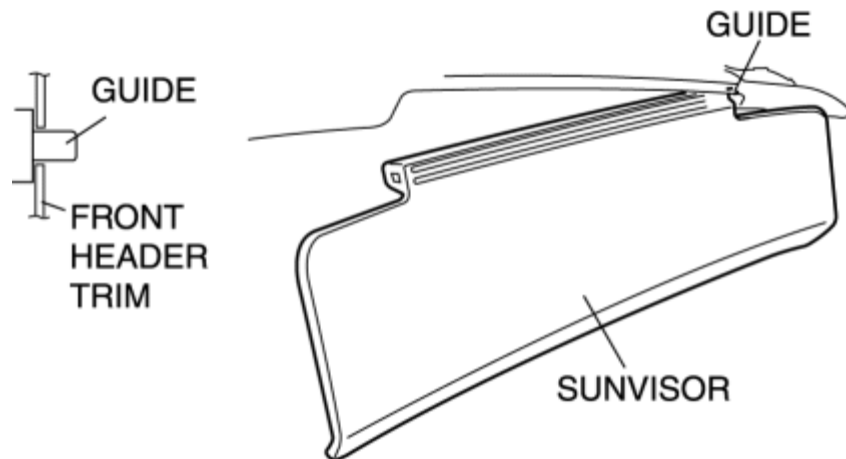
9. Grasp the sides of the spring with a pair of pincers, lightly tap a pair of pincers using a plastic hammer, and remove the shaft.

10. Detach the guide, then remove the sunvisor from the front header trim.

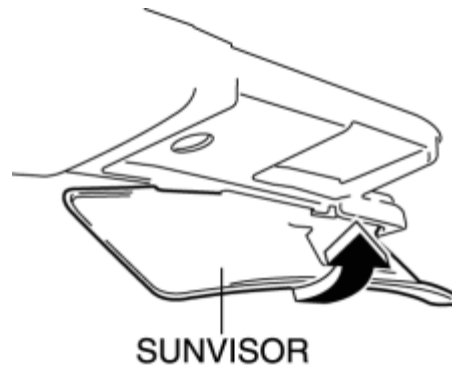


## Installation

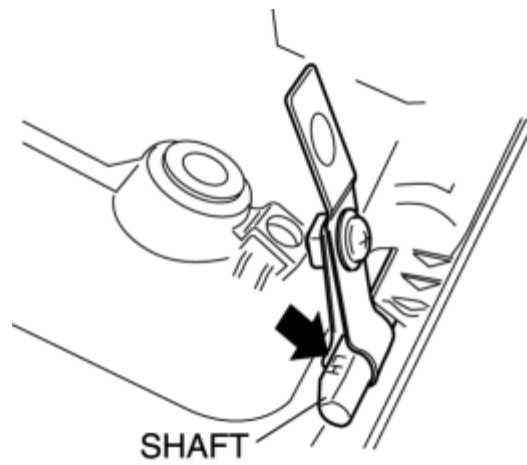
1. Install the guide while install the sunvisor for the front header trim.



2. Close the sunvisor in the direction of arrow shown in the figure.



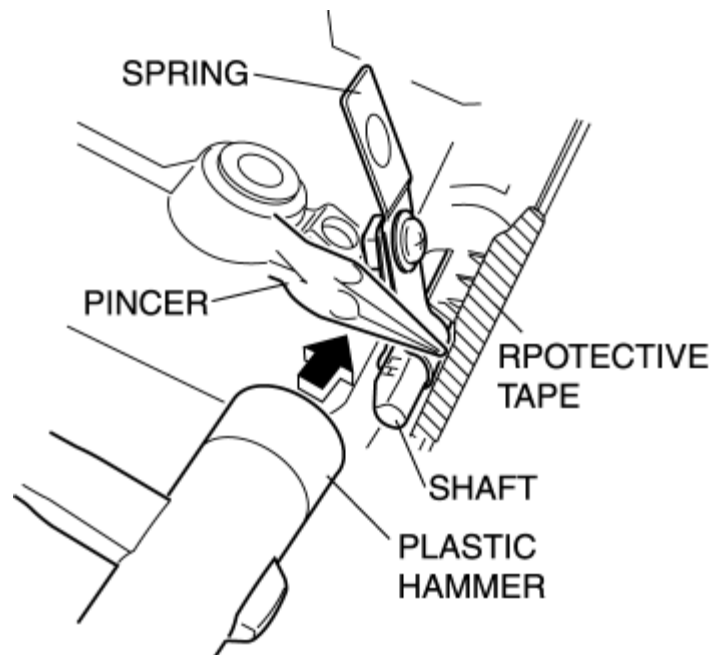
3. Set the shaft so that its mark faces outward.



**NOTE:**

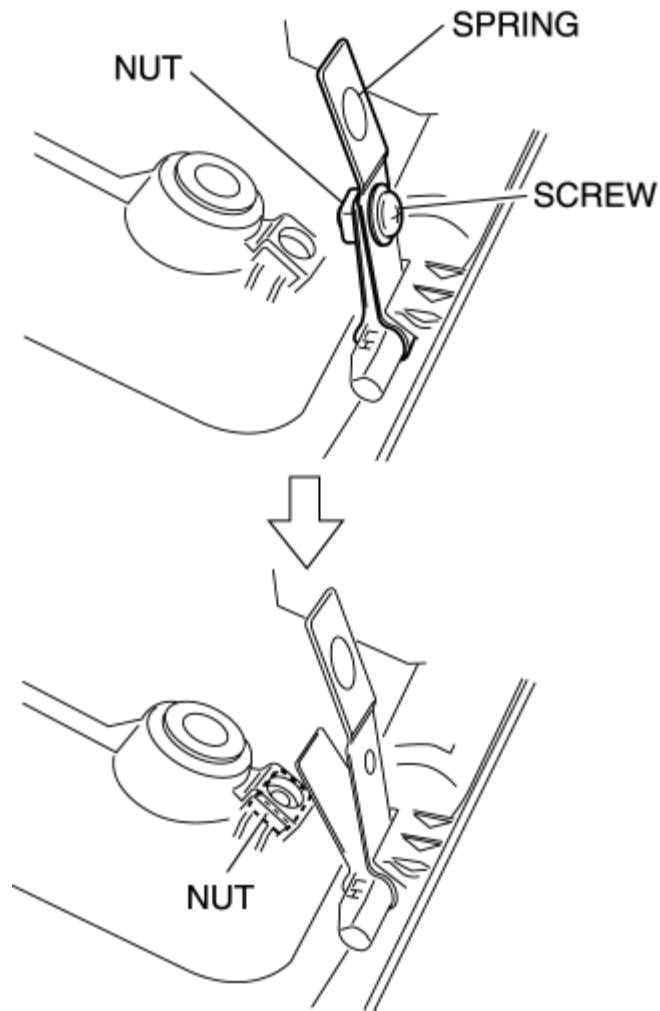
- When installing the shaft, verify the left or right side by its mark.

4. Affix protective tape to the position shown in the figure for the front header trim.



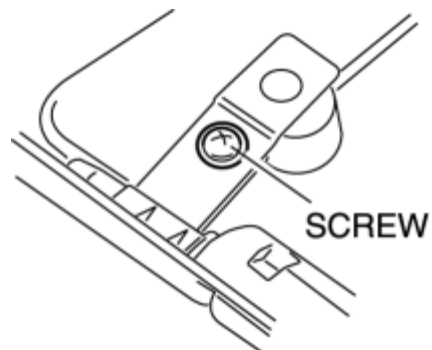
5. Grasp the sides of the spring with a pair of pincers, lightly tap a pair of pincers using a plastic hammer, and install the shaft.

6. Remove the screw and nut from the spring.



7. Install the nut shown in the figure.

8. Install the screw.



9. Install the following parts:

- a. Front header trim (See [FRONT HEADER TRIM REMOVAL/INSTALLATION.](#))
- b. A-pillar trim (See [A-PILLAR TRIM REMOVAL/INSTALLATION.](#))
- c. Female wedge (See [CONVERTIBLE TOP DISASSEMBLY/ASSEMBLY.](#))

10. Connect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#))

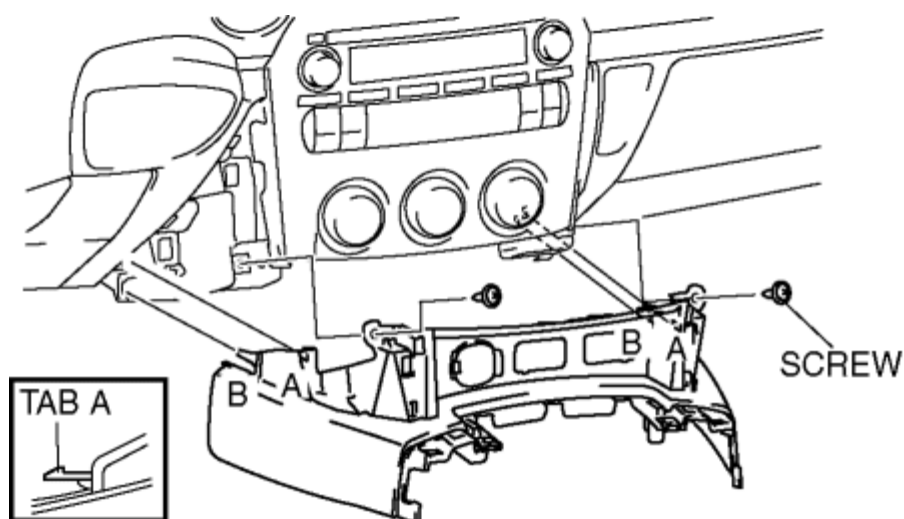
11. Install the battery cover.



## 2008 - MX-5 - Body and Accessories

### CONSOLE PANEL REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the console. (See [CONSOLE REMOVAL/INSTALLATION](#).)
4. Remove the side wall. (See [SIDE WALL REMOVAL/INSTALLATION](#).)
5. Remove the screws.

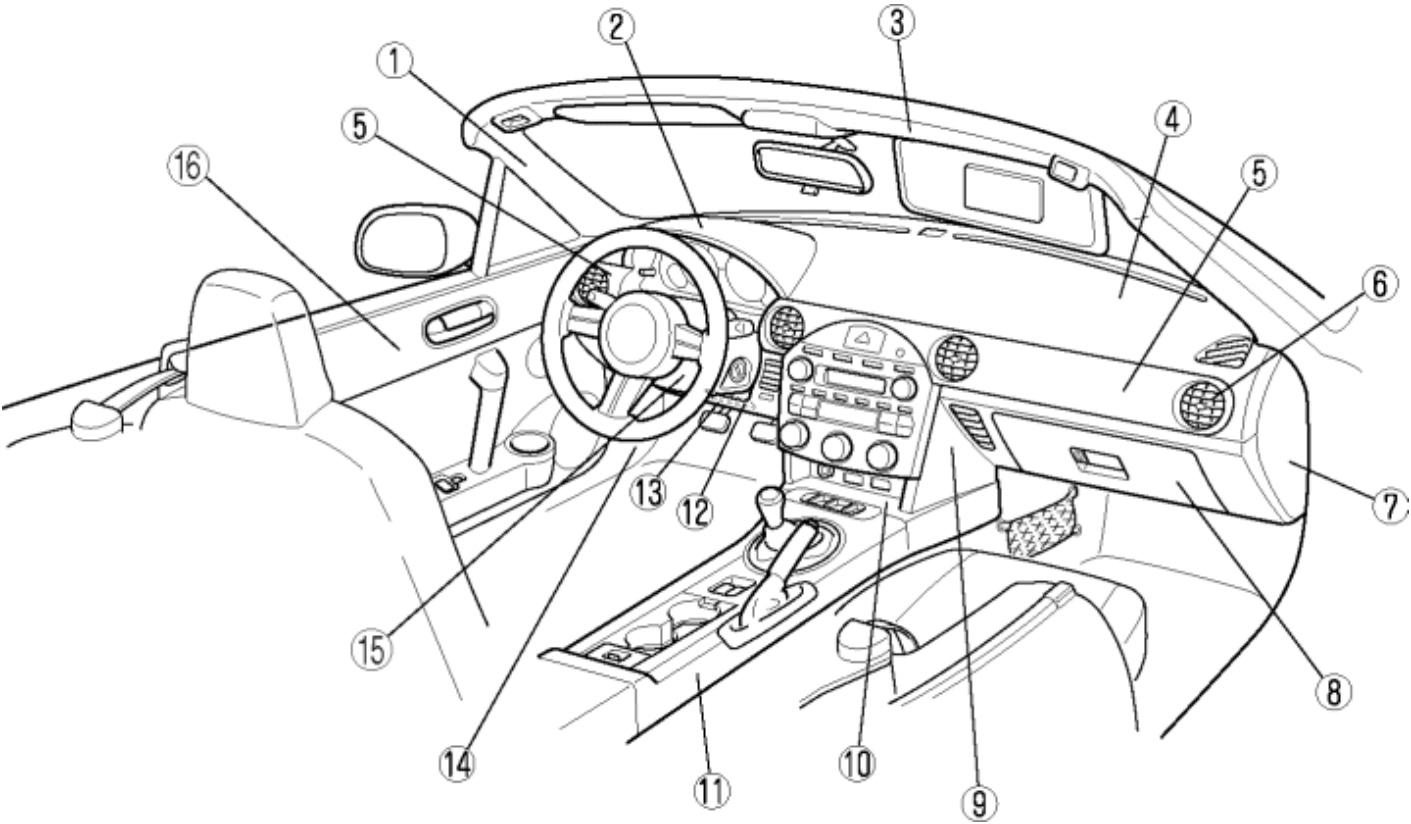


6. Pull the console panel outward and detach tabs A and pins B.
7. Disconnect the seat warmer switch connector. (Vehicles with seat warmer)
8. Disconnect the accessory socket connector.
9. Remove the console panel.
10. Install in the reverse order of removal.



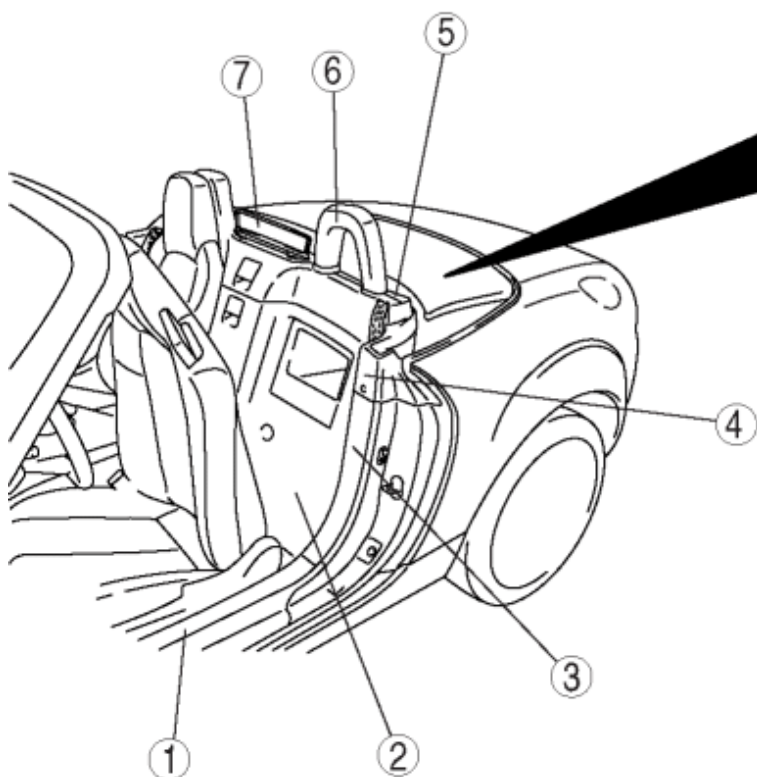
2008 - MX-5 - Body and Accessories

INTERIOR TRIM LOCATION INDEX



1	A-pillar trim (See <a href="#">A-PILLAR TRIM REMOVAL/INSTALLATION.</a> )
2	Meter hood (See <a href="#">METER HOOD REMOVAL/INSTALLATION.</a> )
3	Front header trim (See <a href="#">FRONT HEADER TRIM REMOVAL/INSTALLATION.</a> )
4	Dashboard (See <a href="#">DASHBOARD REMOVAL/INSTALLATION.</a> )
5	Decoration panel (See <a href="#">DECORATION PANEL REMOVAL/INSTALLATION.</a> )

6	Ventilator grille (See <a href="#">VENTILATOR GRILLE REMOVAL/INSTALLATION.</a> )
7	Side panel (See <a href="#">SIDE PANEL REMOVAL/INSTALLATION.</a> )
8	Glove compartment (See <a href="#">GLOVE COMPARTMENT REMOVAL/INSTALLATION.</a> )
9	Side wall (See <a href="#">SIDE WALL REMOVAL/INSTALLATION.</a> )
10	Console panel (See <a href="#">CONSOLE PANEL REMOVAL/INSTALLATION.</a> )
11	Console (See <a href="#">CONSOLE REMOVAL/INSTALLATION.</a> ) (See <a href="#">CONSOLE DISASSEMBLY/ASSEMBLY.</a> )
12	Knee bolster (See <a href="#">KNEE BOLSTER REMOVAL/INSTALLATION.</a> )
13	Lower panel (See <a href="#">LOWER PANEL REMOVAL/INSTALLATION.</a> )
14	Front side trim (See <a href="#">FRONT SIDE TRIM REMOVAL/INSTALLATION.</a> )
15	Column cover (See <a href="#">COLUMN COVER REMOVAL/INSTALLATION.</a> )
16	Door trim (See <a href="#">DOOR TRIM REMOVAL/INSTALLATION.</a> )



1 Scuff plate

(See [SCUFF PLATE REMOVAL/INSTALLATION.](#))

2 Back trim

(See [BACK TRIM REMOVAL/INSTALLATION.](#))

3 Tire house trim

(See [TIRE HOUSE TRIM REMOVAL/INSTALLATION.](#))

4 Quarter trim

(See [QUARTER TRIM REMOVAL/INSTALLATION.](#))

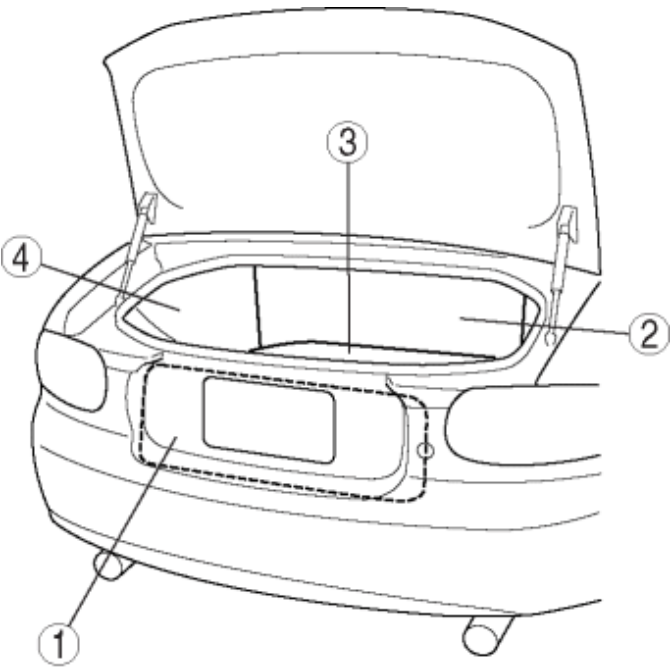
5 Seat back bar lower garnish

(See [SEAT BACK BAR LOWER GARNISH REMOVAL/INSTALLATION.](#))

6 Seat back bar garnish

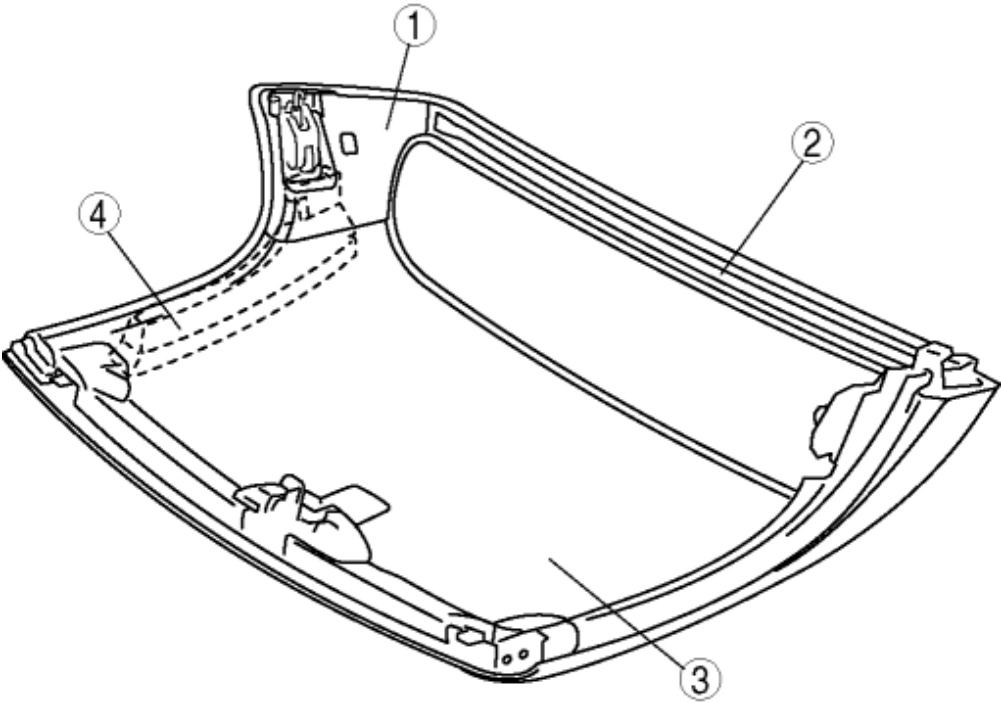
(See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION.](#))

7	Aeroboard (See <a href="#">AEROBOARD REMOVAL/INSTALLATION.</a> )
8	Rear package trim (See <a href="#">REAR PACKAGE TRIM REMOVAL/INSTALLATION.</a> )
9	Side shelf (See <a href="#">SIDE SHELF REMOVAL/INSTALLATION.</a> )
10	Rear side trim (See <a href="#">REAR SIDE TRIM REMOVAL/INSTALLATION.</a> )



1	Trunk end trim (See <a href="#">TRUNK END TRIM REMOVAL/INSTALLATION.</a> )
2	Partition board (See <a href="#">PARTITION BOARD REMOVAL/INSTALLATION.</a> )
3	Trunk mat (See <a href="#">TRUNK MAT REMOVAL/INSTALLATION.</a> )
4	Trunk side trim (See <a href="#">TRUNK SIDE TRIM REMOVAL/INSTALLATION.</a> )

Detachable Hardtop

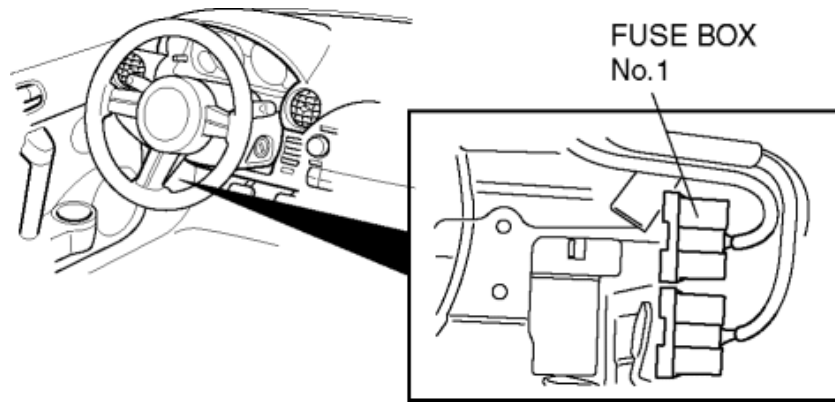


1	B-pillar upper trim (See <a href="#">B-PILLAR UPPER TRIM REMOVAL [DETACHABLE HARDTOP].</a> ) (See <a href="#">B-PILLAR UPPER TRIM INSTALLATION [DETACHABLE HARDTOP].</a> )
2	Rear trim (See <a href="#">REAR TRIM REMOVAL [DETACHABLE HARDTOP].</a> ) (See <a href="#">REAR TRIM INSTALLATION [DETACHABLE HARDTOP].</a> )
3	Headliner (See <a href="#">HEADLINER REMOVAL/INSTALLATION [DETACHABLE HARDTOP].</a> )
4	Shock-absorbing pad (See <a href="#">SHOCK ABSORBING PAD REMOVAL/INSTALLATION [DETACHABLE HARDTOP].</a> )

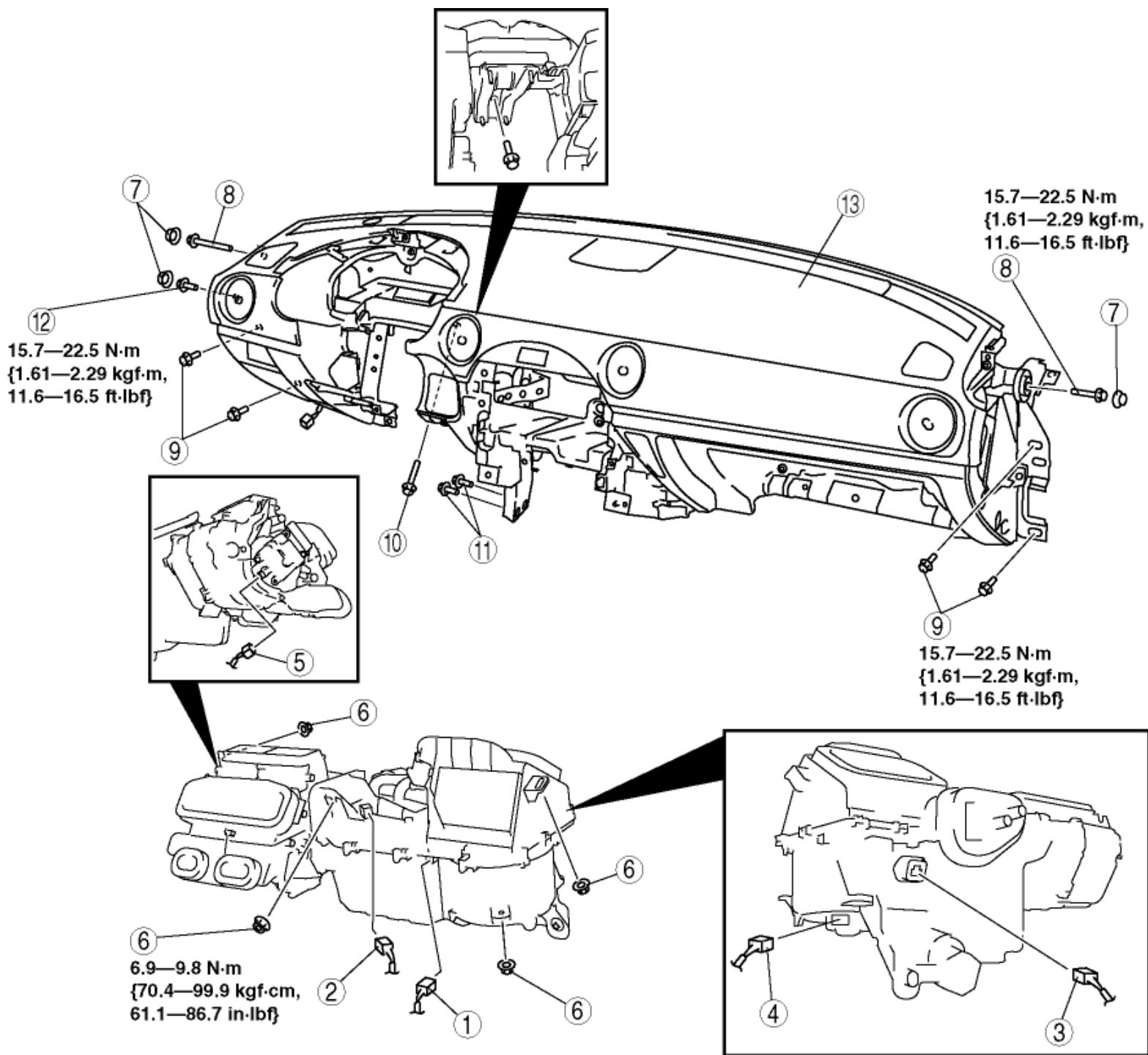
## 2008 - MX-5 - Body and Accessories

### DASHBOARD REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the following parts:
  - a. Console (See [CONSOLE REMOVAL/INSTALLATION](#).)
  - b. Glove compartment (See [GLOVE COMPARTMENT REMOVAL/INSTALLATION](#).)
  - c. Side wall (See [SIDE WALL REMOVAL/INSTALLATION](#).)
  - d. Console panel (See [CONSOLE PANEL REMOVAL/INSTALLATION](#).)
  - e. Center panel unit (See [CENTER PANEL UNIT REMOVAL/INSTALLATION](#).)
  - f. Lower panel (See [LOWER PANEL REMOVAL/INSTALLATION](#).)
  - g. Knee bolster (See [KNEE BOLSTER REMOVAL/INSTALLATION](#).)
  - h. Column cover (See [COLUMN COVER REMOVAL/INSTALLATION](#).)
  - i. Driver-side air bag module (See [DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION](#).)
  - j. Steering wheel (See [STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION](#).)
  - k. Combination switch (See [COMBINATION SWITCH REMOVAL/INSTALLATION](#).)
  - l. Steering shaft (See [STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION](#).)
  - m. Meter hood (See [METER HOOD REMOVAL/INSTALLATION](#).)
  - n. Instrument cluster (See [INSTRUMENT CLUSTER REMOVAL/INSTALLATION](#).)
  - o. Side panel (See [SIDE PANEL REMOVAL/INSTALLATION](#).)
  - p. Hood release lever (See [HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION \[ADVANCED KEYLESS SYSTEM\]](#).)
  - q. Female wedge (See [CONVERTIBLE TOP DISASSEMBLY/ASSEMBLY](#).)
  - r. A-pillar trim (See [A-PILLAR TRIM REMOVAL/INSTALLATION](#).)
  - s. Scuff plate (See [SCUFF PLATE REMOVAL/INSTALLATION](#).)
  - t. Front side trim (See [FRONT SIDE TRIM REMOVAL/INSTALLATION](#).)
  - u. Fuse box No.1



4. Disconnect the dashboard harness connectors.
5. Remove in the order indicated in the figure.
6. Install in the reverse order of removal.



- |   |   |
|---|---|
| 1 | Evaporator temperature sensor connector |
| 2 | Short code connector                    |
| 3 | Power MOS FET connector                 |
| 4 | Blower motor connector                  |
| 5 | Airflow mode actuator connector         |

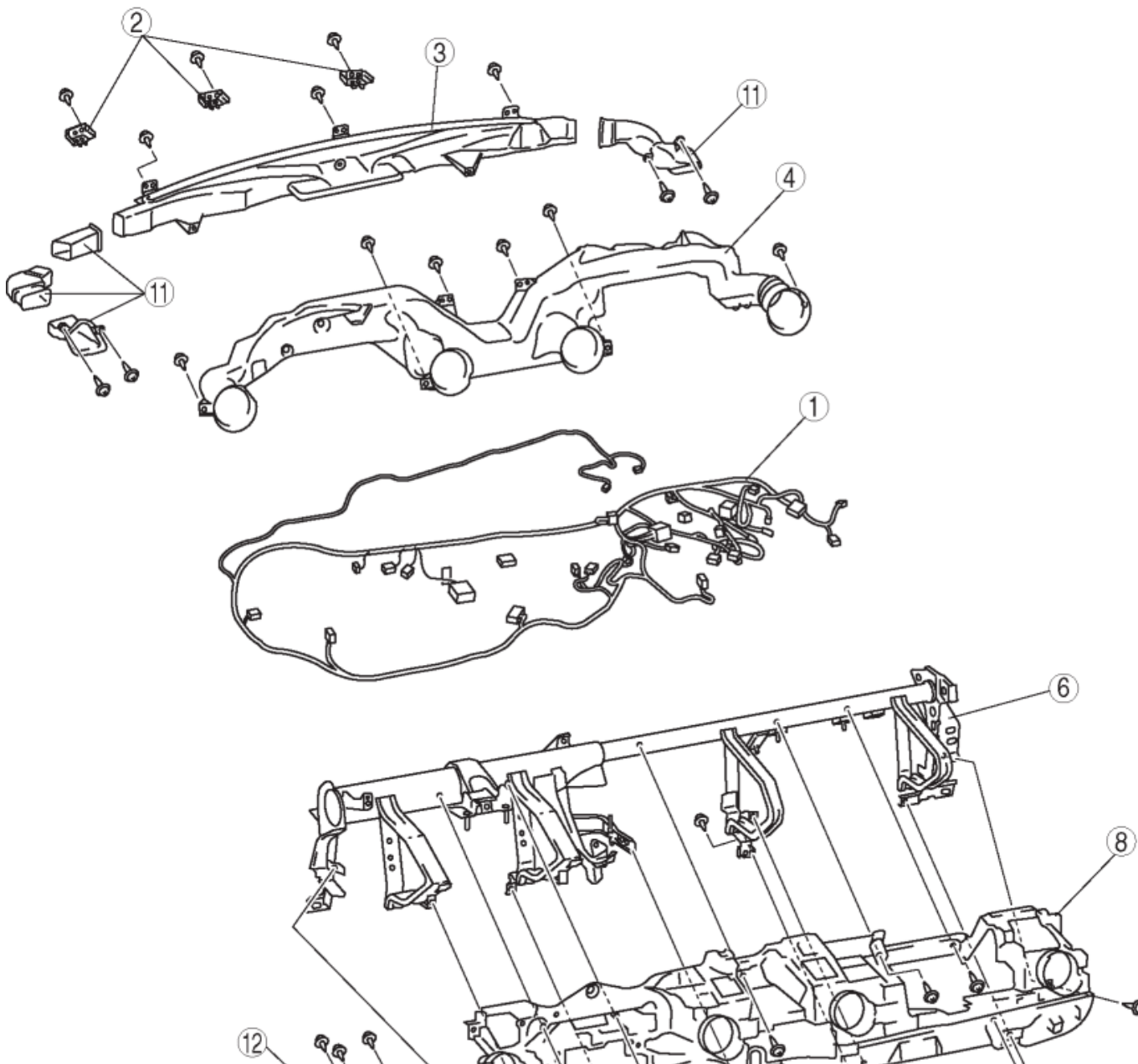


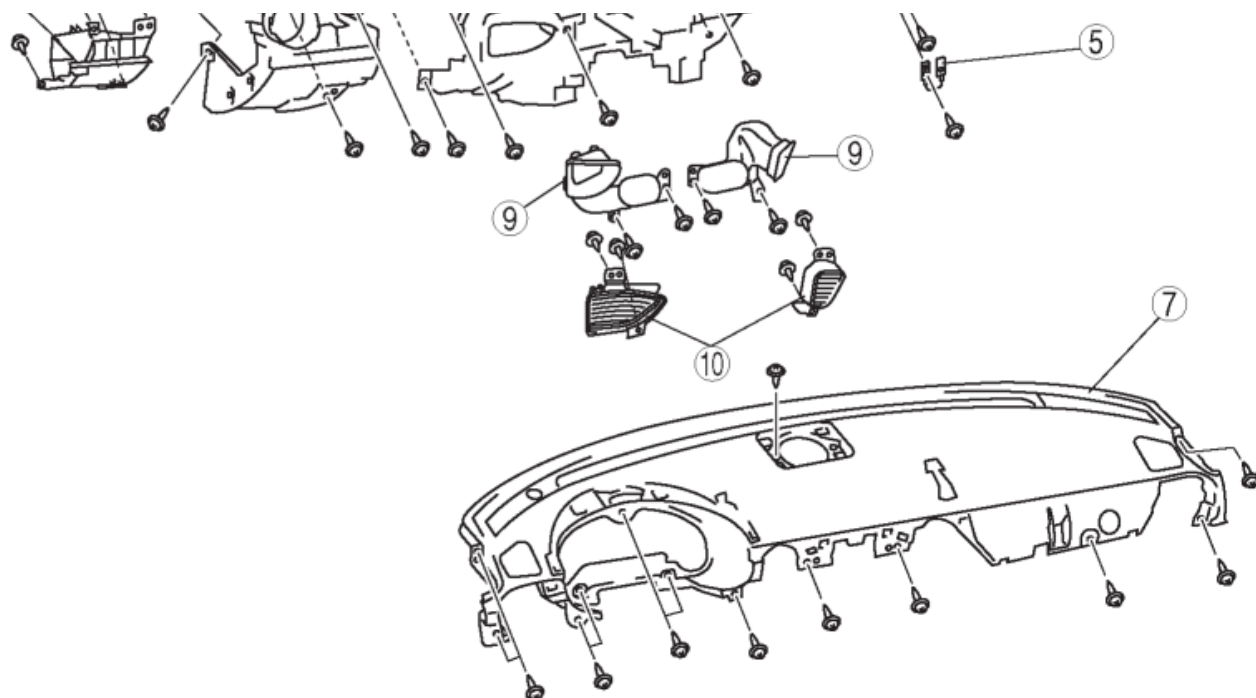
6	Nut
7	Cover
8	Bolt A
9	Bolt B
10	Bolt C
11	Bolt D
12	Bolt E
13	Dashboard

## 2008 - MX-5 - Body and Accessories

### DASHBOARD DISASSEMBLY/ASSEMBLY

1. Remove the following parts:
  - a. Decoration panel (See [DECORATION PANEL REMOVAL/INSTALLATION.](#))
  - b. Hazard warning switch (See [HAZARD WARNING SWITCH REMOVAL/INSTALLATION.](#))
  - c. Center speaker cover (See [CENTER SPEAKER REMOVAL/INSTALLATION.](#))
  - d. Center speaker (vehicles with Bose®) (See [CENTER SPEAKER REMOVAL/INSTALLATION.](#))
  - e. Passenger-side air bag module (See [PASSENGER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.](#))
2. Disassemble in the order indicated in the table.
3. Assemble in the reverse order of disassembly.





1	Dashboard wiring harness
2	Pin
3	Defroster duct
4	Center duct
5	Striker
6	Dashboard member
7	Dashboard panel
8	Dashboard lower panel
9	Shower duct
10	Lower ventilator grille
11	Side demister nozzle
12	Switch panel

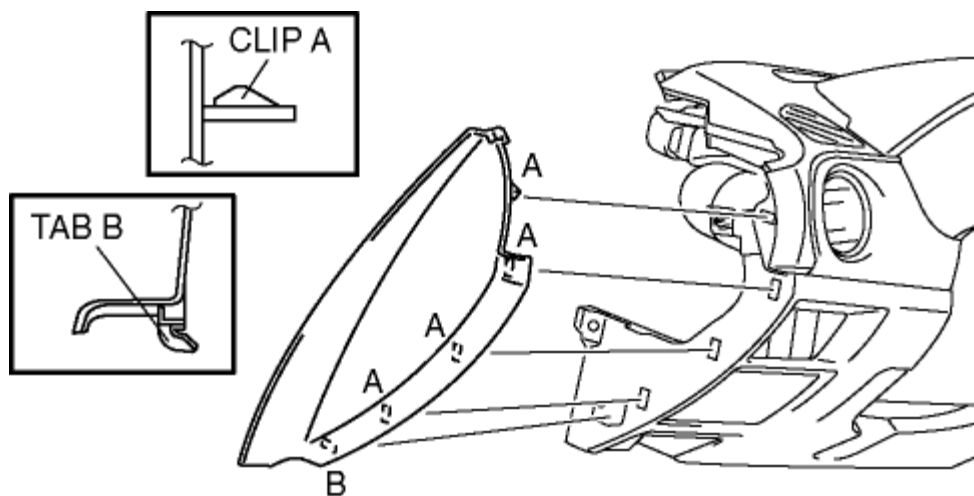
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## 2008 - MX-5 - Body and Accessories

### SIDE PANEL REMOVAL/INSTALLATION

1. Pull the side panel outward and detach clips A.

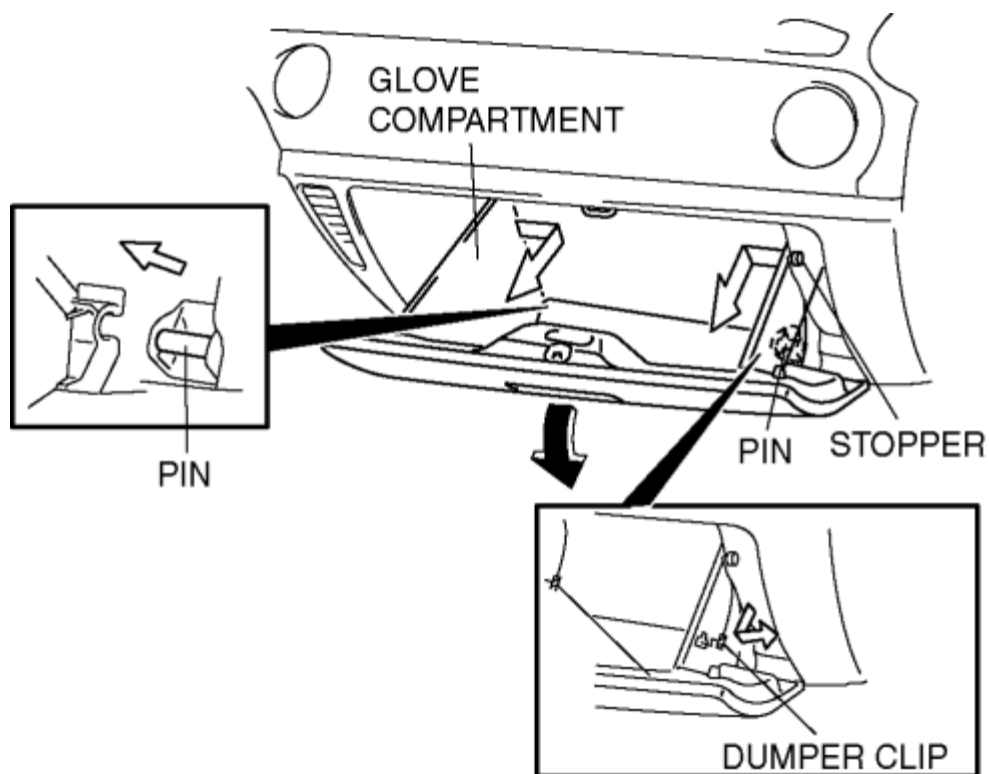


2. Pull the side panel rearward and detach tab B from the dashboard.
3. Remove the side panel.
4. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### GLOVE COMPARTMENT REMOVAL/INSTALLATION

1. Remove the dumper clip.

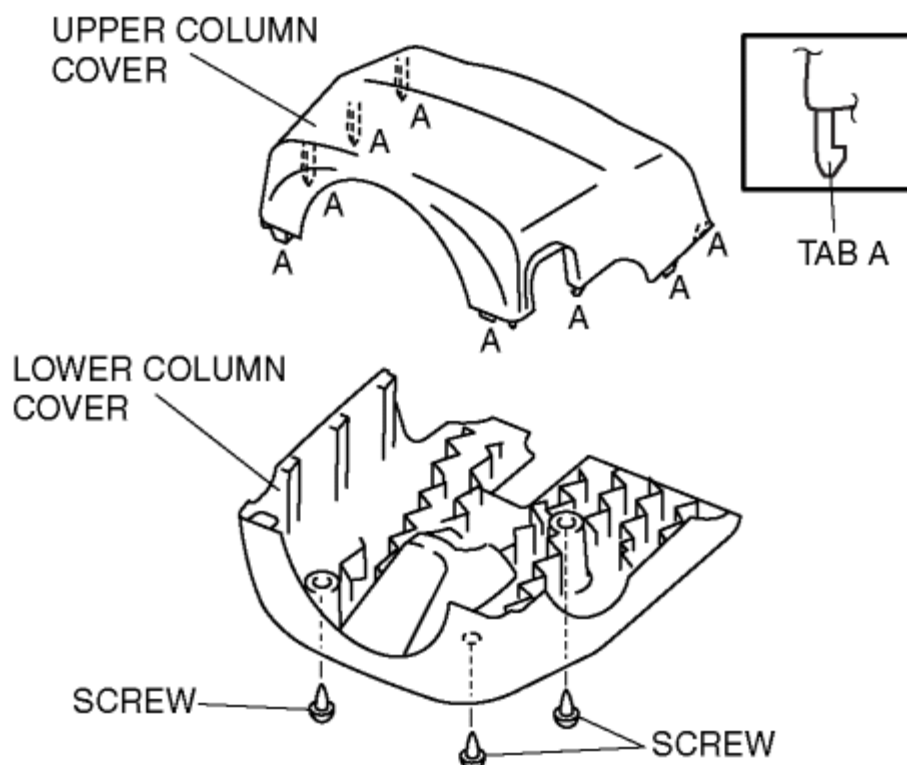


2. Bend the stoppers inward, then remove.
3. Turn the glove compartment downward and pull the pins.
4. Remove the glove compartment.
5. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### COLUMN COVER REMOVAL/INSTALLATION

1. Remove the tab A, then remove the upper column cover.

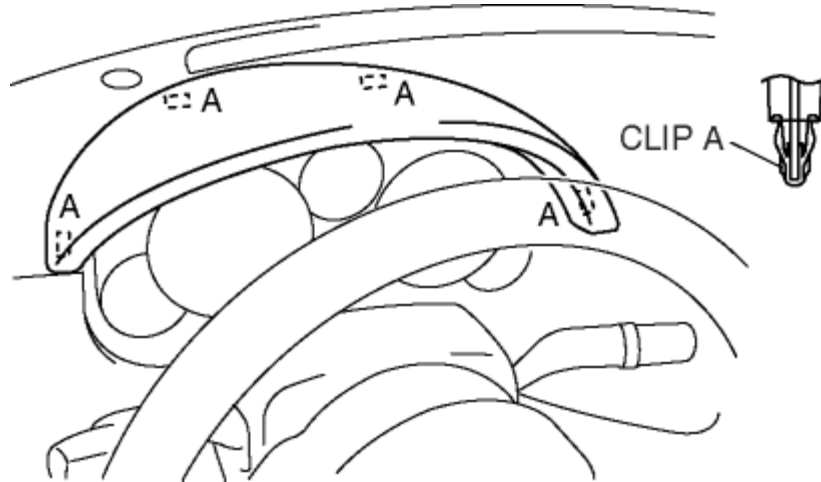


2. Remove the screws, then remove the lower column cover.
3. Remove the ignition key illumination. (See [IGNITION KEY ILLUMINATION BULB REMOVAL/INSTALLATION](#).)
4. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### METER HOOD REMOVAL/INSTALLATION

1. Pull the meter hood upward and detach clips A.

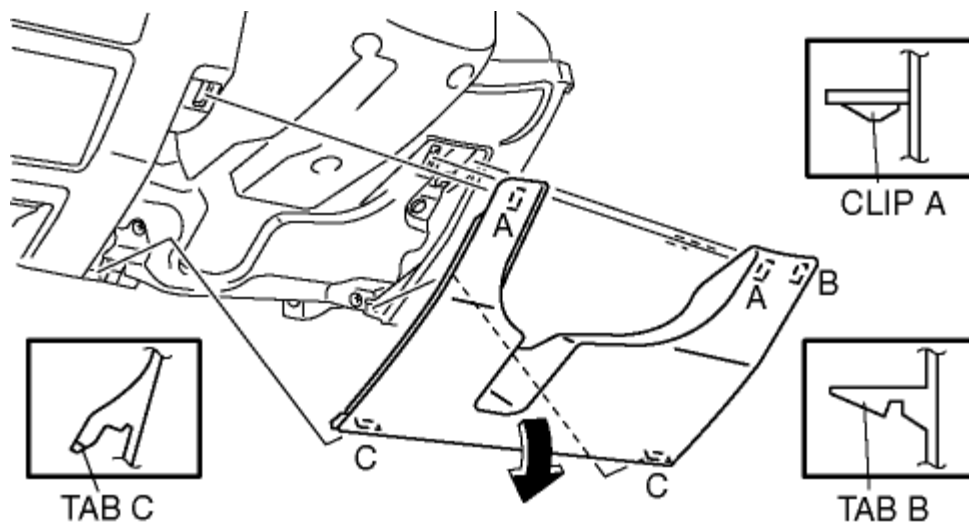


2. Remove the meter hood.
3. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### LOWER PANEL REMOVAL/INSTALLATION

1. Pull the lower panel outward and detach clips A and tab B.



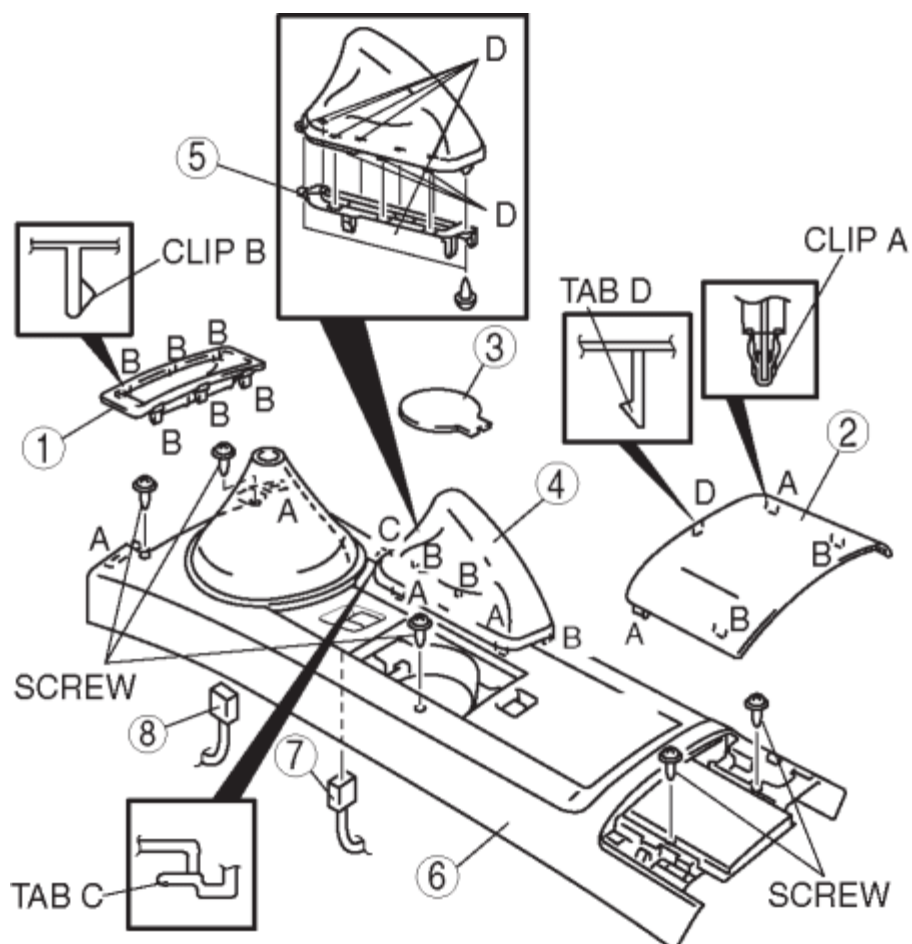
2. Turn the lower panel downward and remove the tabs C.
3. Remove the lower panel.
4. Install in the reverse order of removal.



## 2008 - MX-5 - Body and Accessories

### CONSOLE REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the selector lever knob (AT), shift lever knob (MT).
4. Remove in the order indicated in the table.



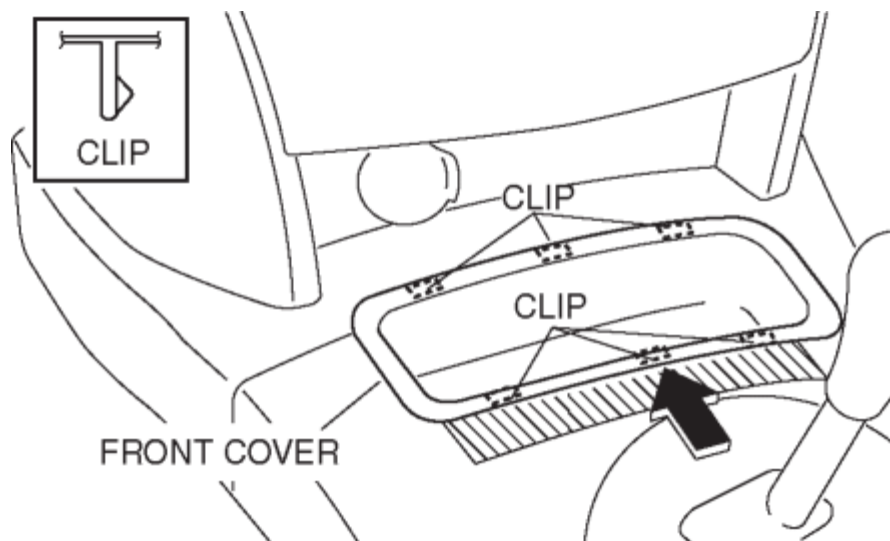
1	Front cover(see <a href="#">Front Cover Removal Note</a> )
2	Rear cover
3	Hole cover
4	Parking brake lever boot

5	Parking brake lever boot plate
6	Console
7	Power window main switch connector
8	Indicator compartment connector (AT)

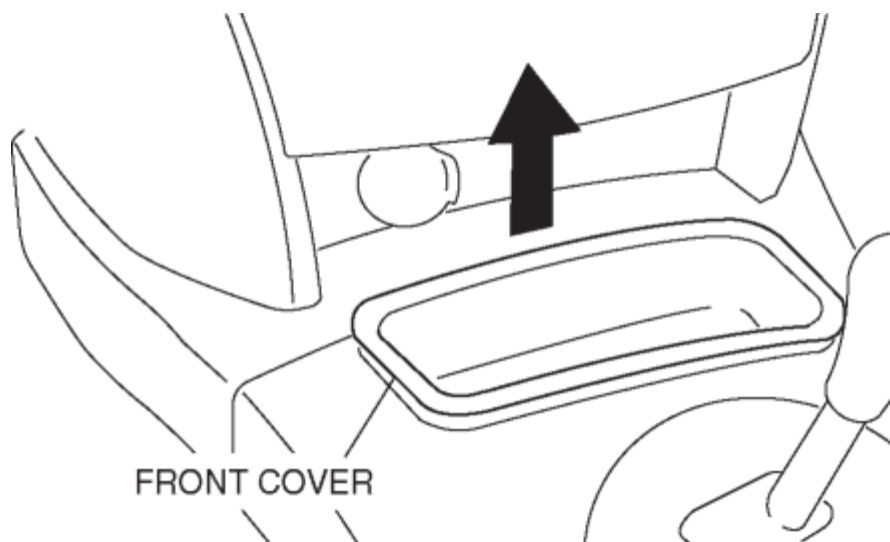
5. Install in the reverse order of removal.

### Front Cover Removal Note

1. Adhere protective tape in the shaded area shown in the figure and remove the clips using a fastener remover inserted in the position indicated by the arrow.



2. Remove the front cover in the direction shown in the figure.

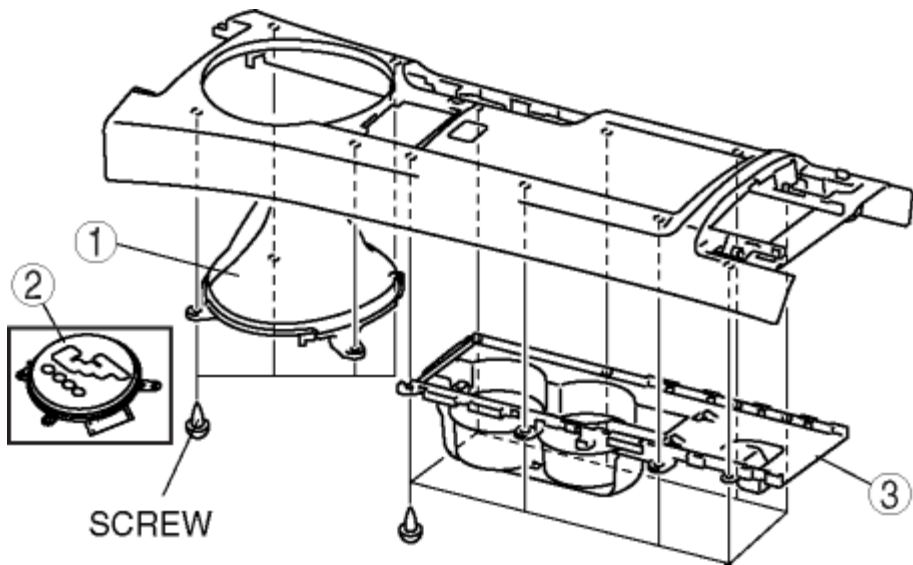




2008 - MX-5 - Body and Accessories

CONSOLE DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.



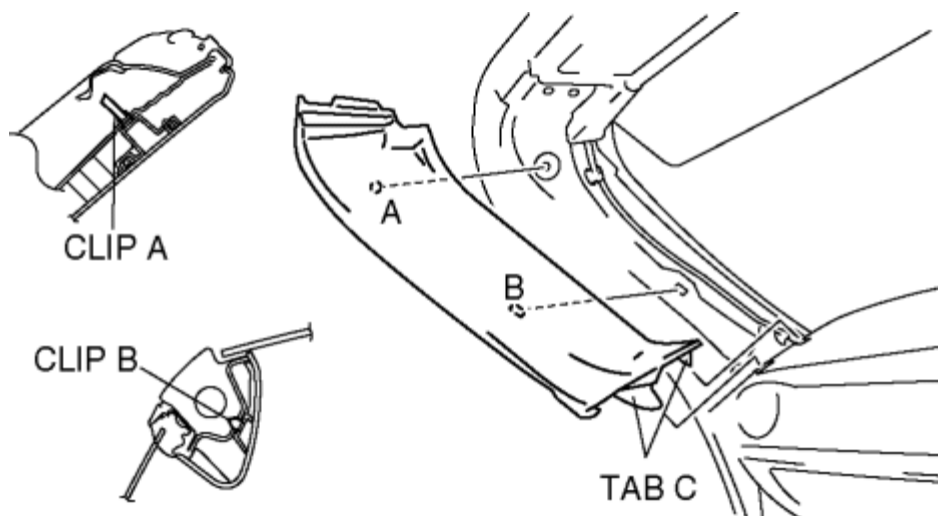
1	Boot (MT)
2	Indicator compartment (AT)
3	Cop holder

2. Assemble in the reverse order of disassembly.

## 2008 - MX-5 - Body and Accessories

### A-PILLAR TRIM REMOVAL/INSTALLATION

1. Remove the female wedge. (See [CONVERTIBLE TOP DISASSEMBLY/ASSEMBLY.](#))
2. Pull the A-pillar trim, then disengage clips A and B.

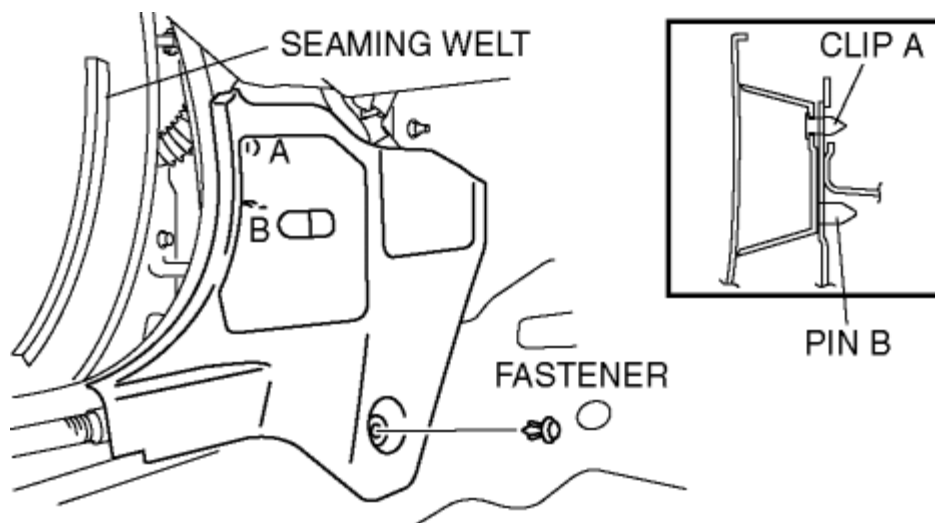


3. Pull the A pillar trim upward, then disengage tabs C from the body.
4. Remove the A-pillar trim.
5. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### FRONT SIDE TRIM REMOVAL/INSTALLATION

1. Remove the scuff plate. (See [SCUFF PLATE REMOVAL/INSTALLATION](#).)
2. Remove the seaming welt.

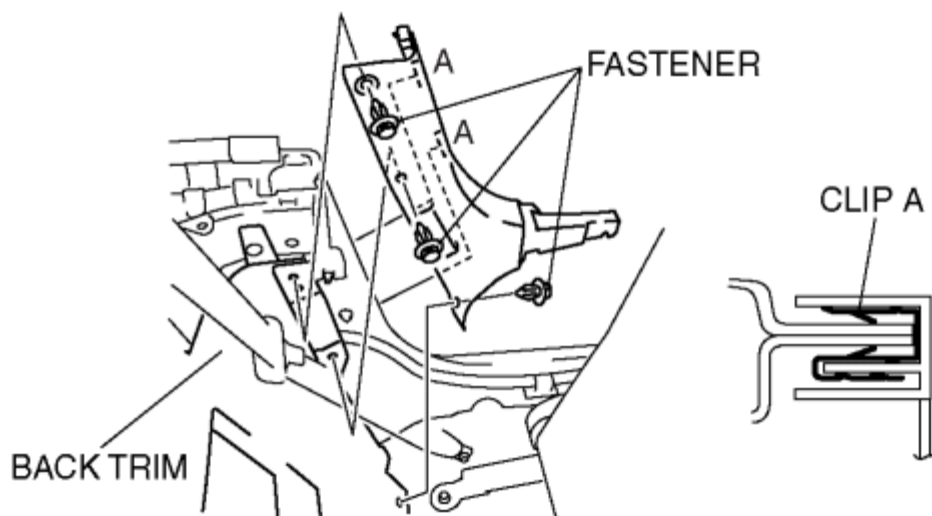


3. Remove the fastener.
4. Pull the front side trim toward you, then disengage clip A and pin B from the body.
5. Remove the front side trim.
6. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### TIRE HOUSE TRIM REMOVAL/INSTALLATION

1. Remove the quarter trim. (See [QUARTER TRIM REMOVAL/INSTALLATION.](#))
2. Remove the scuff plate. (See [SCUFF PLATE REMOVAL/INSTALLATION.](#))
3. Remove the fasteners.



4. Pull the tire house trim outward and detach clips A.
5. Remove the tire house trim.
6. Install in the reverse order of removal.

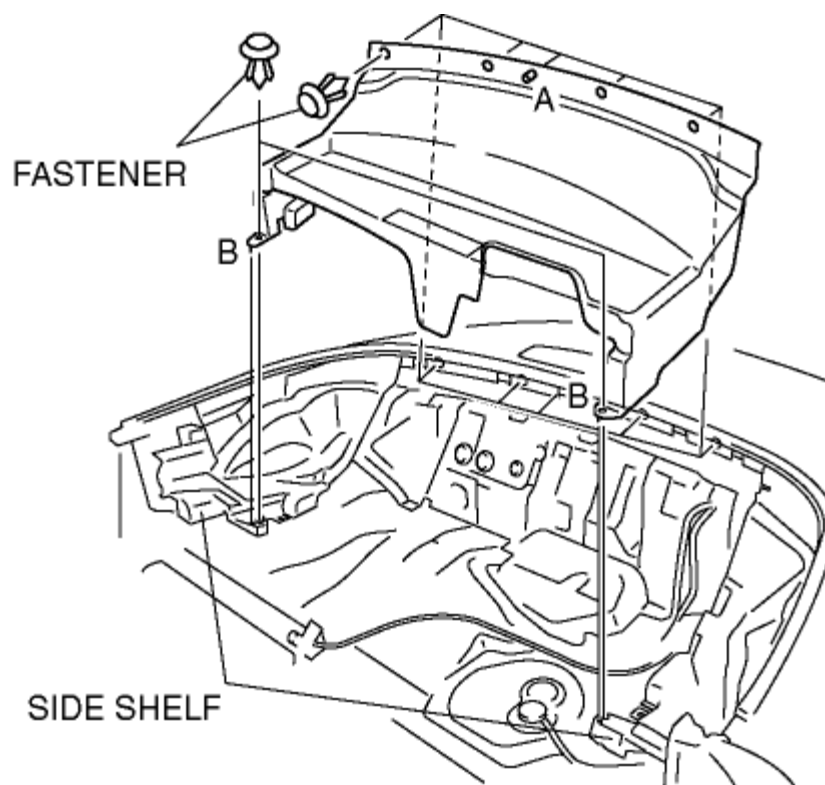
## 2008 - MX-5 - Body and Accessories

### REAR PACKAGE TRIM REMOVAL/INSTALLATION

1. Remove the following parts:

- a. Console (See [CONSOLE REMOVAL/INSTALLATION.](#))
- b. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION.](#))
- c. Scuff plate (See [SCUFF PLATE REMOVAL/INSTALLATION.](#))
- d. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION.](#))
- e. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION.](#))
- f. Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION.](#))
- g. Back trim (See [BACK TRIM REMOVAL/INSTALLATION.](#))
- h. Seat belt set plate (See [SEAT BELT REMOVAL/INSTALLATION.](#))
- i. Seat back crossmember assembly (See [SEAT BACK CROSSMEMBER ASSEMBLY REMOVAL/INSTALLATION.](#))
- j. Rear side trim (See [REAR SIDE TRIM REMOVAL/INSTALLATION.](#))

2. Remove the fasteners.





3. Remove the pins A and B.
4. Remove the rear package trim.
5. Install in the reverse order of removal.

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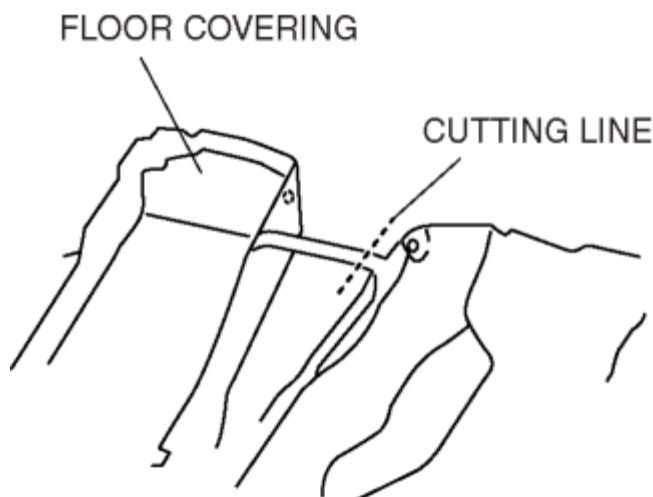
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## 2008 - MX-5 - Body and Accessories

### FLOOR COVERING REMOVAL/INSTALLATION

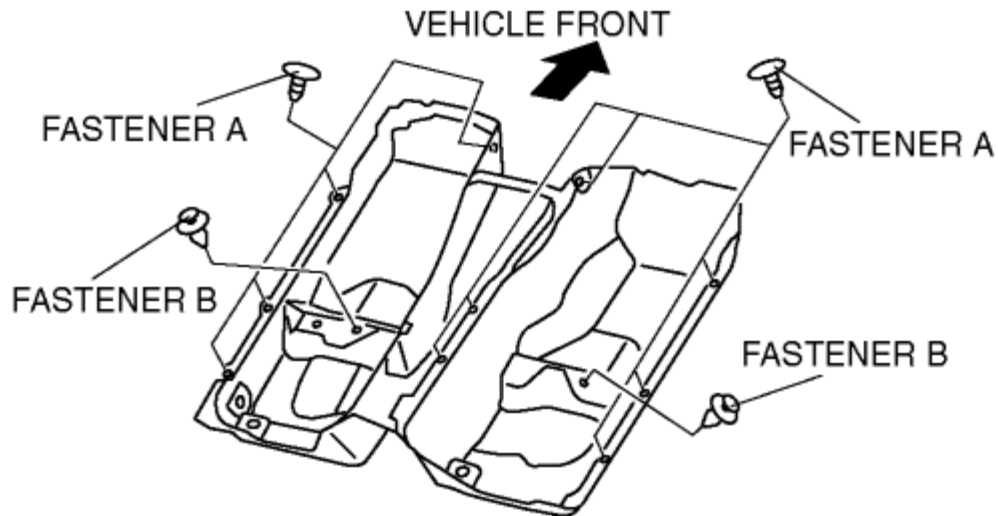
1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the following parts:
  - a. Seat (See [SEAT REMOVAL/INSTALLATION](#).)
  - b. Console (See [CONSOLE REMOVAL/INSTALLATION](#).)
  - c. Side wall (See [SIDE WALL REMOVAL/INSTALLATION](#).)
  - d. Console panel (See [CONSOLE PANEL REMOVAL/INSTALLATION](#).)
  - e. Foot rest
  - f. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION](#).)
  - g. Scuff plate ([SCUFF PLATE REMOVAL/INSTALLATION](#).)
  - h. Front side trim (See [FRONT SIDE TRIM REMOVAL/INSTALLATION](#).)
  - i. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION](#).)
  - j. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION](#).)
  - k. Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION](#).)
  - l. Back trim (See [BACK TRIM REMOVAL/INSTALLATION](#).)
4. Cut away the floor covering as shown in the figure.



#### NOTE:

- The cut part needs to match up when installing the floor covering.

5. Remove the fasteners.



6. Remove the floor covering.

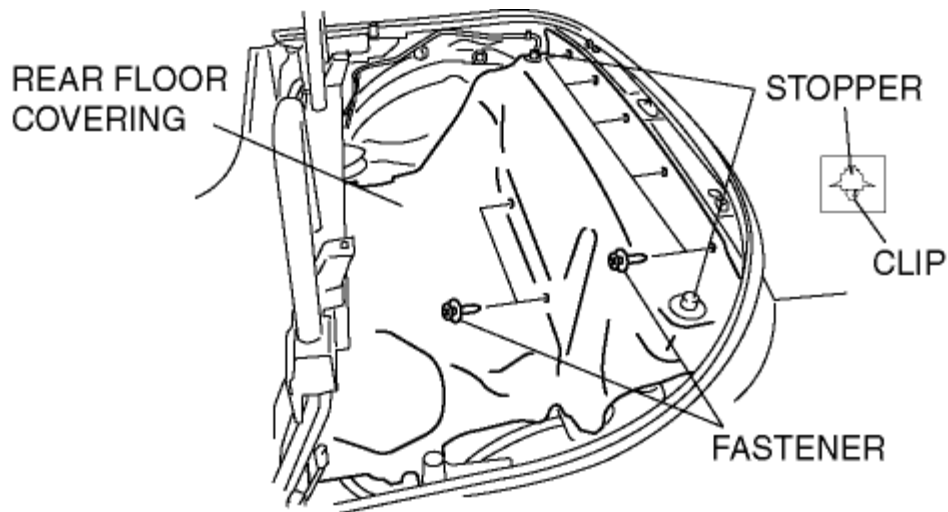
7. Install in the reverse order of removal.

### Rear Floor covering (Power Retractable Hardtop)

1. Fully open the deck panel.

2. Remove the side shelf. (See [SIDE SHELF REMOVAL/INSTALLATION.](#))

3. Remove the stoppers.



4. Remove the fasteners.

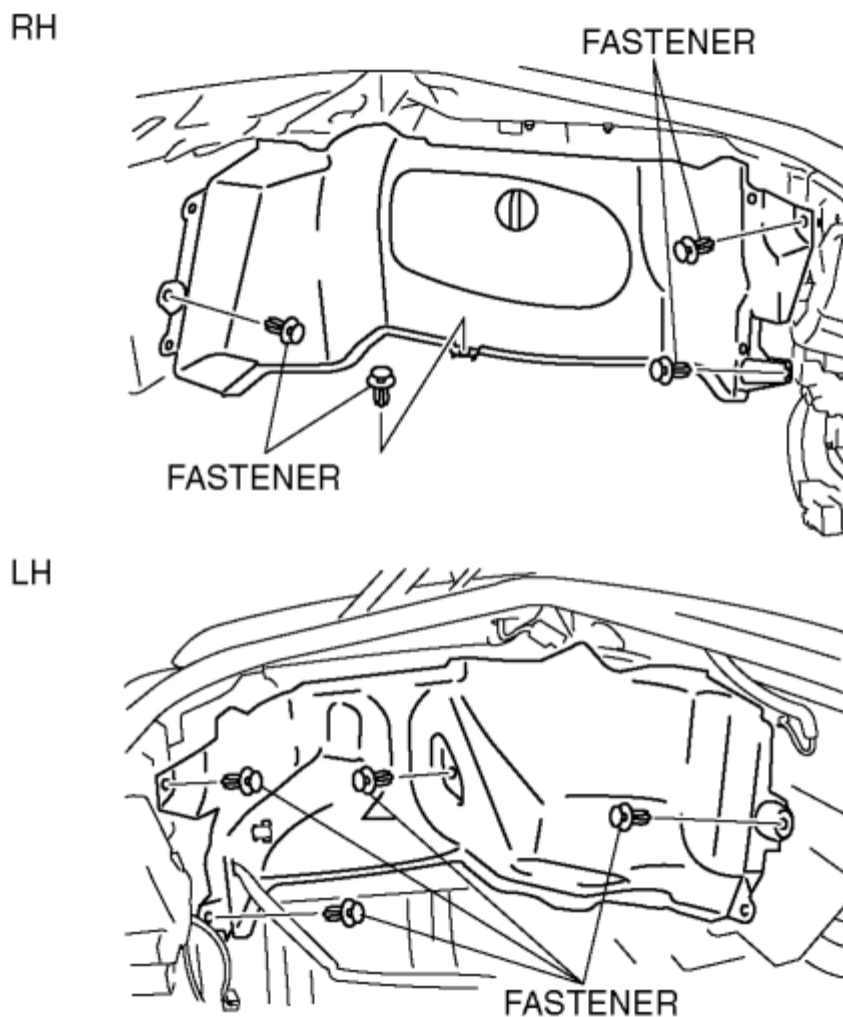
5. Remove the rear floor covering.

6. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### TRUNK SIDE TRIM REMOVAL/INSTALLATION

1. Remove the trunk end trim. (See [TRUNK END TRIM REMOVAL/INSTALLATION.](#))
2. Remove the partition board. (See [PARTITION BOARD REMOVAL/INSTALLATION.](#))
3. Remove the fasteners.

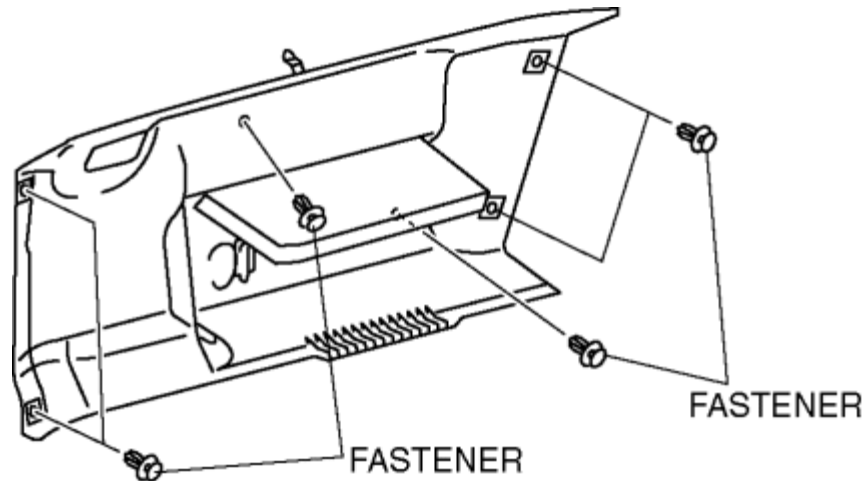


4. Remove the trunk side trim.
5. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### PARTITION BOARD REMOVAL/INSTALLATION

1. Remove the fasteners.

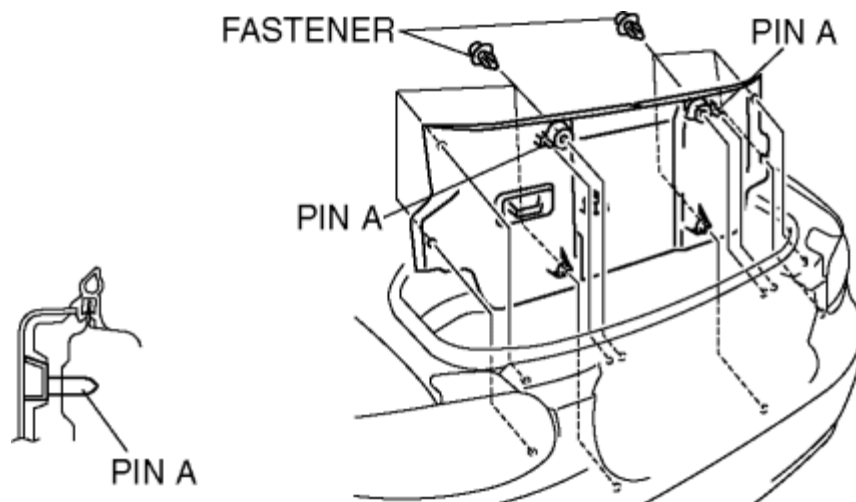


2. Remove the partition board.
3. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### TRUNK END TRIM REMOVAL/INSTALLATION

1. Remove the fasteners.

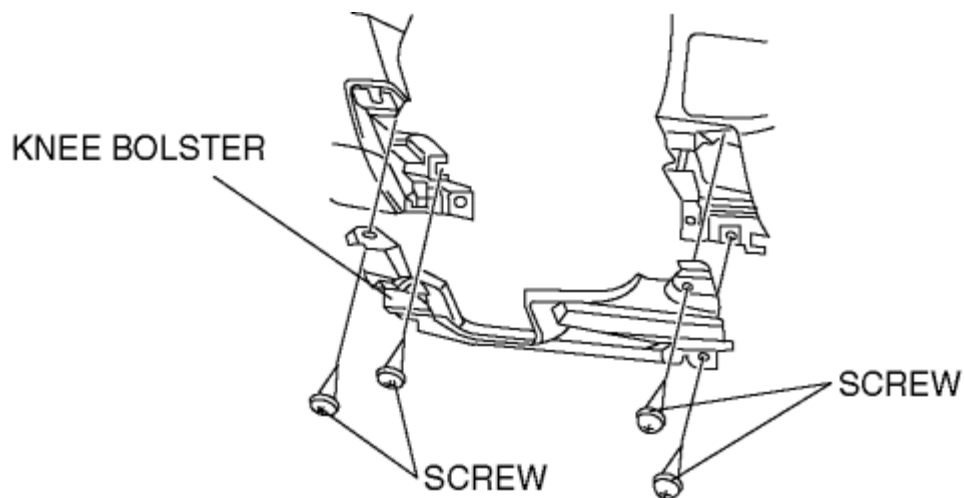


2. Disconnect the trunk compartment light connector.
3. Disconnect the trunk lid cancel switch connector.
4. Remove the trunk end trim.
5. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### KNEE BOLSTER REMOVAL/INSTALLATION

1. Remove the lower panel. (See [LOWER PANEL REMOVAL/INSTALLATION.](#))
2. Remove the screws.



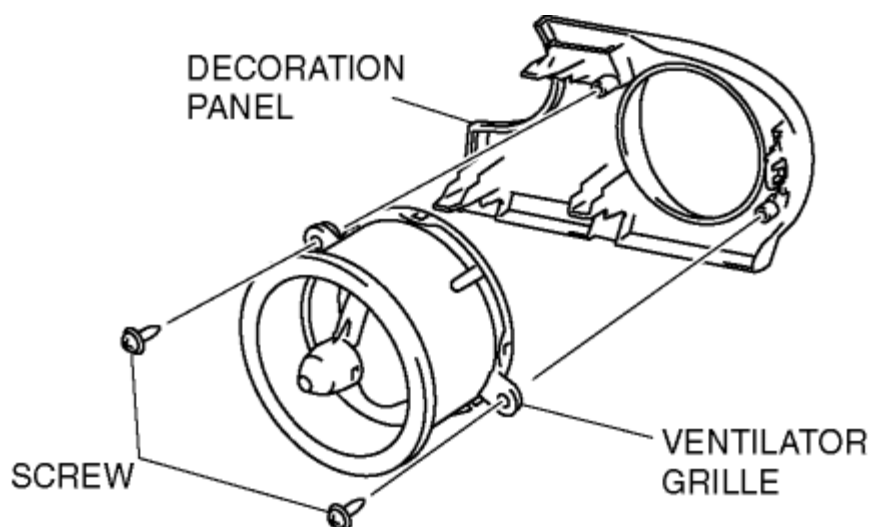
3. Remove the knee bolster.
4. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### VENTILATOR GRILLE REMOVAL/INSTALLATION

#### Driver's Side

1. Remove the decoration panel. (driver's side) (See [DECORATION PANEL REMOVAL/INSTALLATION.](#))
2. Remove the screws.

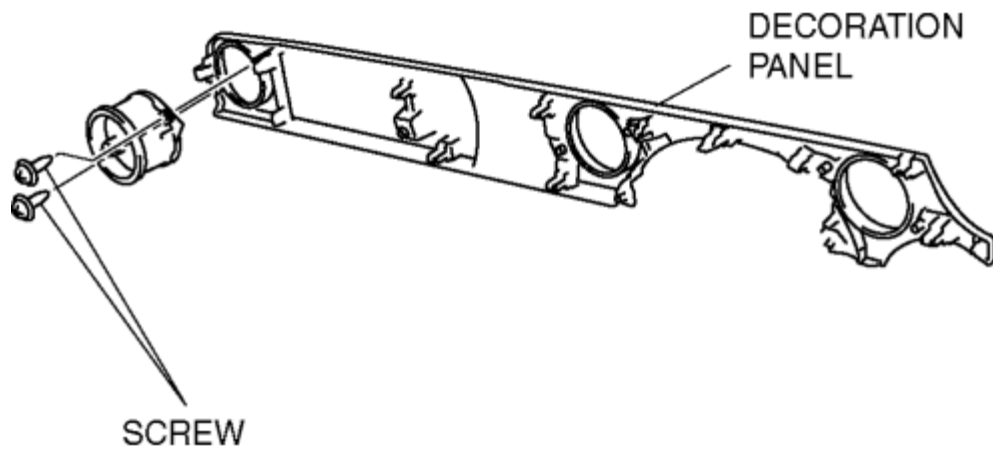


3. Remove the ventilator grille.
4. Install in the reverse order of removal.

#### Passenger's Side

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the side wall. (See [SIDE WALL REMOVAL/INSTALLATION.](#))
4. Remove the center panel unit. (See [CENTER PANEL UNIT REMOVAL/INSTALLATION.](#))
5. Remove the glove compartment. (See [GLOVE COMPARTMENT REMOVAL/INSTALLATION.](#))
6. Remove the decoration panel. (passenger's side) (See [DECORATION PANEL REMOVAL/INSTALLATION.](#))
7. Remove the screws.

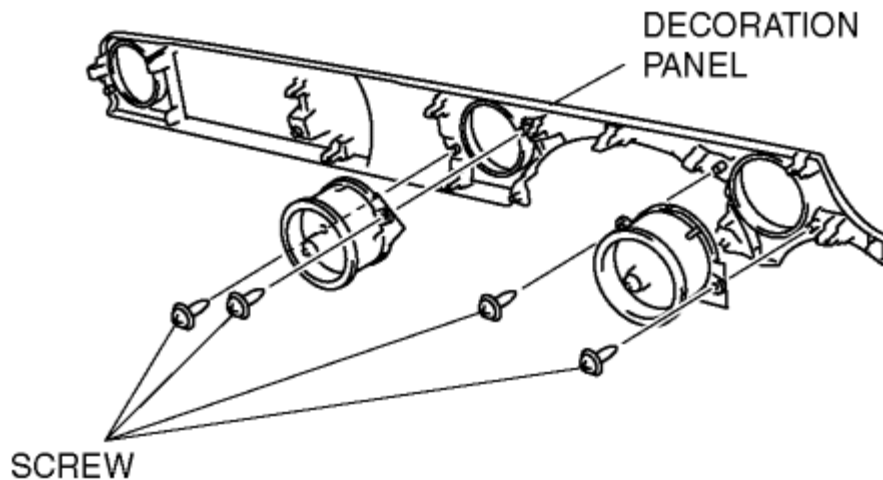




8. Remove the ventilator grille.
9. Install in the reverse order of removal.

## Center

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the side wall. (See [SIDE WALL REMOVAL/INSTALLATION.](#))
4. Remove the center panel unit. (See [CENTER PANEL UNIT REMOVAL/INSTALLATION.](#))
5. Remove the glove compartment. (See [GLOVE COMPARTMENT REMOVAL/INSTALLATION.](#))
6. Remove the decoration panel. (passenger's side) (See [DECORATION PANEL REMOVAL/INSTALLATION.](#))
7. Remove the screws.



8. Remove the ventilator grille.
9. Install in the reverse order of removal.



## 2008 - MX-5 - Body and Accessories

### SIDE WALL REMOVAL/INSTALLATION

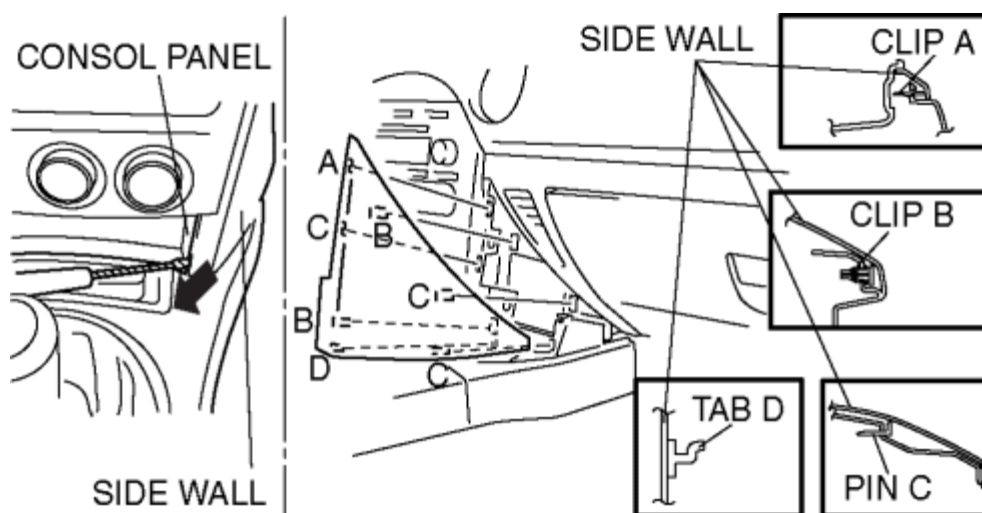
#### CAUTION:

- Do not pull the side wall ends outward to remove the side wall. The side wall and clips could be damaged.

#### NOTE:

- The removal procedure is the same for the driver's side.

1. Insert a tape-wrapped flathead screwdriver between the side wall and console panel, and detach clips A and B, pins C, and tab D while pulling the side wall in the direction shown by the arrow.



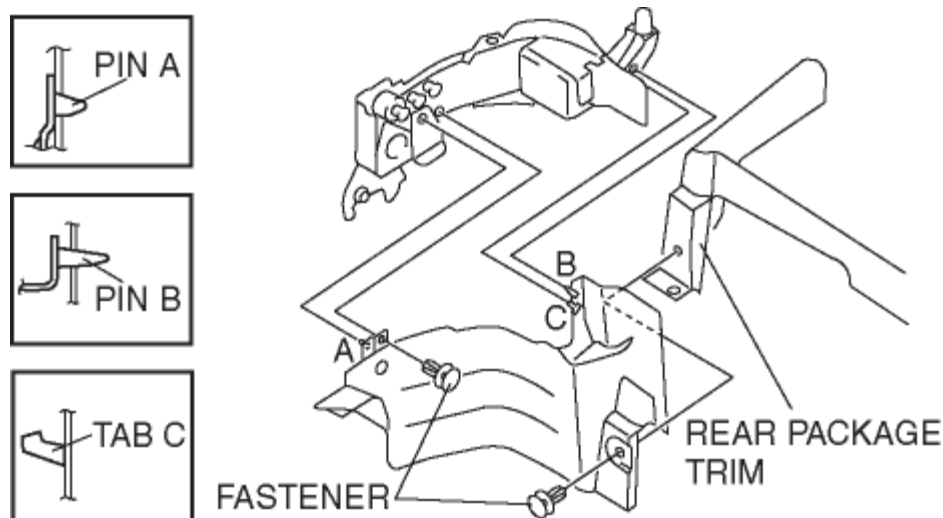
2. Remove the side wall.
3. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### REAR SIDE TRIM REMOVAL/INSTALLATION

#### Except Power Retractable Hardtop

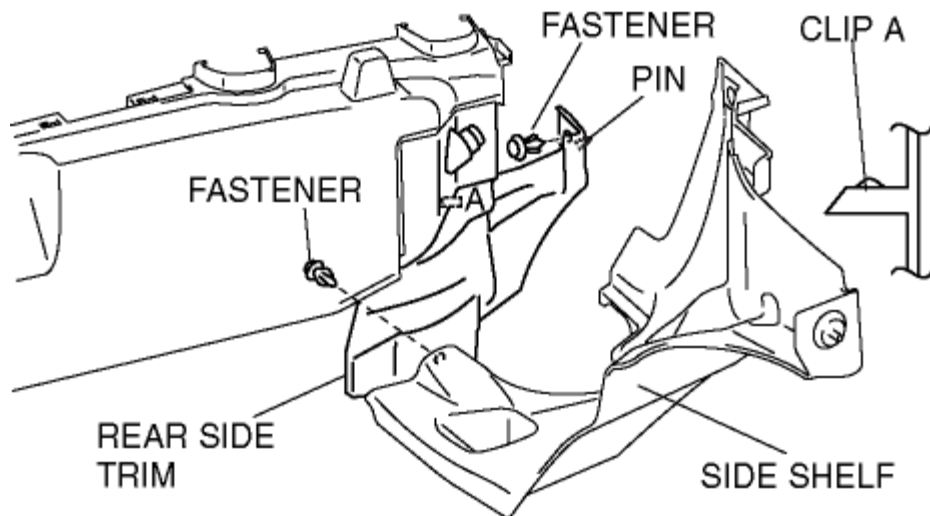
1. Remove the following parts:
  - a. Console (See [CONSOLE REMOVAL/INSTALLATION.](#))
  - b. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION.](#))
  - c. Scuff plate ([SCUFF PLATE REMOVAL/INSTALLATION.](#))
  - d. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION.](#))
  - e. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION.](#))
  - f. Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION.](#))
  - g. Back trim (See [BACK TRIM REMOVAL/INSTALLATION.](#))
  - h. Seat belt set plate (See [SEAT BELT REMOVAL/INSTALLATION.](#))
  - i. Seat back crossmember assembly (See [SEAT BACK CROSSMEMBER ASSEMBLY REMOVAL/INSTALLATION.](#))
2. Remove the fasteners.



3. Pull the rear side trim outward and detach pins A, B and tab C.
4. Remove the rear side trim.
5. Install in the reverse order of removal.

## Power Retractable Hardtop

1. Remove the following parts:
  - a. Console (See [CONSOLE REMOVAL/INSTALLATION.](#))
  - b. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION.](#))
  - c. Scuff plate ([SCUFF PLATE REMOVAL/INSTALLATION.](#))
  - d. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION.](#))
  - e. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION.](#))
  - f. Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION.](#))
  - g. Back trim (See [BACK TRIM REMOVAL/INSTALLATION.](#))
2. Disconnect the power retractable hardtop drain hose. (See [POWER RETRACTABLE HARDTOP DRAIN HOSE REMOVAL/INSTALLATION.](#))
3. Remove the fasteners.



4. Remove the clip A and pin.
5. Remove the rear side trim.
6. Install the reverse order of removal.

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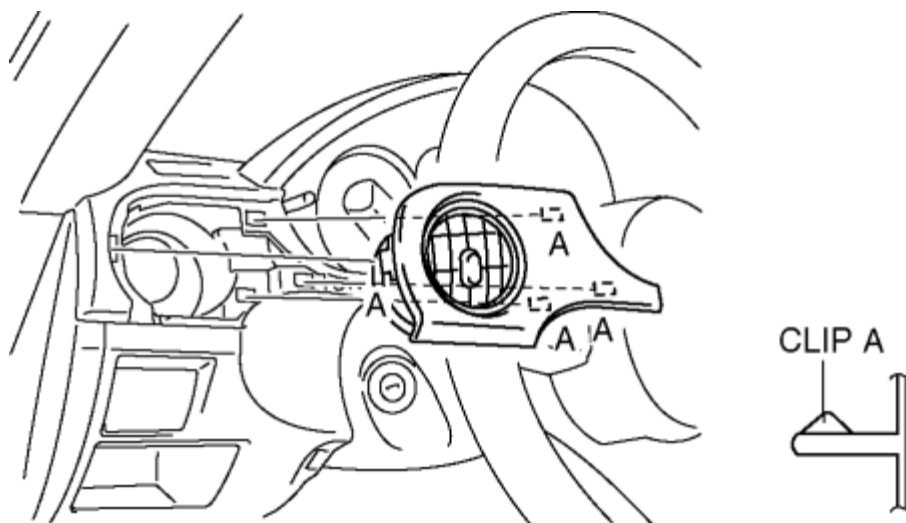
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## 2008 - MX-5 - Body and Accessories

### DECORATION PANEL REMOVAL/INSTALLATION

#### Driver's Side

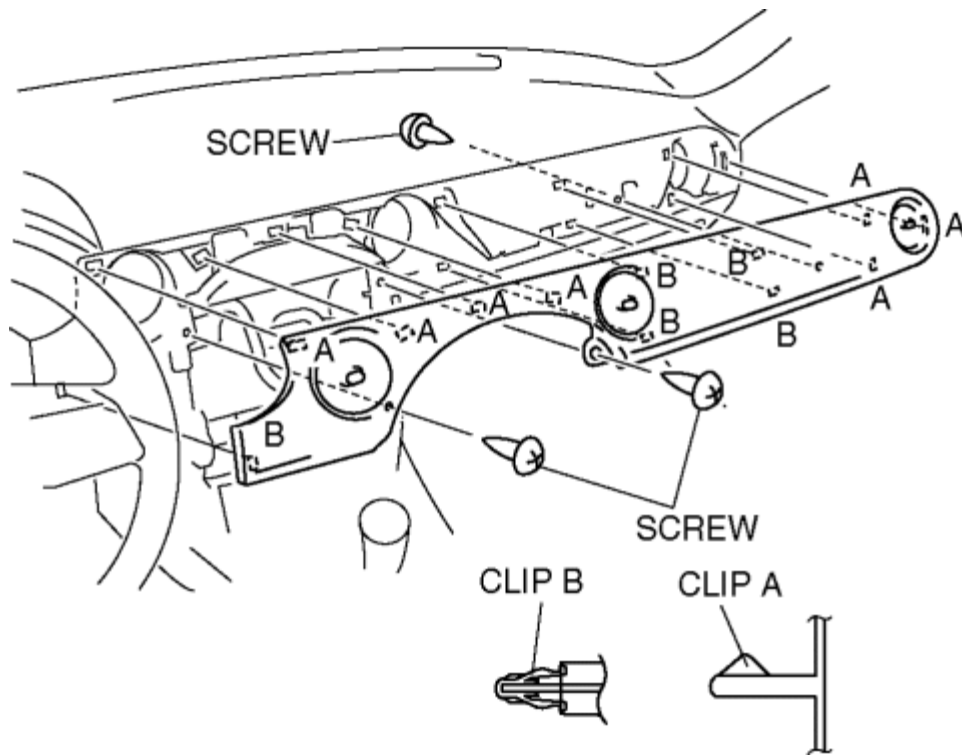
1. Pull the decoration panel outward and detach clips A.



2. Remove the decoration panel.
3. Install in the reverse order of removal.

#### Passenger's Side

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the side wall. (See [SIDE WALL REMOVAL/INSTALLATION](#).)
4. Remove the center panel unit. (See [CENTER PANEL UNIT REMOVAL/INSTALLATION](#).)
5. Remove the glove compartment. (See [GLOVE COMPARTMENT REMOVAL/INSTALLATION](#).)
6. Remove the three screws.



7. Pull the decoration panel outward and detach clips A and B.
8. Remove the decoration panel.
9. Install in the reverse order of removal.

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## 2008 - MX-5 - Body and Accessories

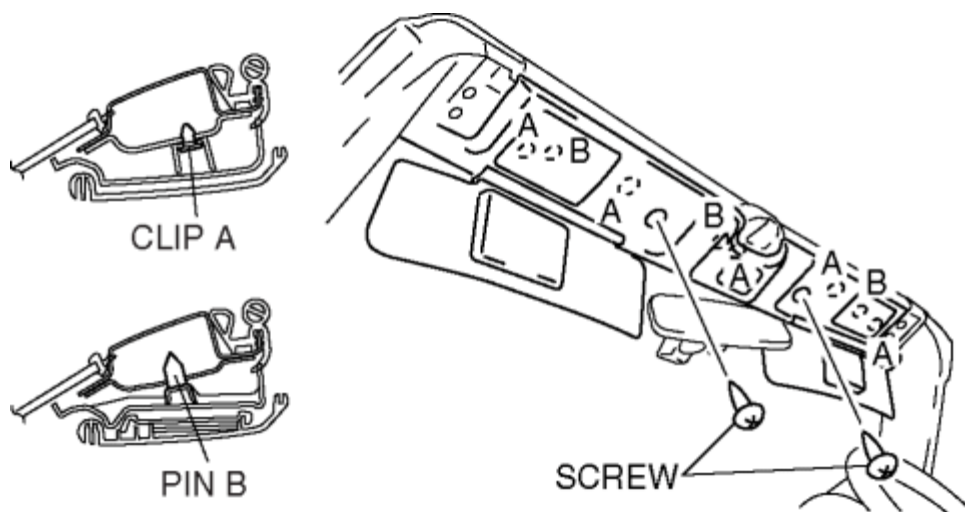
### FRONT HEADER TRIM REMOVAL/INSTALLATION

#### Removal

##### CAUTION:

- Do not twist or drop the front header trim, otherwise the vanity mirror could be damaged.

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the female wedge. (See [CONVERTIBLE TOP DISASSEMBLY/ASSEMBLY.](#))
4. Remove the map light. (See [MAP LIGHT REMOVAL/INSTALLATION.](#))
5. Remove the A-pillar trim. (See [A-PILLAR TRIM REMOVAL/INSTALLATION.](#))
6. Remove the screws.



7. Pull the front header trim toward you, then disengage the clips A and pin B from the body.
8. Remove the front header trim.

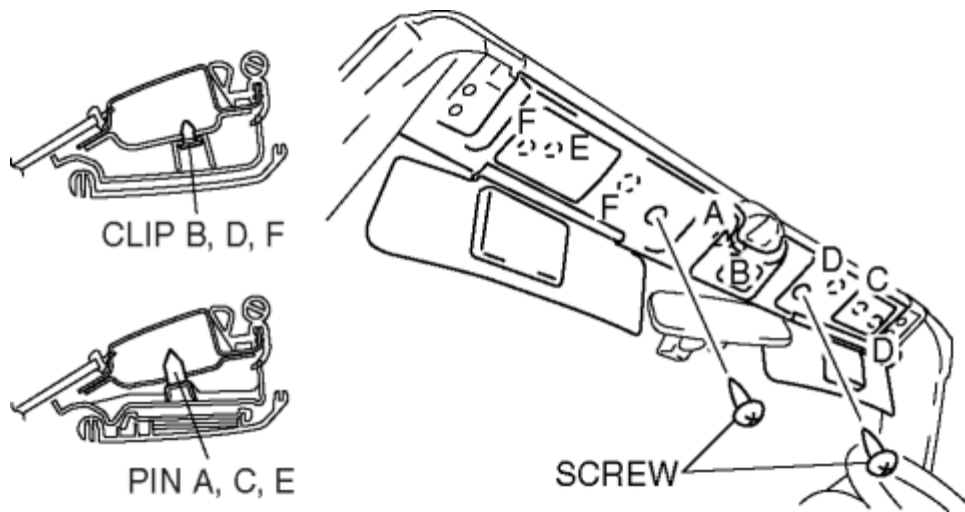
#### Installation

##### CAUTION:

- Do not twist or drop the front header trim, otherwise the vanity mirror could be damaged.
- If the front header trim is installed with the sunvisor pulled up, the vanity mirror could be damaged. Always install the front header trim with the sunvisor pulled down.



1. Install the pin A and clip B.



2. Pull down the sunvisor on the right, then install pin C and clips D.

3. Pull down the sunvisor on the left, then install pin E and clips F.

4. Install the screw.

5. Install the A-pillar trim. (See [A-PILLAR TRIM REMOVAL/INSTALLATION](#).)

6. Install the map light. (See [MAP LIGHT REMOVAL/INSTALLATION](#).)

7. Install the female wedge. (See [CONVERTIBLE TOP DISASSEMBLY/ASSEMBLY](#).)

8. Connect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)

9. Install the battery cover.

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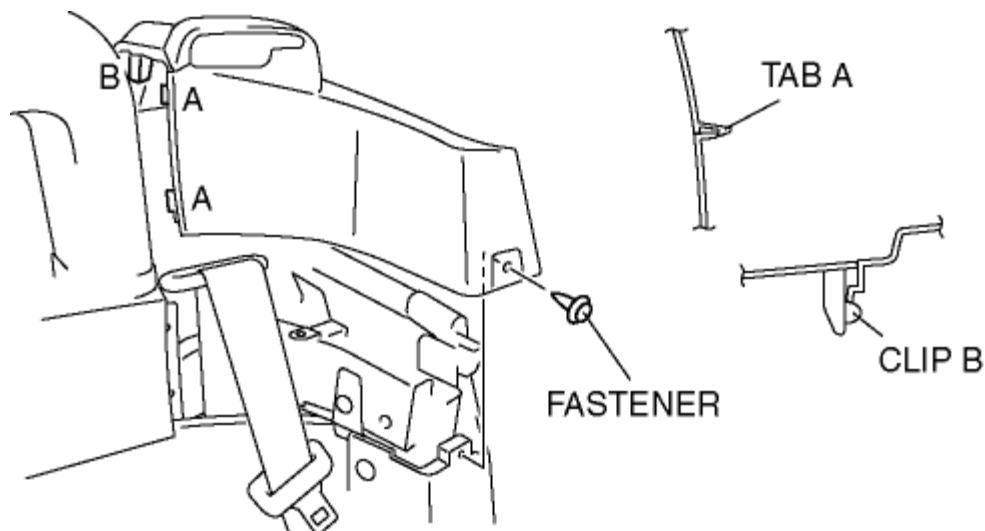
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## 2008 - MX-5 - Body and Accessories

### QUARTER TRIM REMOVAL/INSTALLATION

1. Remove the side striker. (detachable hardtop) (See [DETACHABLE HARDTOP DISASSEMBLY/ASSEMBLY](#))
2. Remove the fastener.

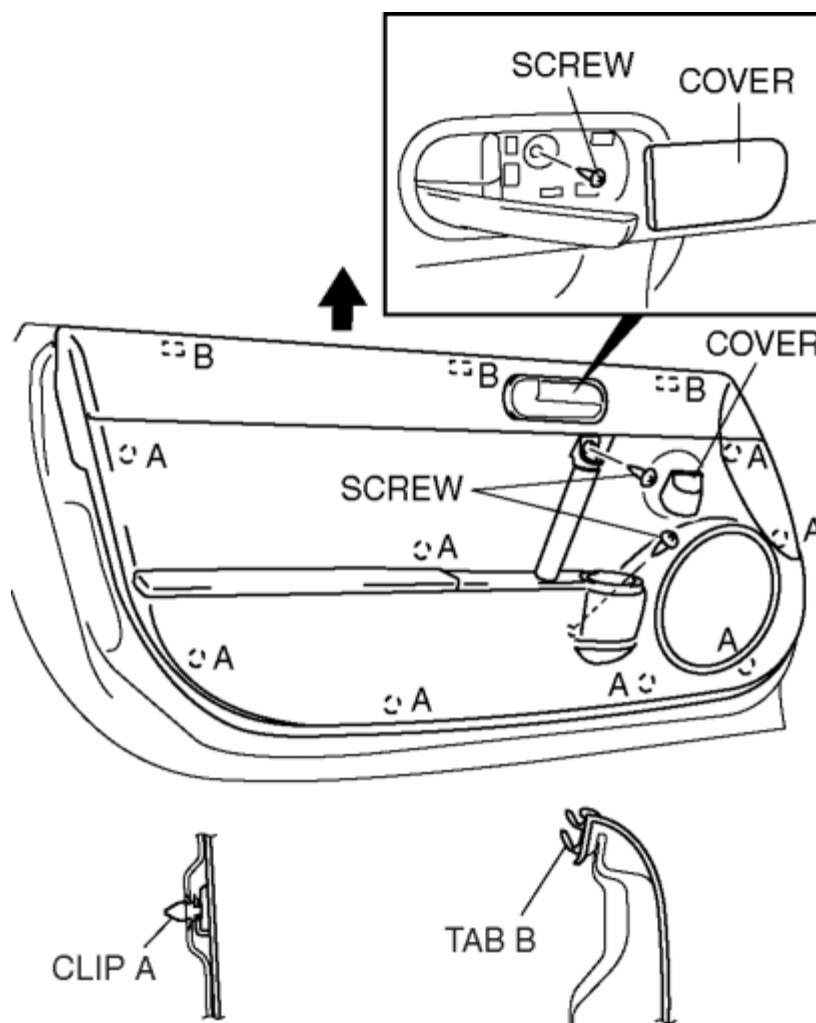


3. Remove the clips A.
4. Pull the quarter trim upward and detach clips B.
5. Remove the seat belt from the quarter trim through the slit in the quarter trim and remove the quarter trim.
6. Install in the reverse order of removal.

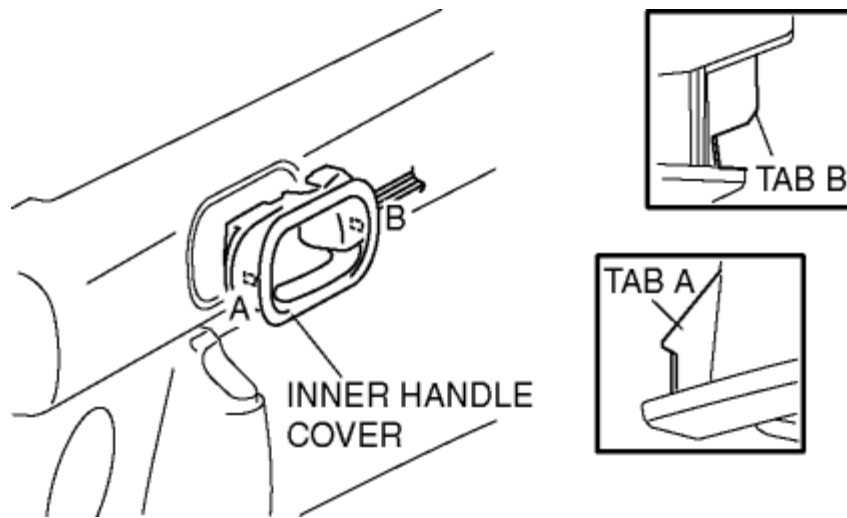
## 2008 - MX-5 - Body and Accessories

### DOOR TRIM REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the covers.



4. Remove the screws.
5. Detach clips A from the door trim using fastener remover.
6. Pull the door trim upward and detach tabs B from the door.
7. Disconnect the power outer mirror switch connector. (driver's side)
8. Remove the inner handle cover.



9. Remove the door trim.

10. Install in the reverse order of removal.

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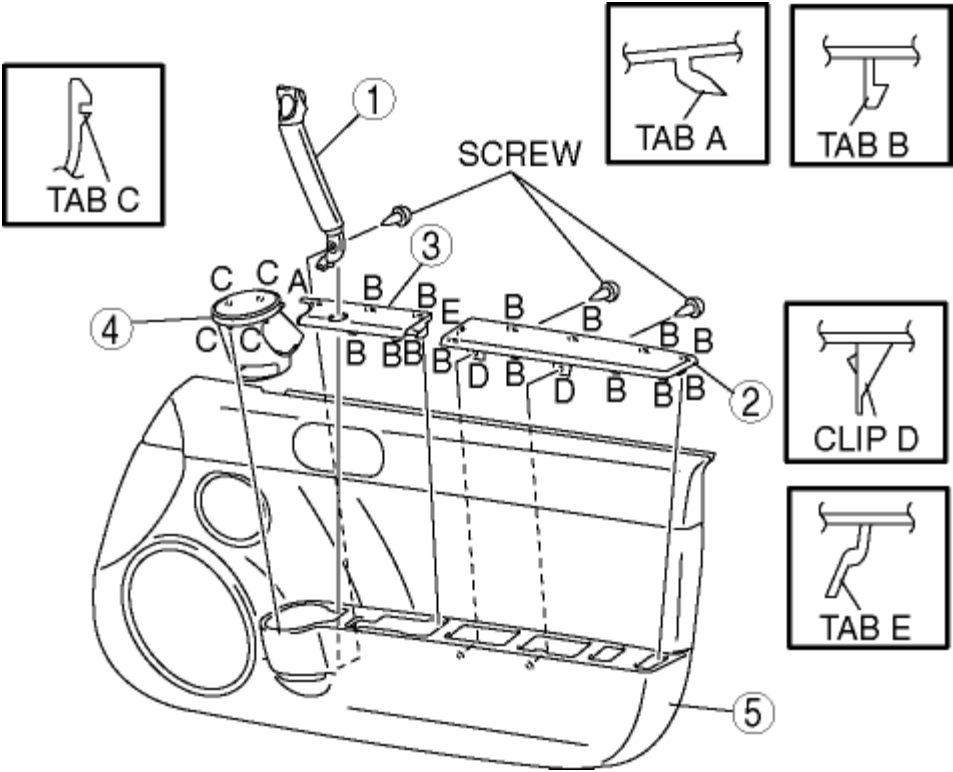
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2008 - MX-5 - Body and Accessories

DOOR TRIM DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.



1 Handle pull

2 Armrest

3 Switch panel

4 Cup holder

5 Door trim

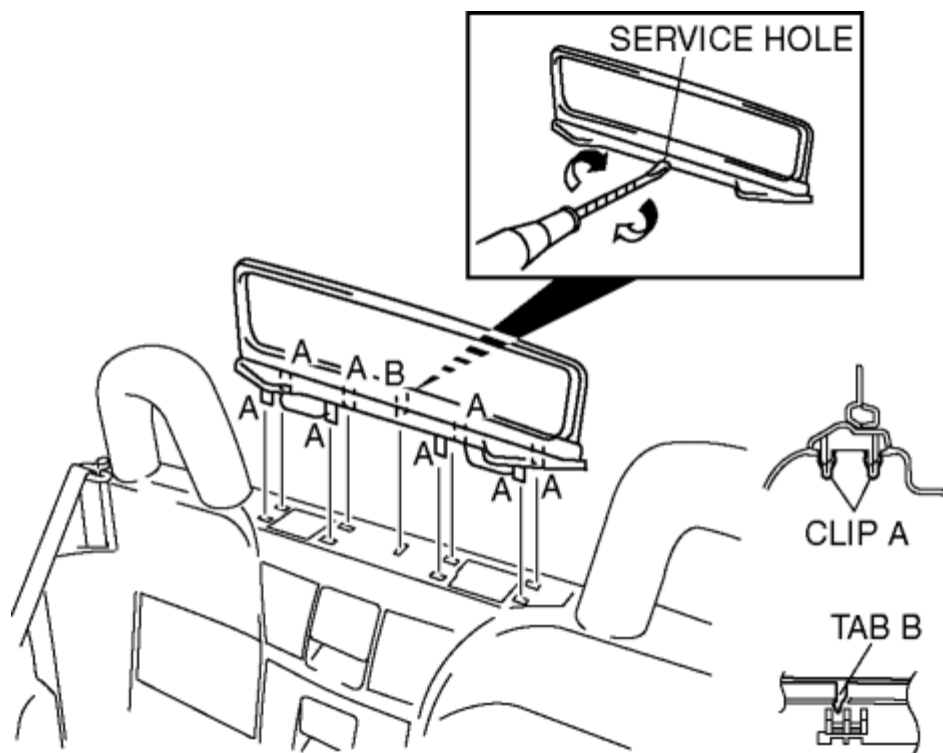
2. Assemble in the reverse order of disassembly.



## 2008 - MX-5 - Body and Accessories

### AEROBOARD REMOVAL/INSTALLATION

1. Insert a tape-wrapped flathead screwdriver into the service hole.



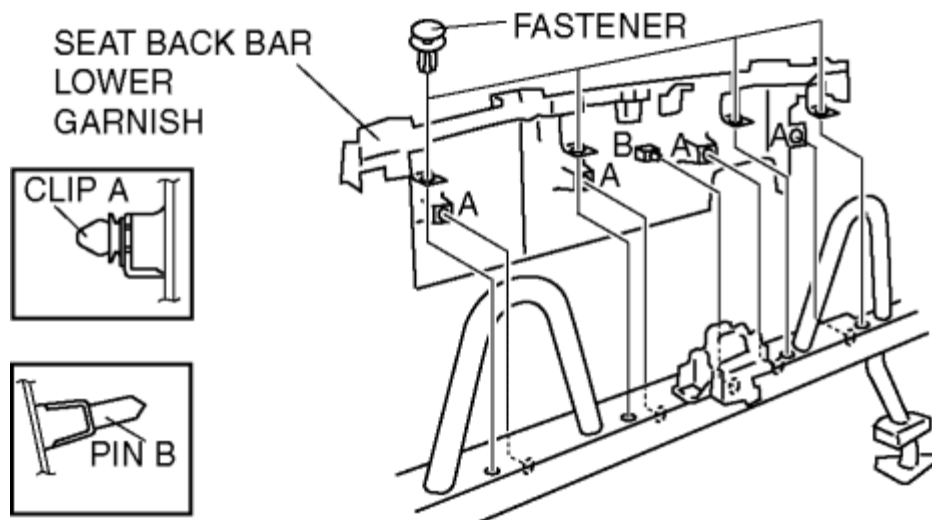
2. Twist the flathead screwdriver as indicated by the arrow to remove the clips A and tab B.
3. Remove the aeroboard.
4. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### SEAT BACK BAR LOWER GARNISH REMOVAL/INSTALLATION

#### Except Power Retractable Hardtop

1. Remove the following parts:
  - a. Console (See [CONSOLE REMOVAL/INSTALLATION.](#))
  - b. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION.](#))
  - c. Scuff plate ([SCUFF PLATE REMOVAL/INSTALLATION.](#))
  - d. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION.](#))
  - e. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION.](#))
  - f. Seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION.](#))
  - g. Back trim (See [BACK TRIM REMOVAL/INSTALLATION.](#))
2. Remove the fasteners.



3. Slide the seat back bar lower garnish to the vehicle rear and detach clips A and pin B.
4. Remove the seat back bar lower garnish.
5. Install in the reverse order of removal.

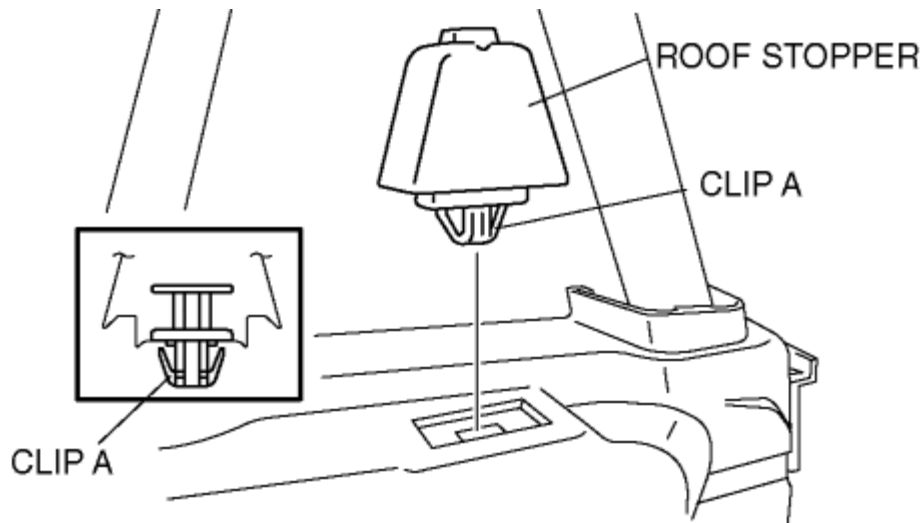
#### Power Retractable hardtop

1. Remove the following parts:



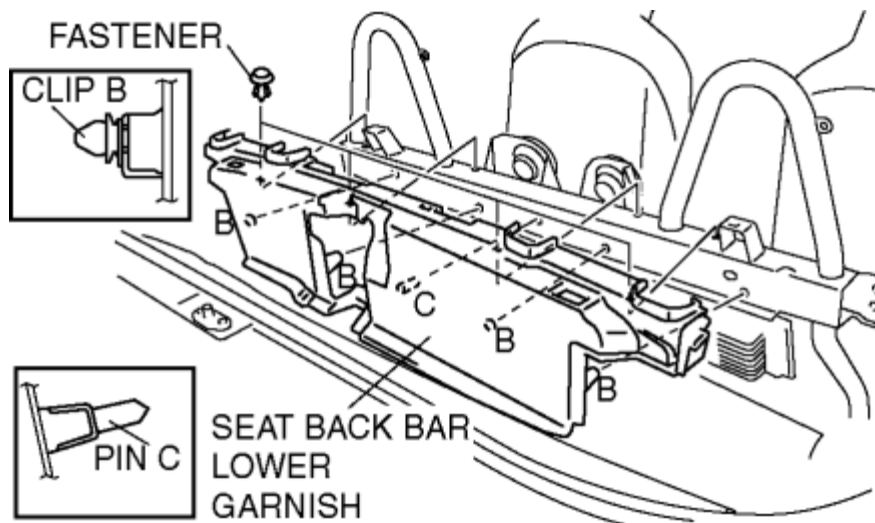
- a. Console (See [CONSOLE REMOVAL/INSTALLATION.](#))
- b. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION.](#))
- c. Scuff plate ([SCUFF PLATE REMOVAL/INSTALLATION.](#))
- d. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION.](#))
- e. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION.](#))
- f. Seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION.](#))
- g. Back trim (See [BACK TRIM REMOVAL/INSTALLATION.](#))
- h. Roof hook (See [ROOF HOOK REMOVAL/INSTALLATION.](#))

2. Remove the clip A.



3. Remove the roof stopper.

4. Remove the fasteners.



5. Slide the seat back bar lower garnish to the vehicle rear and detach clips B and pin C.

6. Remove the seat back bar lower garnish.

7. Install in the reverse order of removal.

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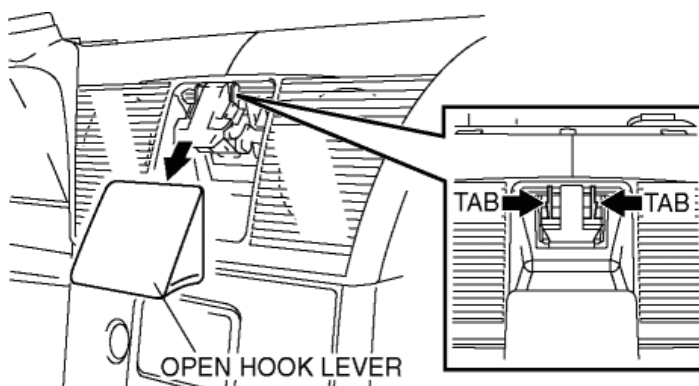
## 2008 - MX-5 - Body and Accessories

### BACK TRIM REMOVAL/INSTALLATION

1. Remove the following parts:

- Console (See [CONSOLE REMOVAL/INSTALLATION](#).)
- Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION](#).)
- Scuff plate ([SCUFF PLATE REMOVAL/INSTALLATION](#).)
- Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION](#).)
- Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION](#).)
- Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION](#).)

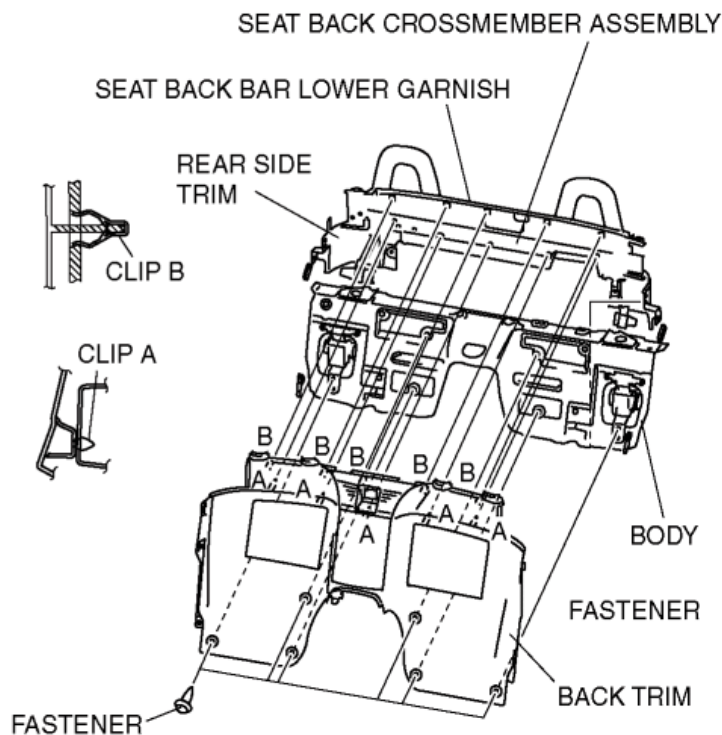
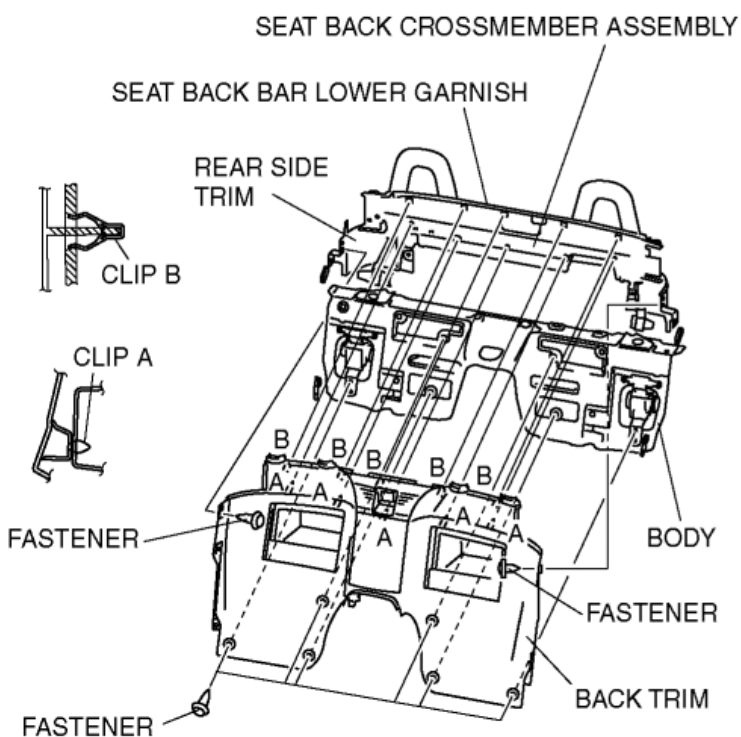
2. Pull the open hook lever outward and remove it while pinching the tabs as shown in the figure. (except the power retractable hardtop)



3. Remove the fasteners.

EXCEPT POWER RETRACTABLE HARDTOP

POWER RETRACTABLE HARDTOP



4. Pull the back trim outward and detach clips A and B.

5. Remove the back trim.
6. Install in the reverse order of removal.

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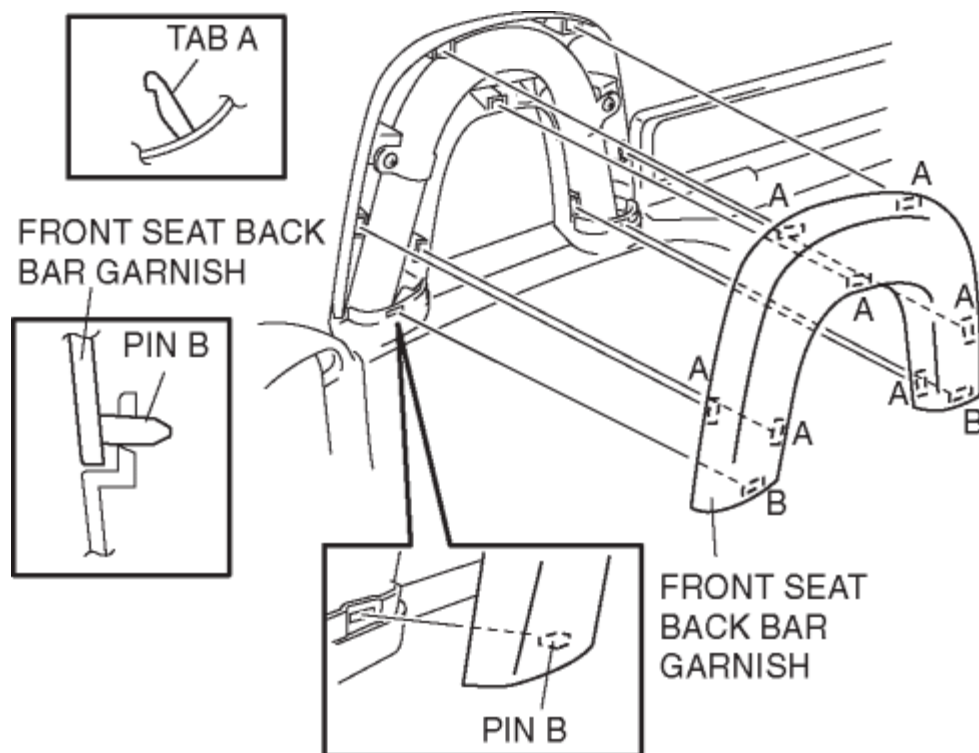
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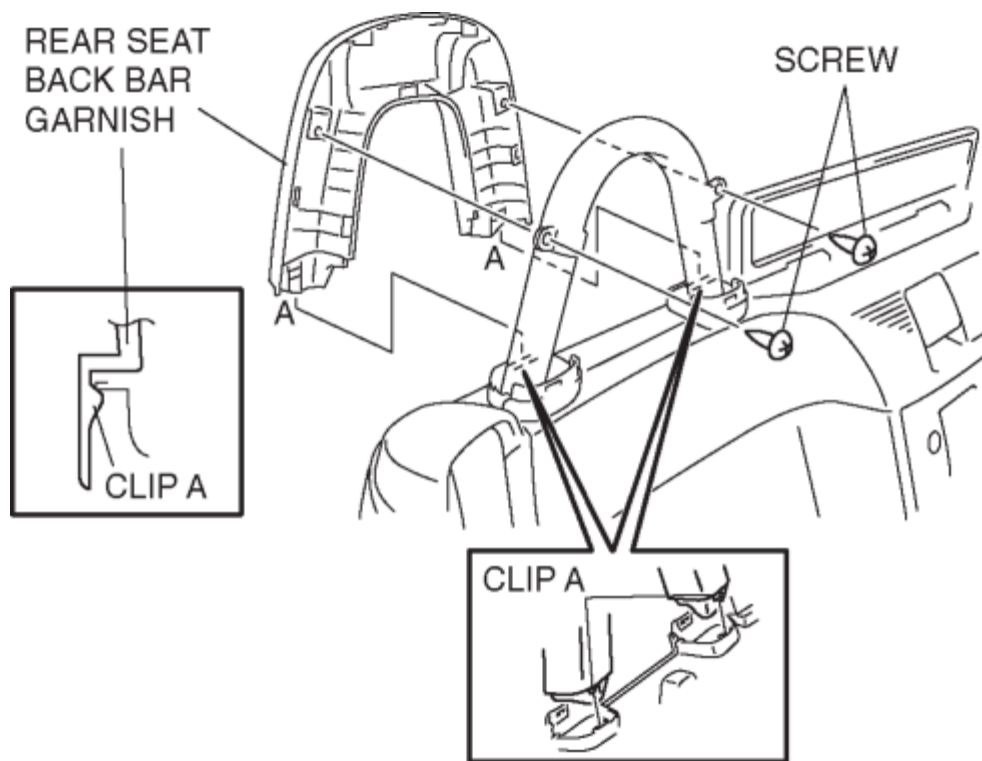
## 2008 - MX-5 - Body and Accessories

### SEAT BACK BAR GARNISH REMOVAL/INSTALLATION

1. Pull the front seat back bar garnish outward and detach tabs A and pins B.



2. Remove the front seat back bar garnish.
3. Remove the screws.



4. Pull the rear seat back bar garnish upward and detach clips A.
5. Remove the rear seat back bar garnish.
6. Install in the reverse order of removal.

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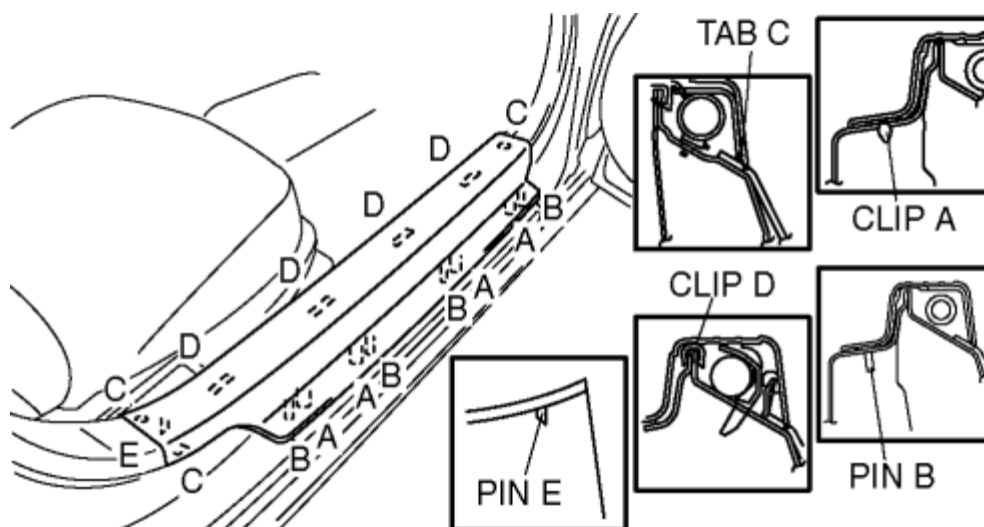
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## 2008 - MX-5 - Body and Accessories

### SCUFF PLATE REMOVAL/INSTALLATION

1. Pull the scuff plate upward while detaching tabs C, and then detach clips A and D, and pins B (4), E (1) from the body, and remove the scuff plate.



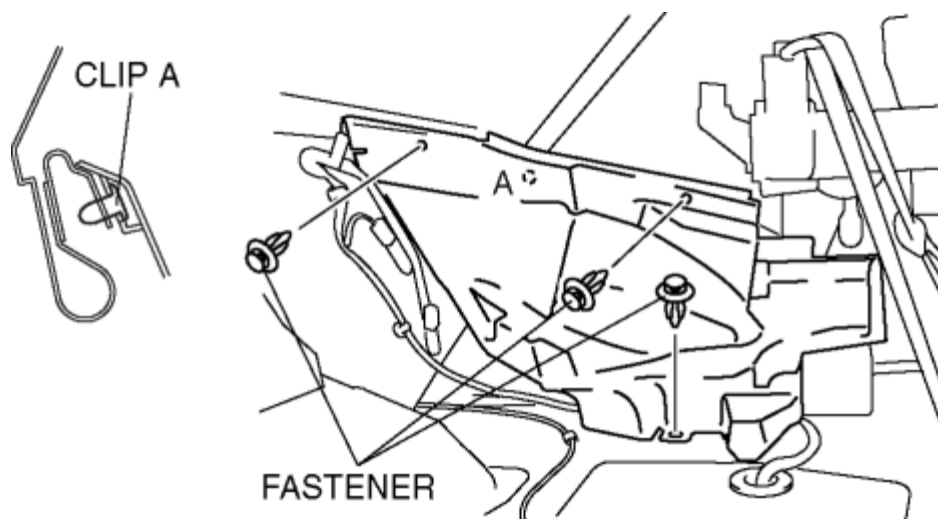
2. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### SIDE SHELF REMOVAL/INSTALLATION

#### Except Power Retractable Hardtop

1. Remove the following parts:
  - a. Console (See [CONSOLE REMOVAL/INSTALLATION.](#))
  - b. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION.](#))
  - c. Scuff plate ([SCUFF PLATE REMOVAL/INSTALLATION.](#))
  - d. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION.](#))
  - e. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION.](#))
  - f. Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION.](#))
  - g. Back trim (See [BACK TRIM REMOVAL/INSTALLATION.](#))
  - h. Seat belt set plate (See [SEAT BELT REMOVAL/INSTALLATION.](#))
  - i. Seat back crossmember assembly (See [SEAT BACK CROSSMEMBER ASSEMBLY REMOVAL/INSTALLATION.](#))
  - j. Rear side trim (See [REAR SIDE TRIM REMOVAL/INSTALLATION.](#))
  - k. Rear package trim (See [REAR PACKAGE TRIM REMOVAL/INSTALLATION.](#))
2. Remove the fasteners.



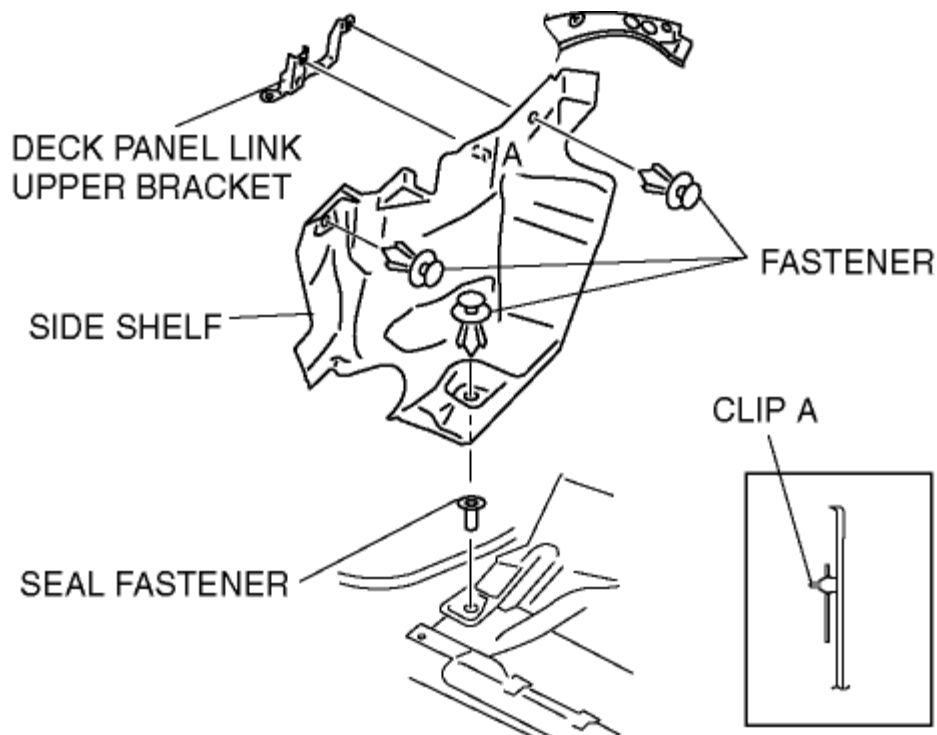
3. Pull the side shelf outward and detach clip A.



4. Remove the side shelf.
5. Install in the reverse order of removal.

## Power Retractable Hardtop

1. Fully open the deck panel.
2. Remove the following parts:
  - a. Console (See [CONSOLE REMOVAL/INSTALLATION.](#))
  - b. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION.](#))
  - c. Scuff plate ([SCUFF PLATE REMOVAL/INSTALLATION.](#))
  - d. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION.](#))
  - e. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION.](#))
  - f. Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION.](#))
  - g. Back trim (See [BACK TRIM REMOVAL/INSTALLATION.](#))
  - h. Rear side trim (See [REAR SIDE TRIM REMOVAL/INSTALLATION.](#))
3. Remove the fasteners.



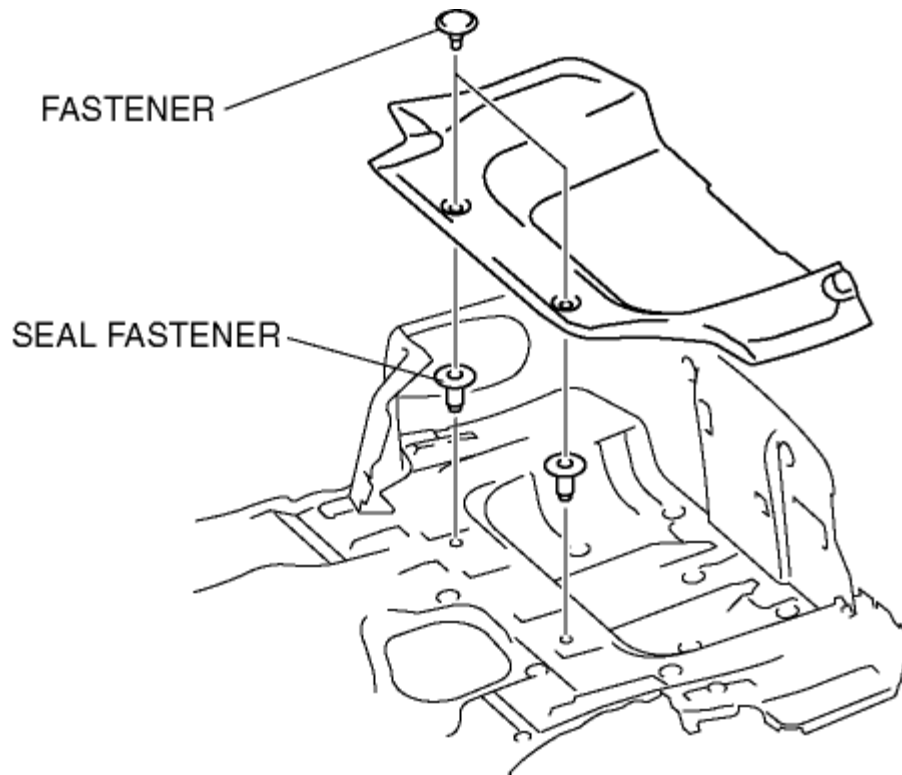
4. Pull the side shelf outward and detach clip A.
5. Remove the side shelf.
6. Install in the reverse order of removal.



## 2008 - MX-5 - Body and Accessories

### TRUNK MAT REMOVAL/INSTALLATION

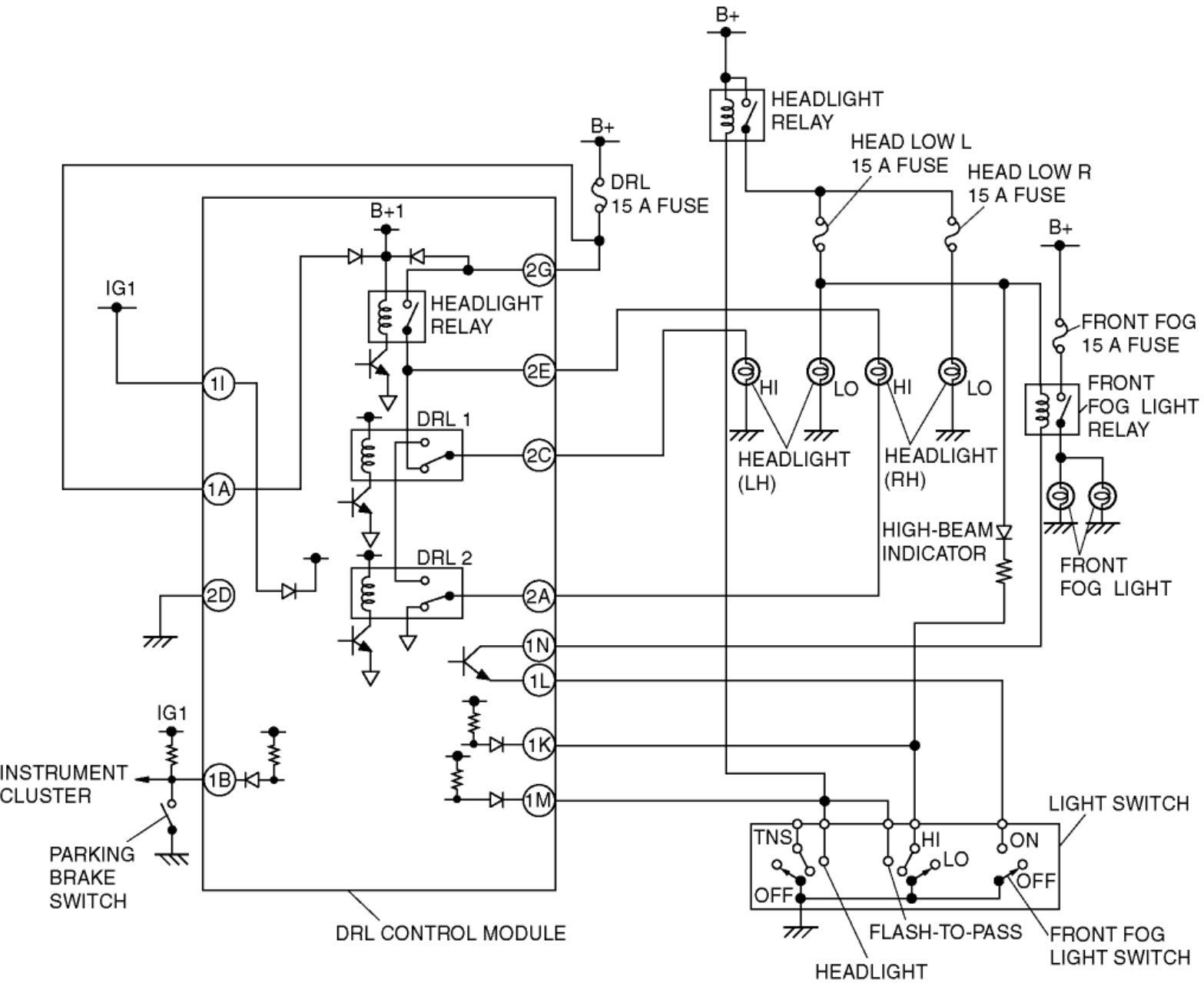
1. Remove the fasteners.



2. Remove the trunk mat.
3. Remove the seal fasteners.
4. Install in the reverse order of removal.

2008 - MX-5 - Body and Accessories

DRL SYSTEM WIRING DIAGRAM



This diagram illustrates the location of 17 numbered callouts for various components of a car. The callouts are distributed across the exterior, interior, and engine/chassis areas. Two inset boxes provide detailed views of the M15M-D and P66M-D engine models.

- Exterior Components:**
  - 1: Headlight
  - 2: Fog light
  - 3: Wheel
  - 4: Wheel
  - 5: Wheel
  - 6: Wheel
  - 7: Wheel
  - 8: Wheel
  - 9: Wheel
  - 10: Wheel
  - 11: Wheel
  - 12: Wheel
  - 13: Wheel
  - 14: Wheel
  - 15: Wheel
  - 16: Wheel
  - 17: Wheel
- Interior Components:**
  - 1: Headlight
  - 2: Fog light
  - 3: Wheel
  - 4: Wheel
  - 5: Wheel
  - 6: Wheel
  - 7: Wheel
  - 8: Wheel
  - 9: Wheel
  - 10: Wheel
  - 11: Wheel
  - 12: Wheel
  - 13: Wheel
  - 14: Wheel
  - 15: Wheel
  - 16: Wheel
  - 17: Wheel
- Engine/Chassis Components:**
  - 1: Headlight
  - 2: Fog light
  - 3: Wheel
  - 4: Wheel
  - 5: Wheel
  - 6: Wheel
  - 7: Wheel
  - 8: Wheel
  - 9: Wheel
  - 10: Wheel
  - 11: Wheel
  - 12: Wheel
  - 13: Wheel
  - 14: Wheel
  - 15: Wheel
  - 16: Wheel
  - 17: Wheel

- (See **HEADLIGHT AIMING.**)

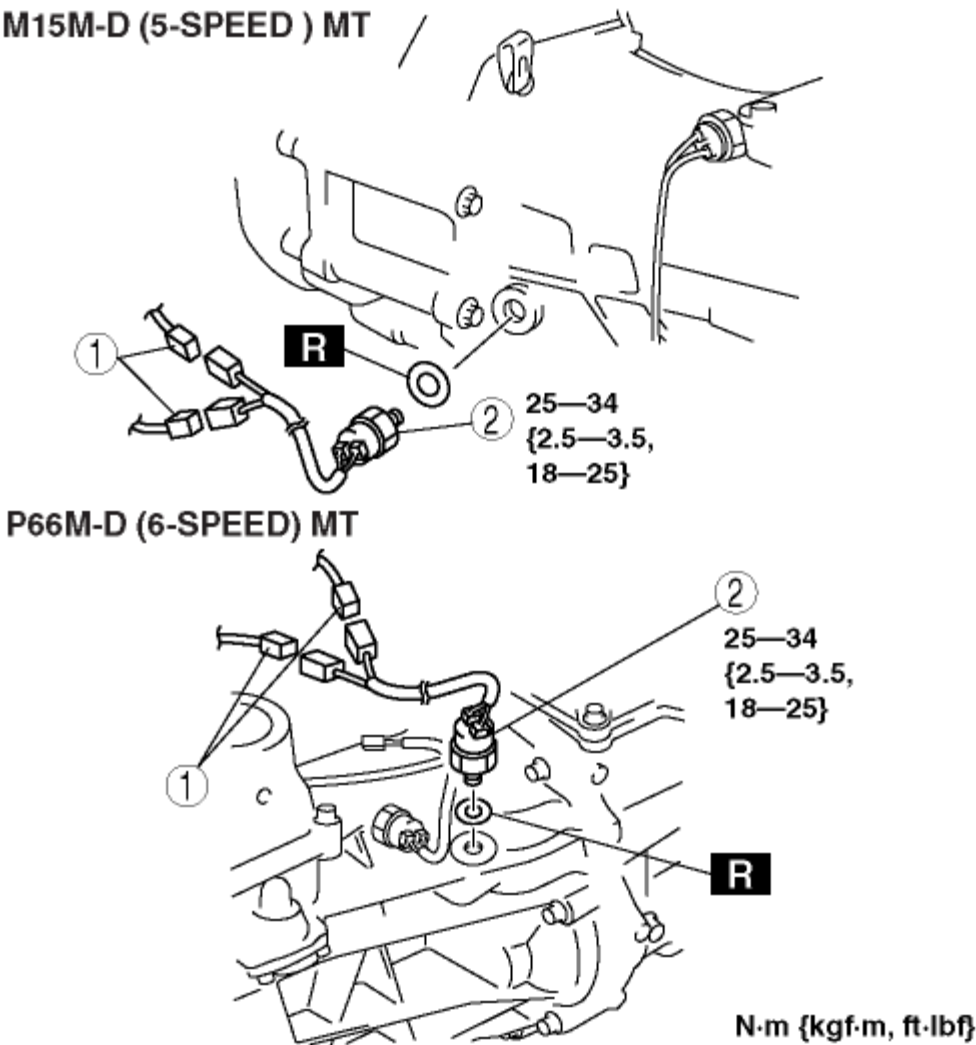
	(See <a href="#">HEADLIGHT BULB REMOVAL/INSTALLATION.</a> ) (See <a href="#">PARKING LIGHT BULB REMOVAL/INSTALLATION.</a> ) (See <a href="#">FRONT TURN LIGHT BULB REMOVAL/INSTALLATION.</a> ) (See <a href="#">DISCHARGE HEADLIGHT SERVICE WARNINGS.</a> )
2	Discharge headlight control module (See <a href="#">DISCHARGE HEADLIGHT CONTROL MODULE REMOVAL/INSTALLATION.</a> ) (See <a href="#">DISCHARGE HEADLIGHT SYSTEM INSPECTION.</a> )
3	Front fog light (See <a href="#">FRONT FOG LIGHT REMOVAL/INSTALLATION.</a> ) (See <a href="#">FRONT FOG LIGHT AIMING.</a> ) (See <a href="#">FRONT FOG LIGHT BULB REMOVAL/INSTALLATION.</a> )
4	Front side marker light (See <a href="#">FRONT SIDE MARKER LIGHT REMOVAL/INSTALLATION.</a> )
5	Rear combination light (See <a href="#">REAR COMBINATION LIGHT REMOVAL/INSTALLATION.</a> )
6	High-mount brake light (See <a href="#">HIGH-MOUNT BRAKE LIGHT REMOVAL/INSTALLATION.</a> )
7	License plate light (See <a href="#">LICENSE PLATE LIGHT REMOVAL/INSTALLATION.</a> )
8	Back-up light switch (See <a href="#">BACK-UP LIGHT SWITCH REMOVAL/INSTALLATION.</a> ) (See <a href="#">BACK-UP LIGHT SWITCH INSPECTION.</a> )
9	Combination switch (See <a href="#">COMBINATION SWITCH REMOVAL/INSTALLATION.</a> ) (See <a href="#">COMBINATION SWITCH DISASSEMBLY/ASSEMBLY.</a> )
10	Light switch (See <a href="#">LIGHT SWITCH REMOVAL/INSTALLATION.</a> ) (See <a href="#">LIGHT SWITCH INSPECTION.</a> ) (See <a href="#">FRONT FOG LIGHT SWITCH INSPECTION.</a> )
11	Hazard warning switch (See <a href="#">HAZARD WARNING SWITCH REMOVAL/INSTALLATION.</a> ) (See <a href="#">HAZARD WARNING SWITCH INSPECTION.</a> )
12	Flasher control module (See <a href="#">FLASHER CONTROL MODULE REMOVAL/INSTALLATION.</a> ) (See <a href="#">FLASHER CONTROL MODULE INSPECTION.</a> )
13	DRL control module (See <a href="#">DRL CONTROL MODULE REMOVAL/INSTALLATION.</a> )

	(See <a href="#">DRL CONTROL MODULE INSPECTION.</a> )
14	Map light  (See <a href="#">MAP LIGHT REMOVAL/INSTALLATION.</a> )  (See <a href="#">MAP LIGHT INSPECTION.</a> )
15	Trunk compartment light  (See <a href="#">TRUNK COMPARTMENT LIGHT REMOVAL/INSTALLATION.</a> )  (See <a href="#">TRUNK COMPARTMENT LIGHT INSPECTION.</a> )
16	Door switch  (See <a href="#">DOOR SWITCH REMOVAL/INSTALLATION.</a> )  (See <a href="#">DOOR SWITCH INSPECTION.</a> )
17	Ignition key illumination  (See <a href="#">IGNITION KEY ILLUMINATION BULB REMOVAL/INSTALLATION.</a> )

2008 - MX-5 - Body and Accessories

BACK-UP LIGHT SWITCH REMOVAL/INSTALLATION

- 1. Remove the battery cover.
- 2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
- 3. Loosen the starter installation bolts only enough that the starter is loose, but not removed. (P66M-D)
- (See [STARTER REMOVAL/INSTALLATION \[LF\]](#).)
- 4. Remove the transmission. (P66M-D) (See [TRANSMISSION REMOVAL/INSTALLATION \[P66M-D\]](#).)
- 5. Remove in the order indicated in the table.



1	Connector
---	-----------



2	Back-up light switch
---	----------------------

6. Install in the reverse order of removal.

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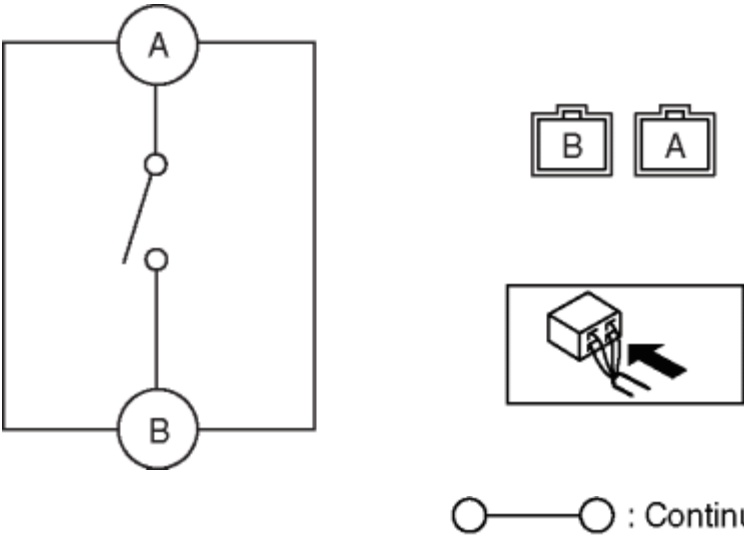
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2008 - MX-5 - Body and Accessories

BACK-UP LIGHT SWITCH INSPECTION

- 1. Disconnect the back-up light switch connector.
- 2. Inspect for continuity between the back-up light switch terminals using an ohmmeter.
  - If there is any malfunction, replace the back-up light switch.



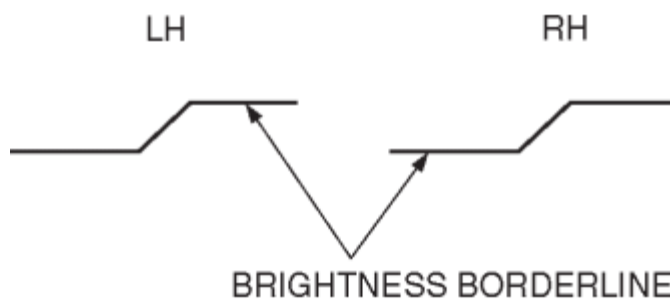
○ — ○ : Continuity

Shift lever position	Terminal	
	A	B
Reverse	○ — ○	○ — ○
Other		

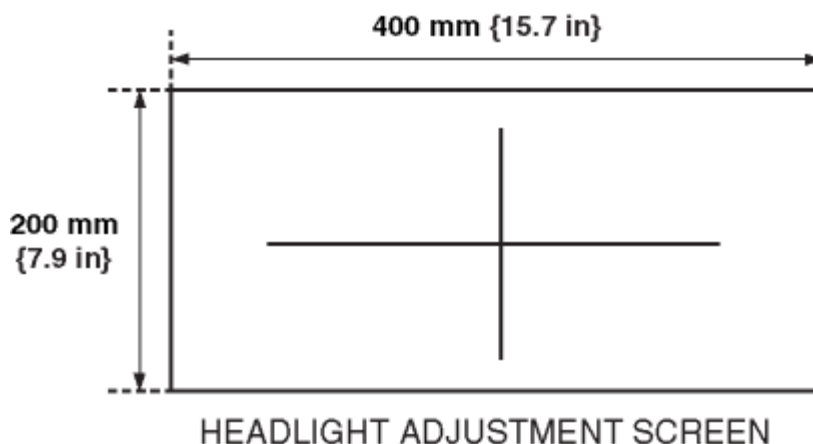
## 2008 - MX-5 - Body and Accessories

### HEADLIGHT AIMING

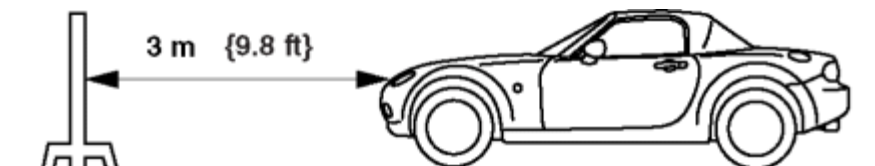
1. Point the headlight beams to a wall and verify that the headlight beams are as shown in the figure.



2. Make a headlight adjustment screen as shown in the figure using double-weight, white paper.

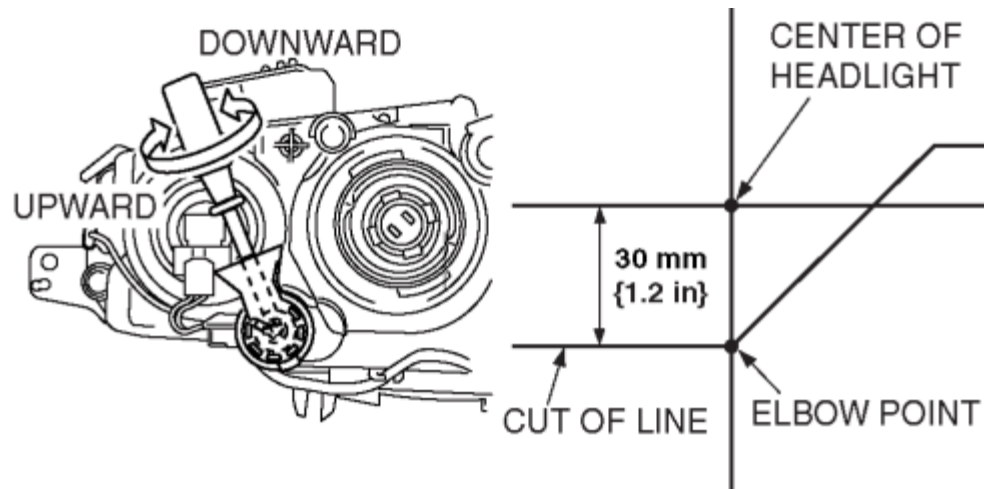


3. Adjust the tire pressure to the specification.
4. Position the unloaded vehicle on a flat, level surface.
5. Seat one person in the driver's seat.
6. Position the vehicle straight ahead and perpendicular to the white screen.
7. Set the headlights **3 m {9.8 ft}** from the white screen.



8. Place an object in front of the headlight not being adjusted to block its light beam.
9. Start the engine so that the battery remains charged.
10. Turn on the low-beam headlight.

11. Adjust by turning the aiming adjustment screw so that elbow point is in the position shown in the figure.



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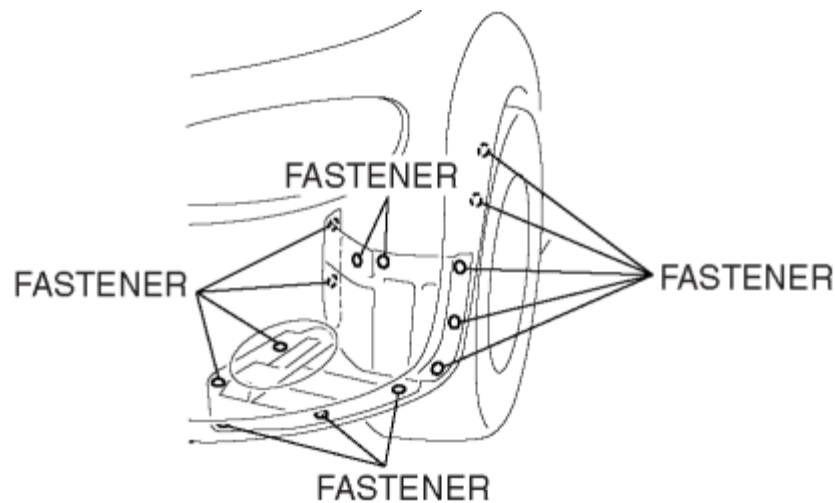
## 2008 - MX-5 - Body and Accessories

### HEADLIGHT BULB REMOVAL/INSTALLATION

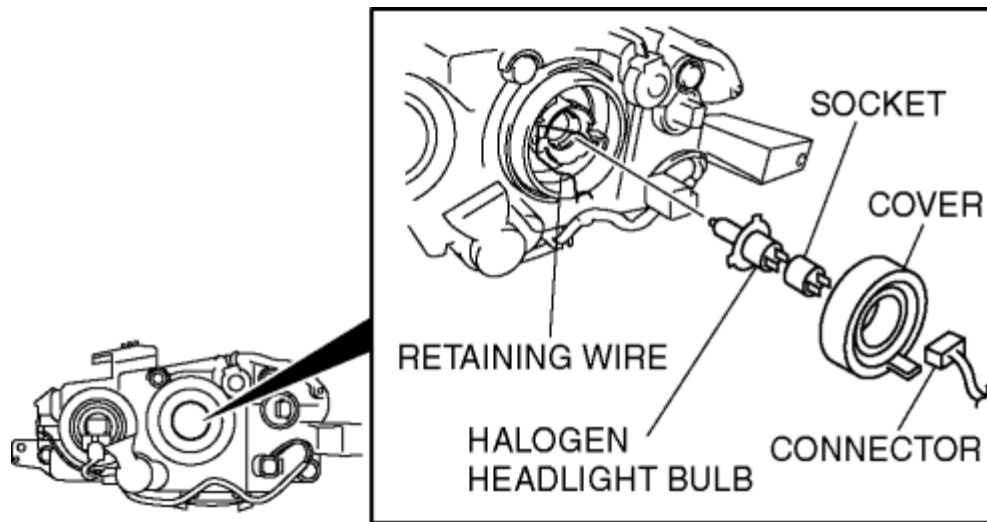
#### Low-beam

##### Halogen type

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the washer tank. (RH) (See [WASHER TANK REMOVAL/INSTALLATION.](#))
4. Remove the fasteners. (LH)



5. Slightly bent back the mudguard.
6. Disconnect the connector.



**CAUTION:**

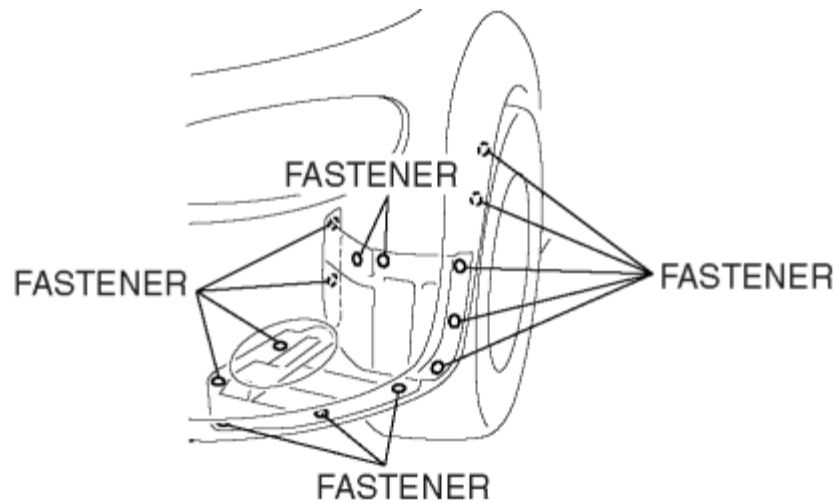
- A halogen bulb generates extremely high heat when it is illuminated. If the surface of the bulb is soiled, excessive heat will build up and the life of the bulb will be shortened. When replacing the bulb, hold the metal flange, not the glass. Wipe off any finger prints before installation.

7. Remove the cover.
8. Remove the socket, then remove the headlight bulb.
9. Install in the reverse order of removal.

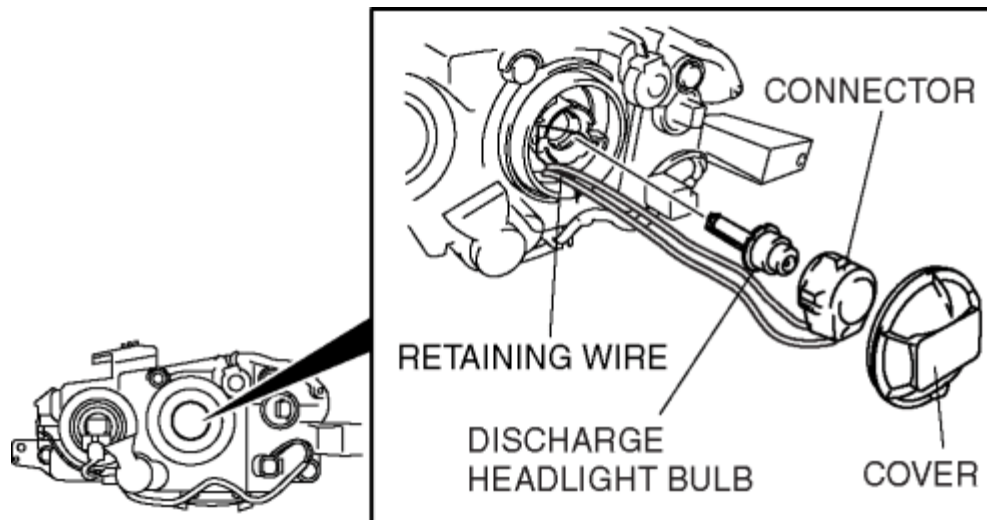
**Discharge type**

**WARNING:**

- Incorrect servicing of the discharge headlights could result in electrical shock. Before servicing the discharge headlights, always refer to the discharge headlight service warnings. (See **DISCHARGE HEADLIGHT SERVICE WARNINGS**.)
1. Remove the battery cover.
  2. Disconnect the negative battery cable. (See **BATTERY REMOVAL/INSTALLATION [LF]**.)
  3. Remove the washer tank. (RH) (See **WASHER TANK REMOVAL/INSTALLATION**.)
  4. Remove the fasteners. (LH)



5. Slightly bent back the mudguard.
6. Remove the cover.



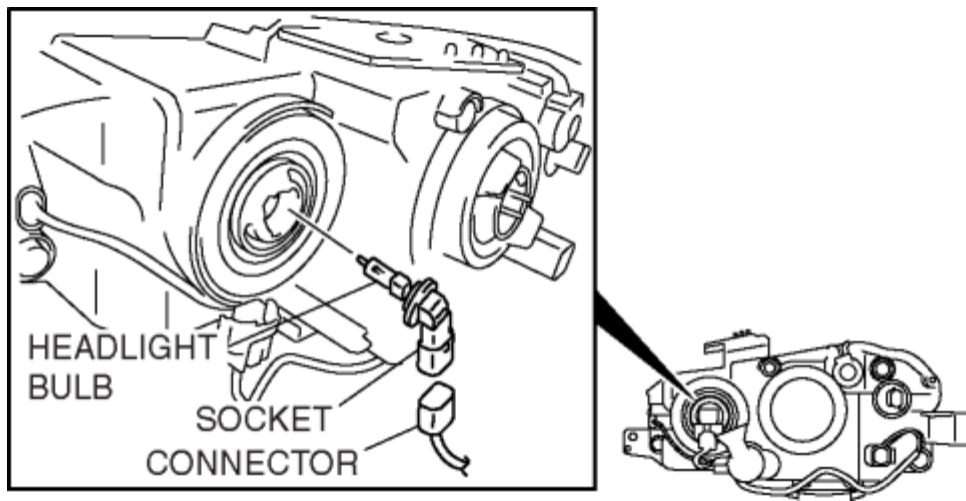
**CAUTION:**

- The bulb generates extremely high heat when it is illuminated. If the surface of the bulb is soiled, excessive heat will build up and the life of the bulb will be shortened. When replacing the bulb, hold the metal flange, not the glass. Wipe off any finger prints before installation.

7. Remove the connector, then remove the discharge headlight bulb.
8. Install in the reverse order of removal.

**High-beam**

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Disconnect the connector.



**CAUTION:**

- A halogen bulb generates extremely high heat when it is illuminated. If the surface of the bulb is soiled, excessive heat will build up and the life of the bulb will be shortened. When replacing the bulb, hold the metal flange, not the glass. Wipe off any finger prints before installation.

4. Remove the socket, then remove the headlight bulb.
5. Install in the reverse order of removal.

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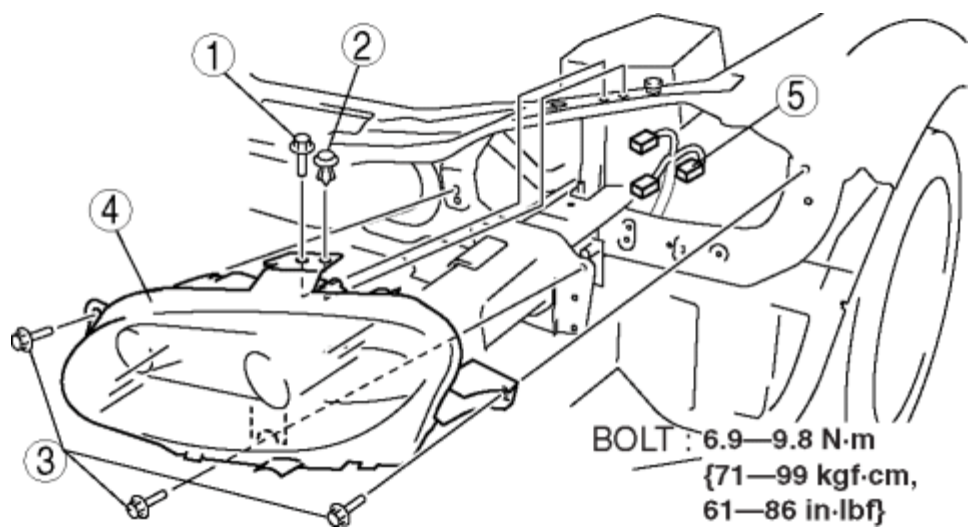
2008 - MX-5 - Body and Accessories

FRONT COMBINATION LIGHT REMOVAL/INSTALLATION

WARNING:

- Incorrect servicing of the discharge headlights could result in electrical shock. Before servicing the discharge headlights, always refer to the discharge headlight service warnings. (See [DISCHARGE HEADLIGHT SERVICE WARNINGS](#).)

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the front bumper. (See [FRONT BUMPER REMOVAL/INSTALLATION](#).)
4. Remove in the order indicated in the table.



1	Bolt A
2	Fastener
3	Bolt B
4	Front combination light
5	Connector

5. Install in the reverse order of removal.

6. Adjust the headlight aiming. (See [HEADLIGHT AIMING](#))

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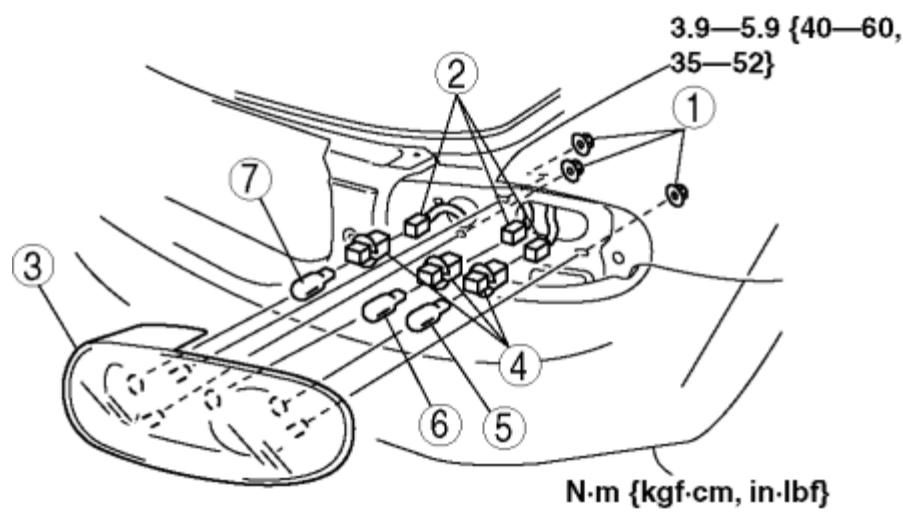
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REAR COMBINATION LIGHT REMOVAL/INSTALLATION

- 1. Remove the battery cover.
- 2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
- 3. Remove the trunk end trim.(See [TRUNK END TRIM REMOVAL/INSTALLATION](#).)
- 4. Remove the trunk side trim.(See [TRUNK SIDE TRIM REMOVAL/INSTALLATION](#).)
- 5. Remove in the order indicated in the table.



1	Nut
2	Connector
3	Rear combination light
4	Socket
5	Brake light/taillight bulb
6	Rear turn light bulb
7	Back-up light bulb

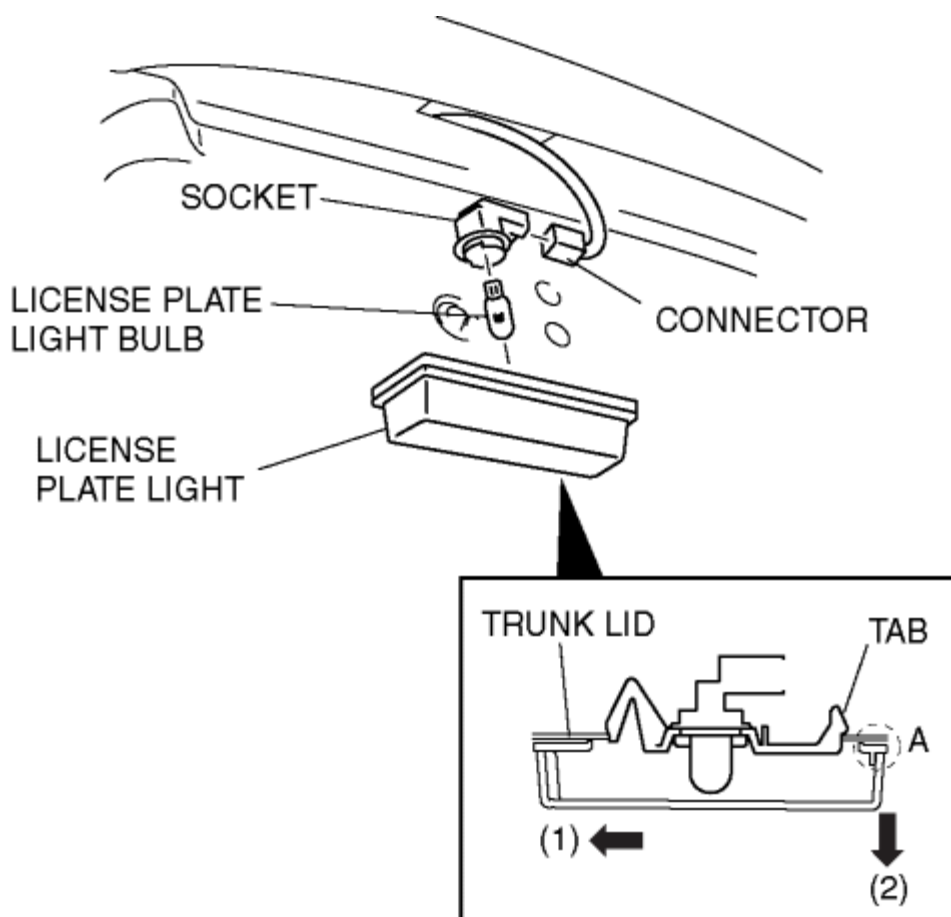
- 6. Install in the reverse order of removal.



## 2008 - MX-5 - Body and Accessories

### LICENSE PLATE LIGHT REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Move the license plate light in the direction of the arrow (1) and detach the tab.

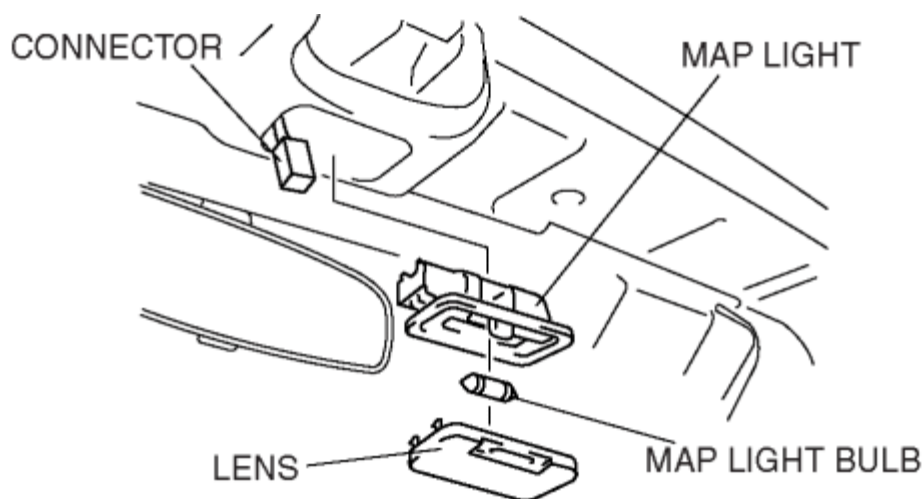


4. Pull area A of the license plate light in the direction of the arrow (2) and remove the license plate light.
5. Disconnect the connector.
6. Detach the socket and remove the license plate light bulb.
7. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### MAP LIGHT REMOVAL/INSTALLATION

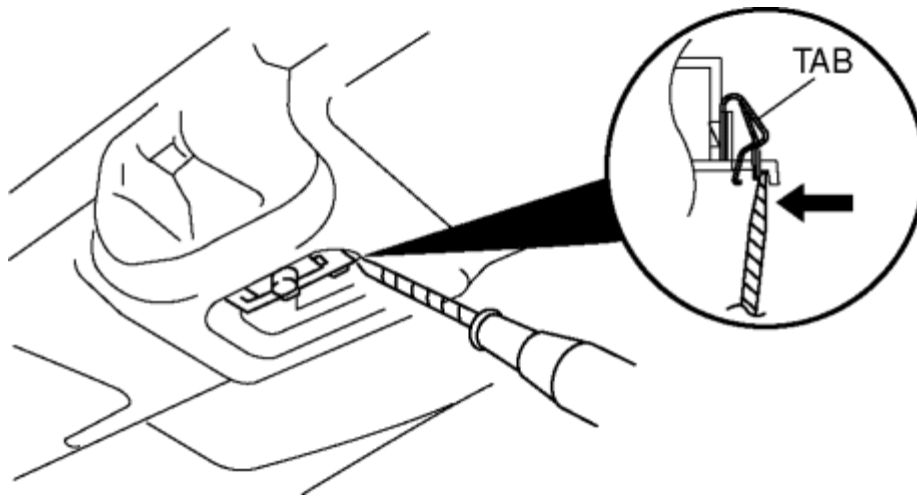
1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the lens.



4. Remove the map light bulb
5. Remove the map light. (See [Map Light Removal Note](#).)
6. Disconnect the connector.
7. Install in the reverse order of removal.

### Map Light Removal Note

1. Insert a tape-wrapped flathead screwdriver into the gap between the headliner and the map light.
2. Press the tab, and remove the map light.



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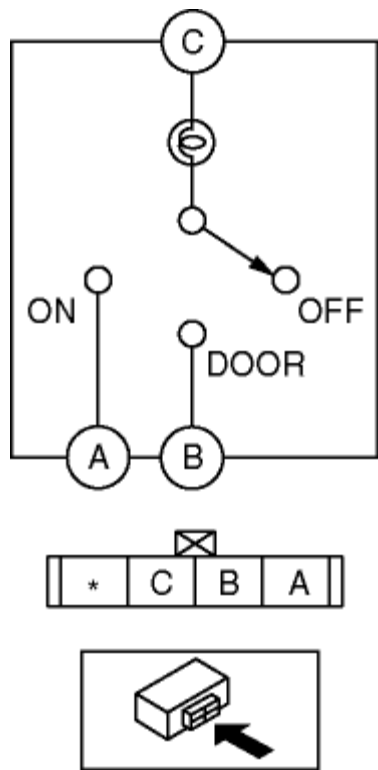
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2008 - MX-5 - Body and Accessories

MAP LIGHT INSPECTION

1. Verify that the continuity between the map light terminals is as indicated in the table.



- If not as indicated in the table, replace the map light.

○ — (○) — ○ : Bulb

Switch position	Terminal		
	A	C	B
ON	○ — (○) — ○		
DOOR		○ — (○) — ○	
OFF			

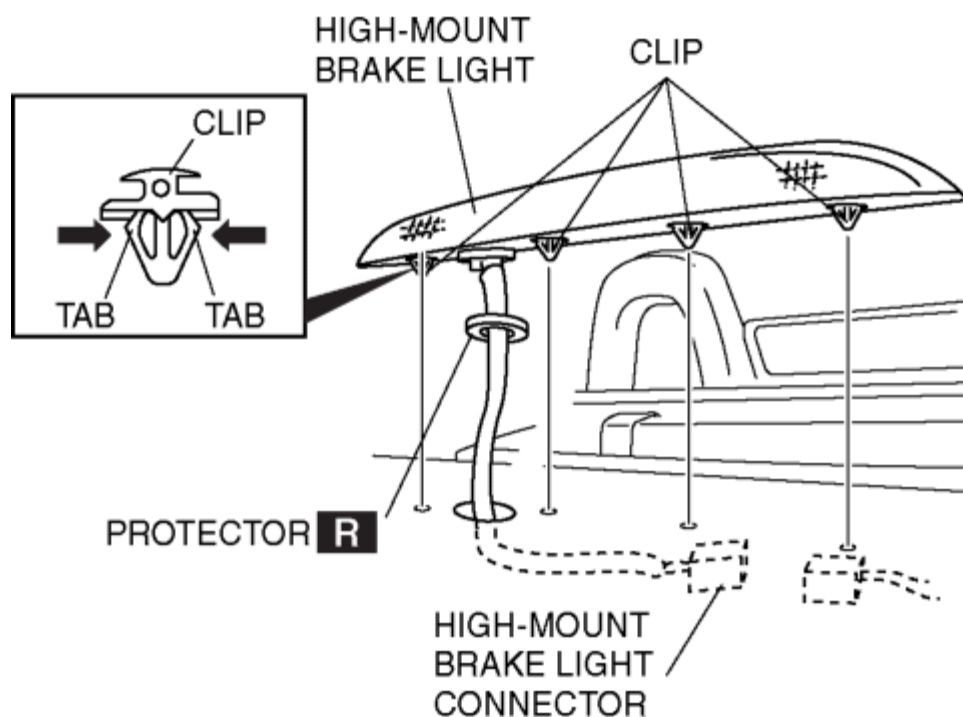


## 2008 - MX-5 - Body and Accessories

### HIGH-MOUNT BRAKE LIGHT REMOVAL/INSTALLATION

#### Except Power Retractable hardtop

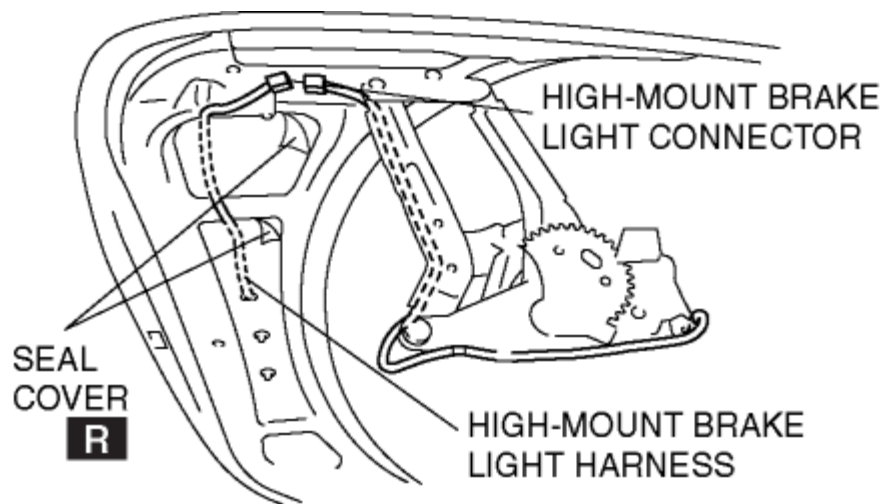
1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the partition board. (See [PARTITION BOARD REMOVAL/INSTALLATION.](#))
4. Disconnect the high-mount brake light connector.
5. Press the tabs and remove the clips.



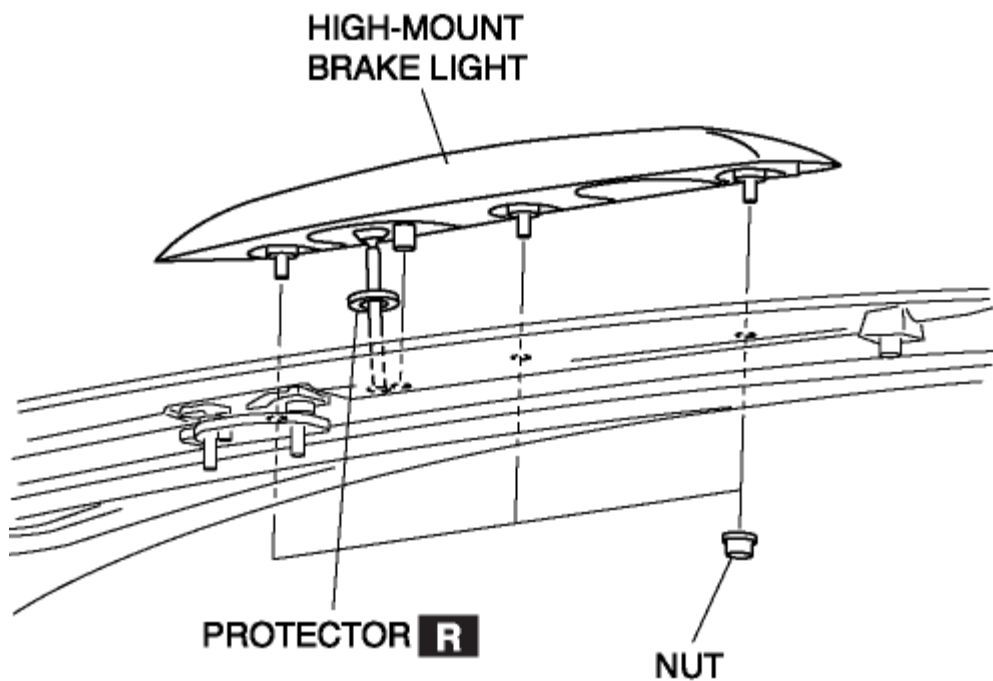
6. Install in the reverse order of removal.

#### Power Retractable Hardtop

1. Fully open the deck panel.
2. Partially peel back the seal cover.
3. Disconnect the high-mount brake light connector.
4. Remove the wiring harness and connector of the high-mount brake light from the deck panel.



5. Remove the nuts.



6. Remove the high-mount brake light.

7. Install in the reverse order of removal.

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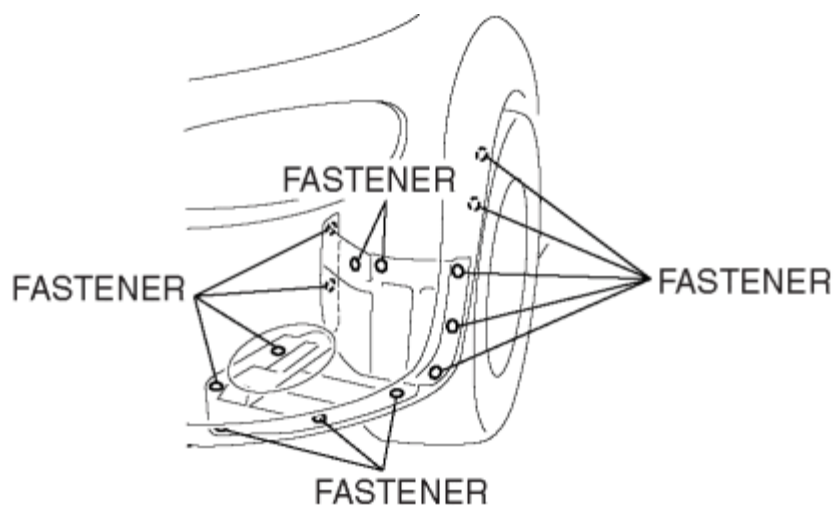
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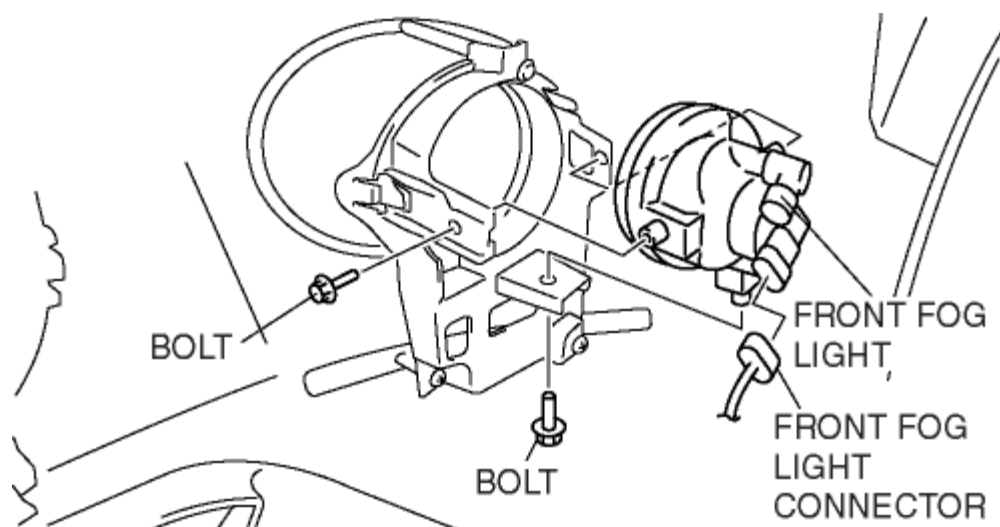
## 2008 - MX-5 - Body and Accessories

### FRONT FOG LIGHT REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the fasteners.



4. Slightly bent back the mudguard.
5. Disconnect the front fog light connector.



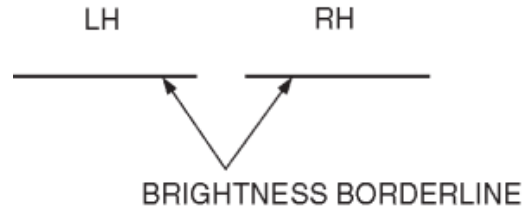
6. Remove the bolt, then remove the front fog light.
7. Install in the reverse order of removal.
8. Adjust the front fog light aiming. (See [FRONT FOG LIGHT AIMING.](#))



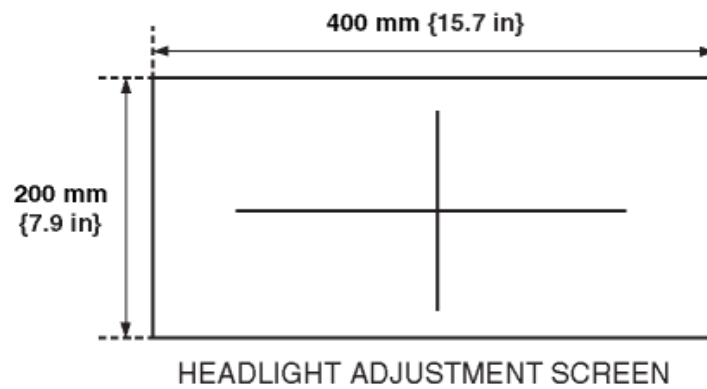
## 2008 - MX-5 - Body and Accessories

### FRONT FOG LIGHT AIMING

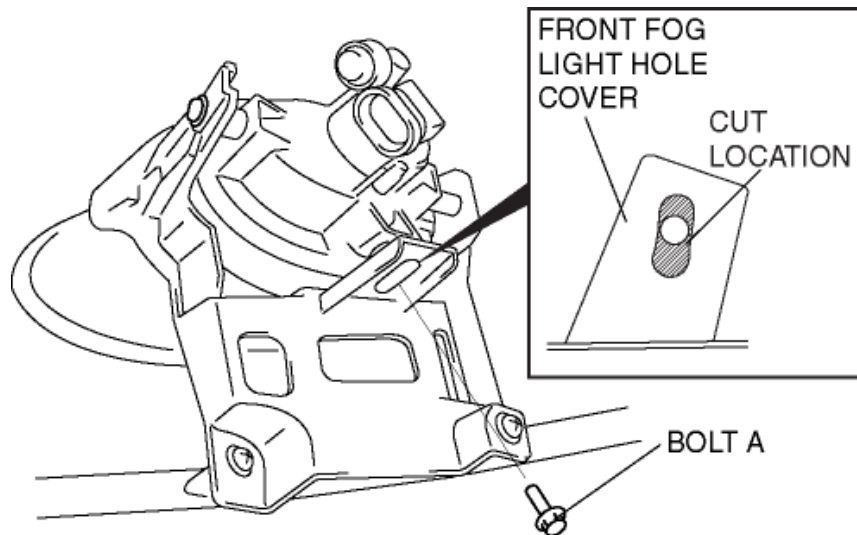
1. Point the headlight beams to a wall and verify that the headlight beams are as shown in the figure.



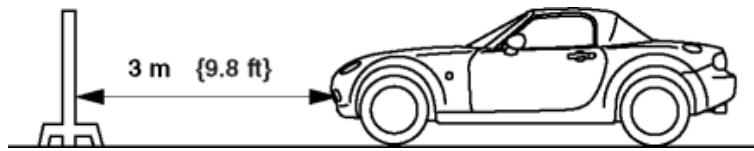
2. Make a headlight adjustment screen as shown in the figure using double-weight, white paper.



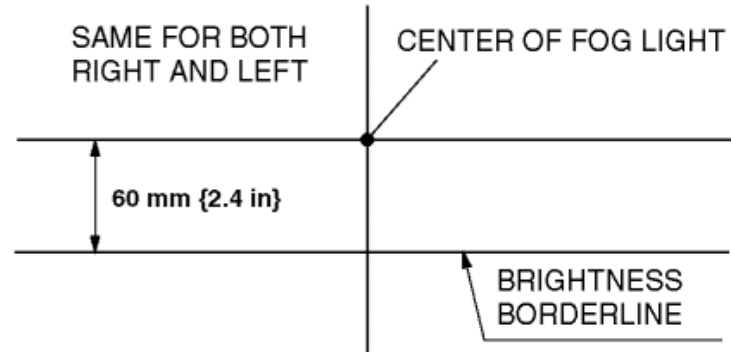
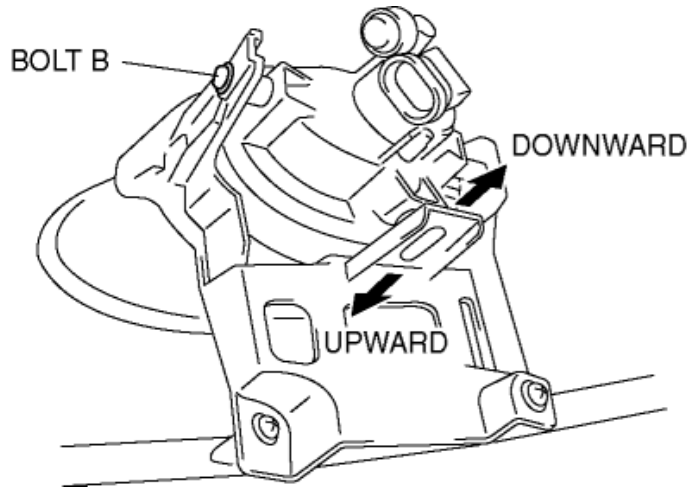
3. Remove the bolt A and cut the front fog light hole cover at the position shown in the figure.



4. Adjust the tire pressure to the specification.
5. Position the unloaded vehicle on a flat, level surface.
6. Seat one person in the driver's seat.
7. Line up the headlights with the white screen at a distance of **3 m {9.8 ft}** apart.



8. Place an object in front of the fog light not being adjusted to block its light beam.
9. Start the engine so that the battery remains charged.
10. Turn the front fog lights on.
11. Loosen the bolt B, move the front fog light in the direction of the arrows, and adjust the center of the front fog light to the position shown in the figure.



12. Install the bolt A and tighten the bolt B.

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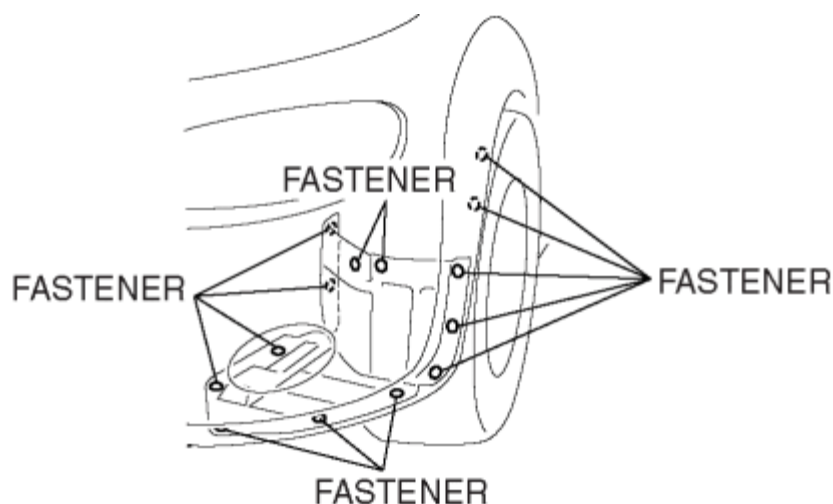
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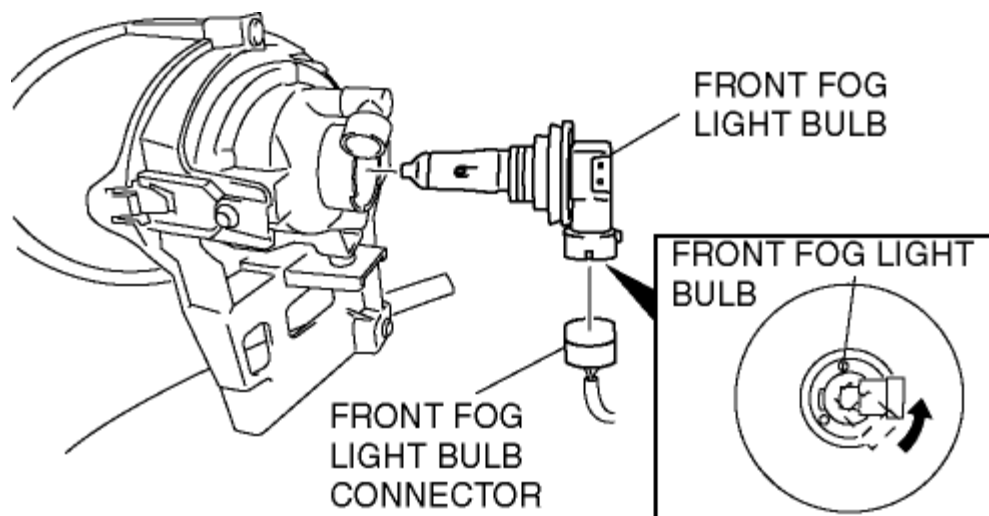
## 2008 - MX-5 - Body and Accessories

### FRONT FOG LIGHT BULB REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the fasteners.



4. Slightly bend back the mudguard.
5. Disconnect the front fog light bulb connector and remove the front fog light bulb by turning it in the direction of the arrow.



#### CAUTION:

- A halogen bulb generates extremely high heat when it is illuminated. If the surface of the bulb is soiled, excessive heat will build up and the life of the bulb will be shortened. When handling the bulb, hold the flange, not the glass. Wipe off any finger prints before installation.

6. Install in the reverse order of removal.

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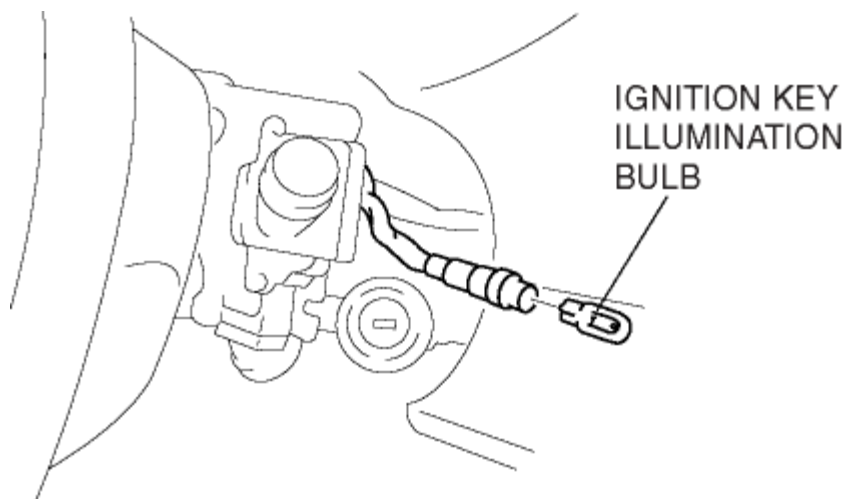
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## 2008 - MX-5 - Body and Accessories

### IGNITION KEY ILLUMINATION BULB REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the column cover. (See [COLUMN COVER REMOVAL/INSTALLATION.](#))
4. Remove the ignition key illumination bulb.



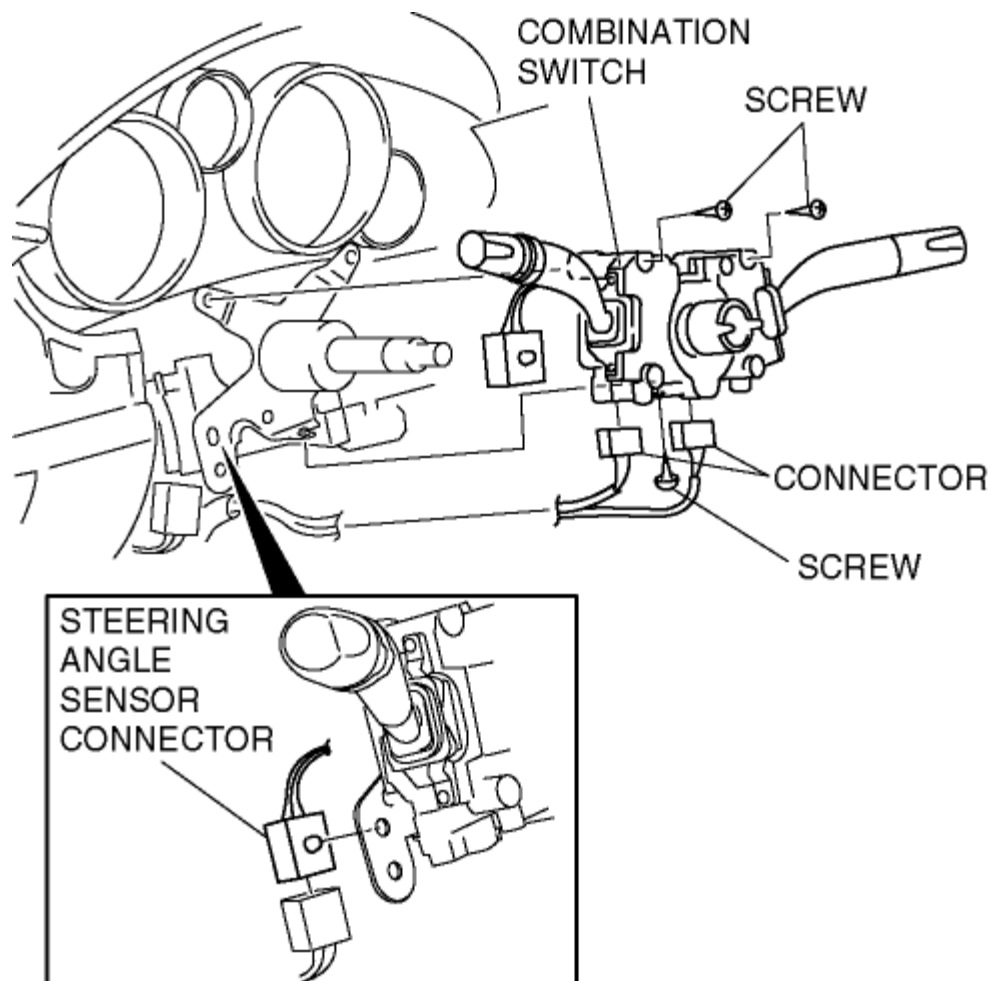
5. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### COMBINATION SWITCH REMOVAL/INSTALLATION

#### WARNING:

1. For vehicles with DSC, if the negative battery cable or the steering angle sensor connector or ROOM 15 A fuse is disconnected, the stored initial position of the steering angle sensor will be cleared and the DSC will not operate properly, making the vehicle unsafe to drive. Perform the steering angle sensor initialization procedure after connecting the negative battery cable.
1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the following parts:
  - a. Driver-side air bag module (See [DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION.](#))
  - b. Steering wheel (See [STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.](#))
  - c. Column cover (See [COLUMN COVER REMOVAL/INSTALLATION.](#))
  - d. Clock spring (See [CLOCK SPRING REMOVAL/INSTALLATION.](#))
4. Disconnect the connector.



5. Disconnect the steering angle sensor connector. (Vehicles with DSC)
6. Remove the screws and then remove the combination switch.
7. Install in the reverse order of removal.
8. Perform the steering angle sensor initialization procedure. (Vehicles with DSC)(See [STEERING ANGLE SENSOR INITIALIZATION PROCEDURE.](#))
9. If the steering angle sensor (combination switch body) is replaced, perform initialization of the DSC HU/CM steering angle signal. (See [STEERING ANGLE SIGNAL INITIALIZATION PROCEDURE.](#))

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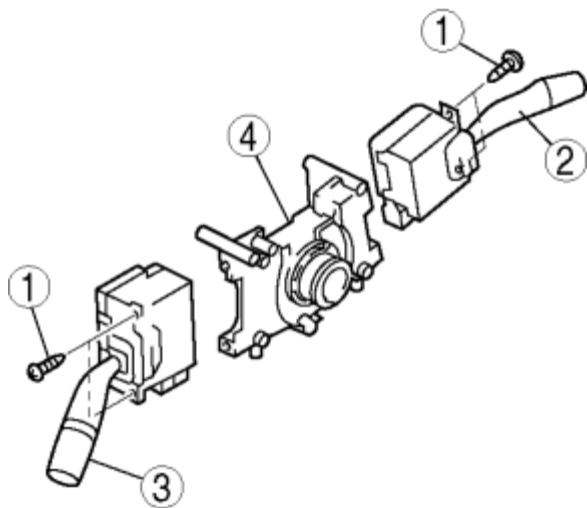
2008 - MX-5 - Body and Accessories

COMBINATION SWITCH DISASSEMBLY/ASSEMBLY

CAUTION:

- For vehicles with DSC: If the disc on the combination switch is deformed or has foreign material adhering to it, performance of the steering angle sensor may be reduced, causing abnormal operation. When handling the combination switch, be careful not to deform the disc and make sure there is no foreign material on it.

1. Disassemble in the order indicated in the table.



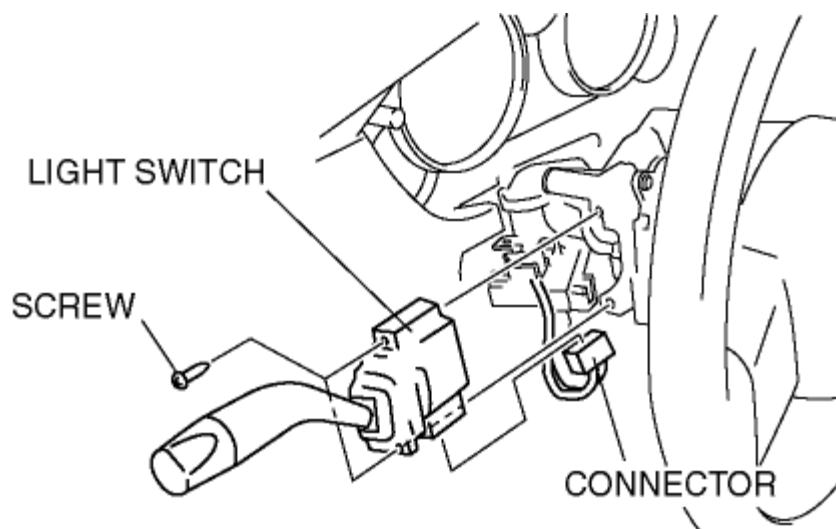
1	Screw
2	Wiper and washer switch
3	Light switch
4	Body

2. Assemble in the reverse order of disassembly.

## 2008 - MX-5 - Body and Accessories

### LIGHT SWITCH REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the column cover. (See [COLUMN COVER REMOVAL/INSTALLATION.](#))
4. Disconnect the connector.

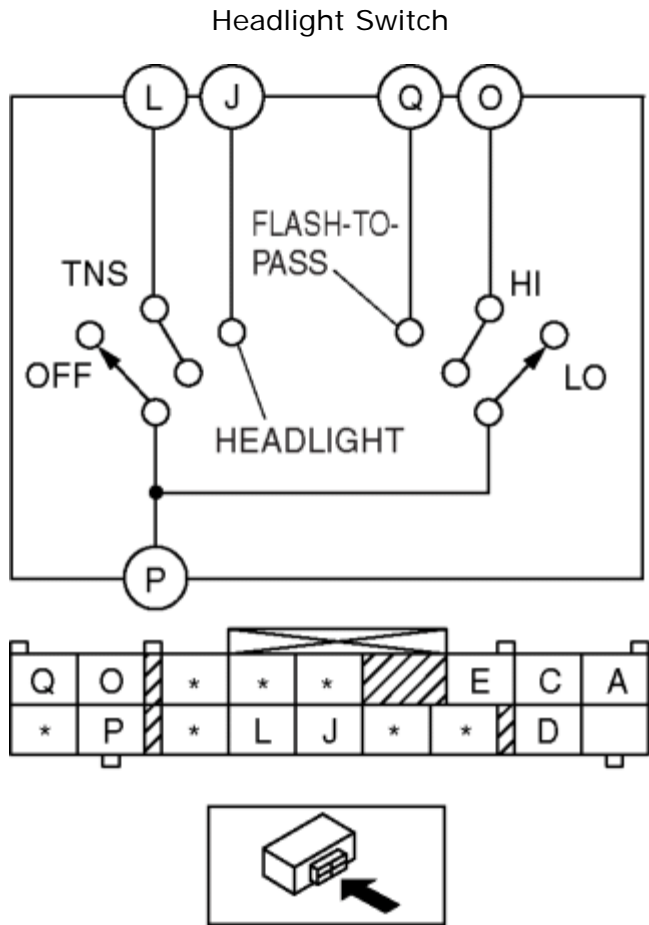


5. Remove the screws and then remove the light switch.
6. Install in the reverse order of removal.

2008 - MX-5 - Body and Accessories

LIGHT SWITCH INSPECTION

- 1. Verify that the continuity between the light switch terminals is as indicated in the table.

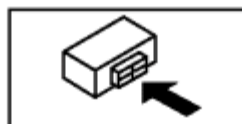
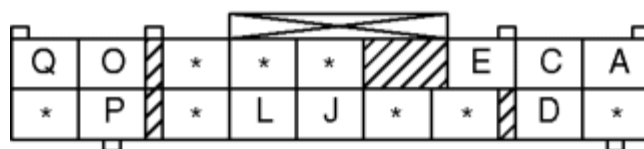
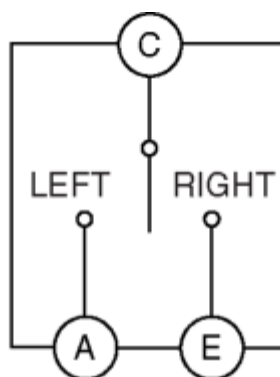


- If not as indicated in the table, replace the light switch.

○ — ○ : Continuity

Switch position			Terminal				
Light	Dimmer	Flash-to-pass	J	L	P	O	Q
OFF	-	OFF					
		ON			○ — ○ — ○		
TNS	-	OFF		○ — ○			
		ON		○ — ○ — ○ — ○			
Headlight	LO	OFF	○ — ○ — ○				
		ON	○ — ○ — ○ — ○ — ○				
	HI	-	○ — ○ — ○ — ○				

Turn Switch



○ — ○ : Continuity

Switch position	Terminal		
	A	C	E
Left	○ — ○		
OFF			
Right		○ — ○	

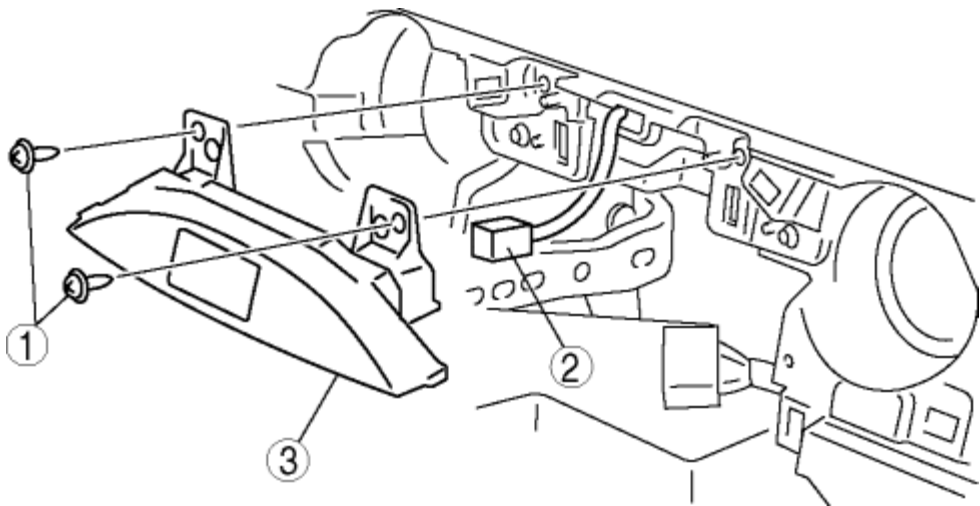




2008 - MX-5 - Body and Accessories

HAZARD WARNING SWITCH REMOVAL/INSTALLATION

- 1. Remove the battery cover.
- 2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
- 3. Remove the side wall. (See [SIDE WALL REMOVAL/INSTALLATION.](#))
- 4. Remove the center panel unit. (See [CENTER PANEL UNIT REMOVAL/INSTALLATION.](#))
- 5. Remove the glove compartment. (See [GLOVE COMPARTMENT REMOVAL/INSTALLATION.](#))
- 6. Remove the decoration panel (passenger's side). (See [DECORATION PANEL REMOVAL/INSTALLATION.](#))
- 7. Remove in the order indicated in the table.



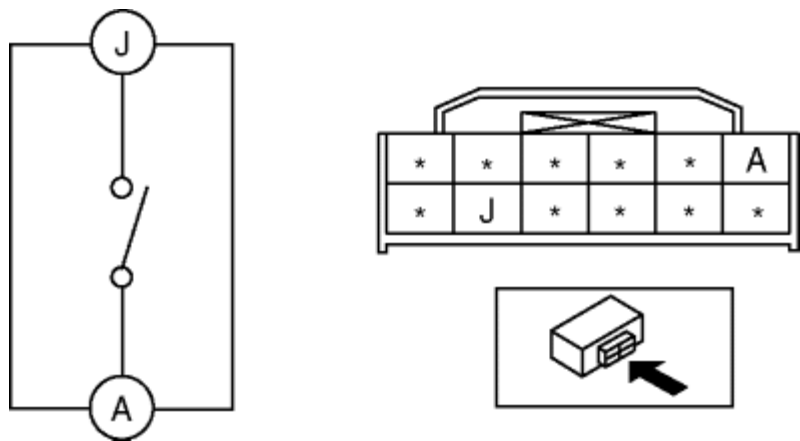
1	Screw
2	Hazard warning switch connector
3	Hazard warning switch

- 8. Install in the reverse order of removal.

2008 - MX-5 - Body and Accessories

HAZARD WARNING SWITCH INSPECTION

1. Verify that the continuity between the hazard switch terminals is as indicated in the table.



- If not as indicated in the table, replace the hazard warning switch.

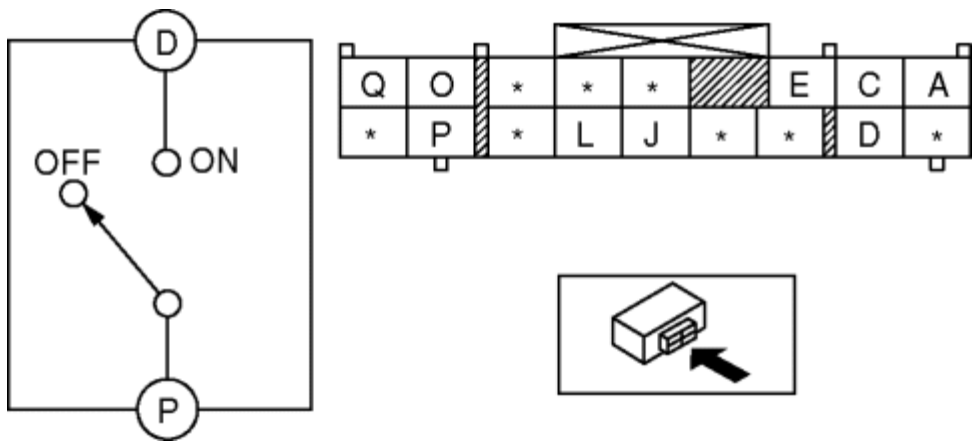
○ — ○ : Continuity

Switch position	Terminal	
	J	A
OFF		
ON	○ — ○	

2008 - MX-5 - Body and Accessories

FRONT FOG LIGHT SWITCH INSPECTION

1. Verify that the continuity between the front fog light switch terminals is as indicated in the table.



- If not as indicated in the table, replace the light switch.

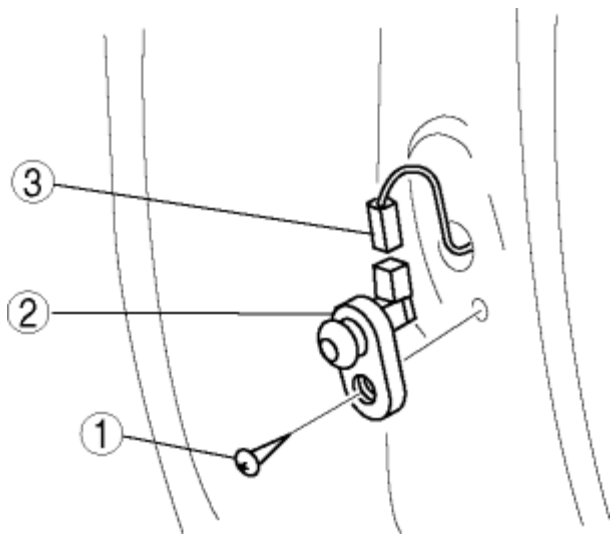
○ — ○ : Continuity

Switch position		Terminal	
Light	Front fog light switch	D	P
OFF	OFF		
	ON	○ — ○	○ — ○
TNS	ON	○ — ○	○ — ○
Head light	ON	○ — ○	○ — ○

## 2008 - MX-5 - Body and Accessories

### DOOR SWITCH REMOVAL/INSTALLATION

- 1. Remove the battery cover.
- 2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
- 3. Disassemble in the order indicated in the table.



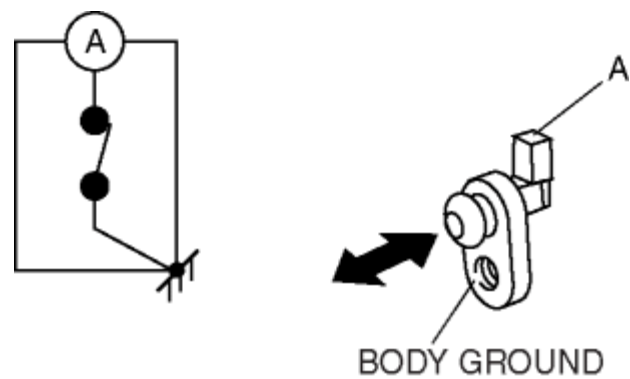
1	Screw
2	Door switch
3	connector

- 4. Install in the reverse order of removal.

2008 - MX-5 - Body and Accessories

DOOR SWITCH INSPECTION

- 1. Remove the door switch.(See [DOOR SWITCH REMOVAL/INSTALLATION.](#))
- 2. Verify that the continuity between door switch terminal and the body ground is as indicated in the table.



- If not as indicated in the table, replace the door switch.

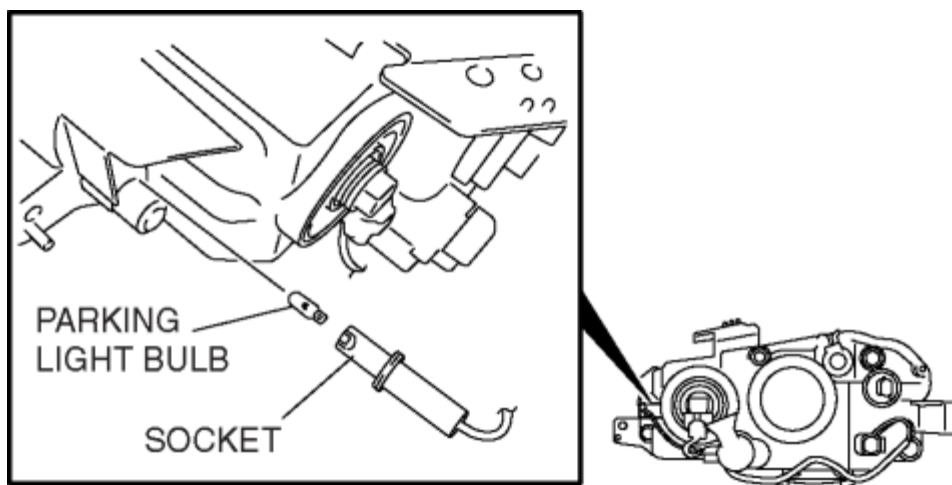
○ — ○ : Continuity

Switch position	Terminal	
	A	Body ground
Door switch pressed		
Door switch released	○ — ○	○ — ○

## 2008 - MX-5 - Body and Accessories

### PARKING LIGHT BULB REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Disconnect the connector.



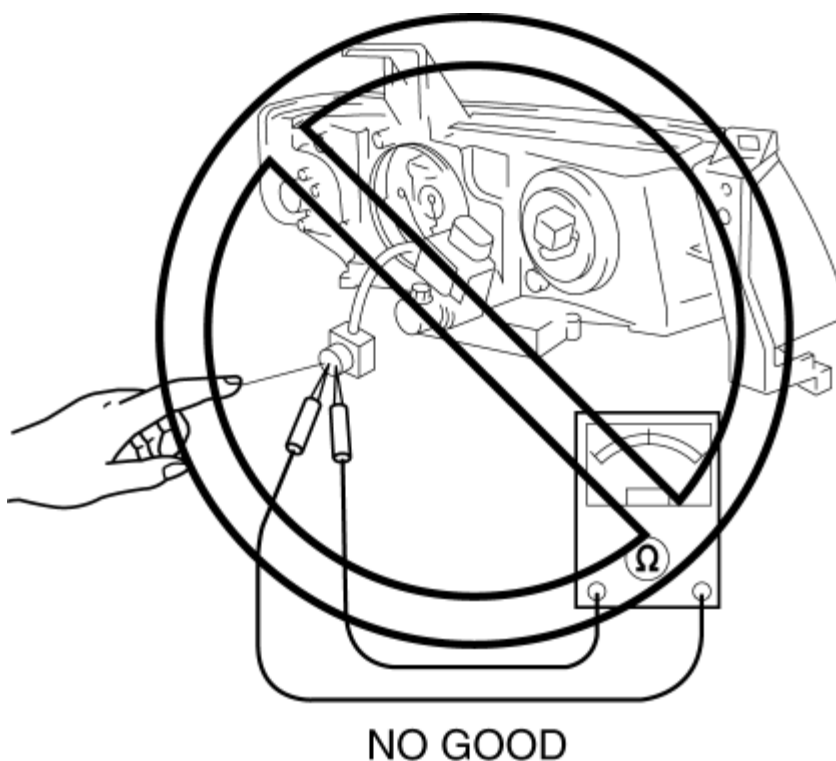
4. Remove the socket, then remove the parking light bulb.
5. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### DISCHARGE HEADLIGHT SERVICE WARNINGS

#### Discharge Headlight Bulb Service Warnings

- To prevent electrical shock when replacing the discharge headlight bulb, dry hands thoroughly, and perform the work in an area out of rain.
- When the light switch is on, approx. 25,000 V of high voltage passes through the discharge headlight bulb socket. Because of the danger of electrical shock, do not insert fingers or a tester.



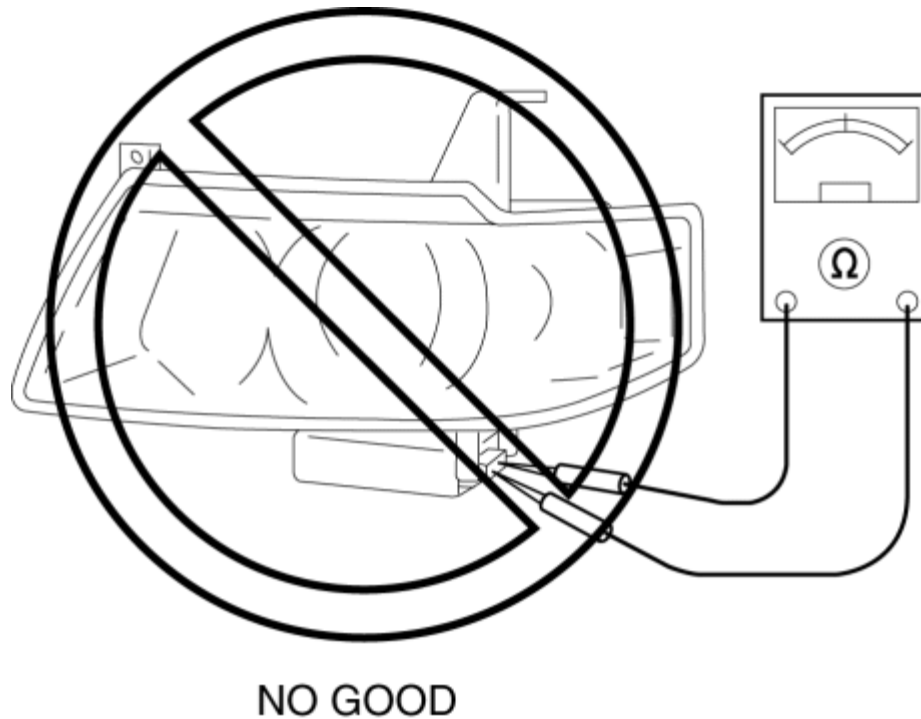
- When the headlights are on, high voltage flows around the socket and bulb. When turning on the discharge headlights while working, always leave the headlights in the vehicle-installed condition to prevent electrical shock.

#### Discharge Headlight Bulb Removal Caution

- If the headlights are turned on (light switch is in HEAD or AUTO position) with a discharge headlight bulb removed, it could cause a fire. Do not turn on the headlights with a discharge headlight bulb removed.

## Discharge Headlight Control Module Service Warnings

- Because of the danger of electrical shock, when inspecting with a tester, do not inspect the discharge headlight control module as a single unit or disassemble it.



## Discharge Headlight Control Module Reuse

- If the discharge headlight control module is dented or damaged in any way, replace the module with a new one to prevent electrical shock and improper operation.
- Although the control module may temporarily operate normally even though it has received an impact, it is possible that the interior may have been damaged. When reusing the control module, inspect the following items regarding discharge headlight illumination to verify that there are no malfunctions.
  - Verify that the discharge headlights illuminate normally by testing them several times under cold illumination (headlights off for approx. 10 min or more and then turned on) and hot illumination (headlights on for approx. 15 min or more, turned off for approx. 1 min, and then turned on again) conditions.
  - Inspect the headlight illumination in the period from directly after cold illumination until they are uniformly illuminated (approx. 5 min) and verify that there is no flickering or inconsistent brightness.
  - Turn on the headlights for approx. 30 min with normal condition bulbs and verify that there is no brightness difference between the right and left, and that illumination is consistent.

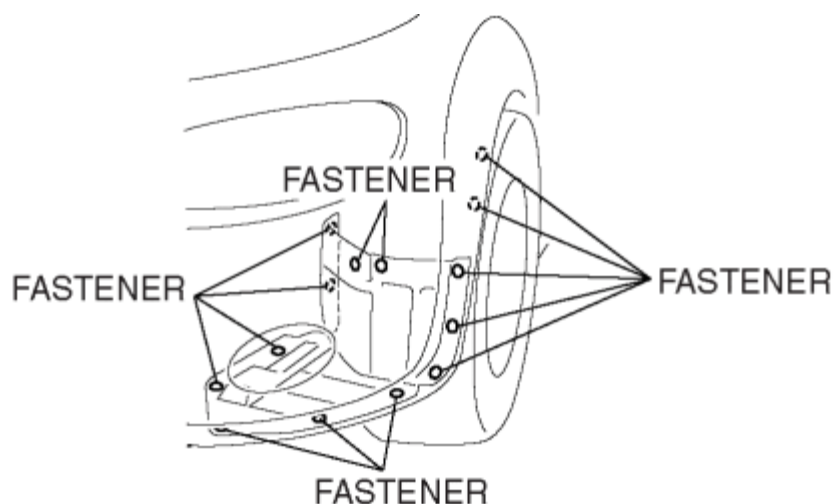




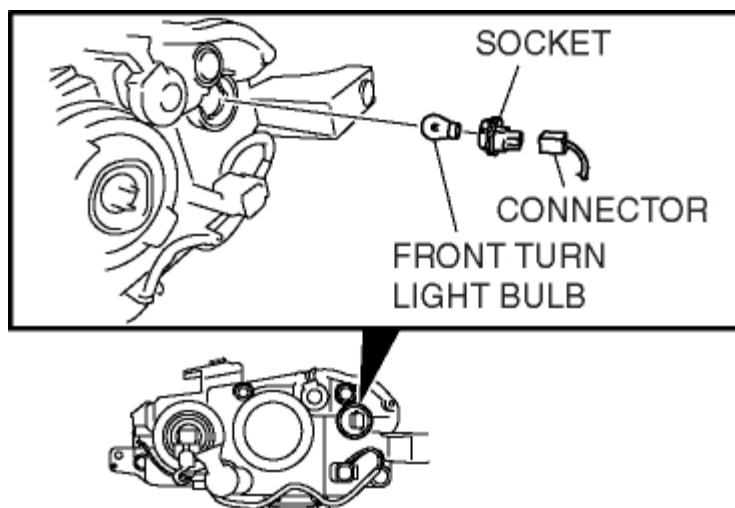
## 2008 - MX-5 - Body and Accessories

### FRONT TURN LIGHT BULB REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the fasteners.



4. Slightly bent back the mudguard.
5. Disconnect the connector.



6. Remove the socket, then remove the front turn light bulb.
7. Install in the reverse order of removal.



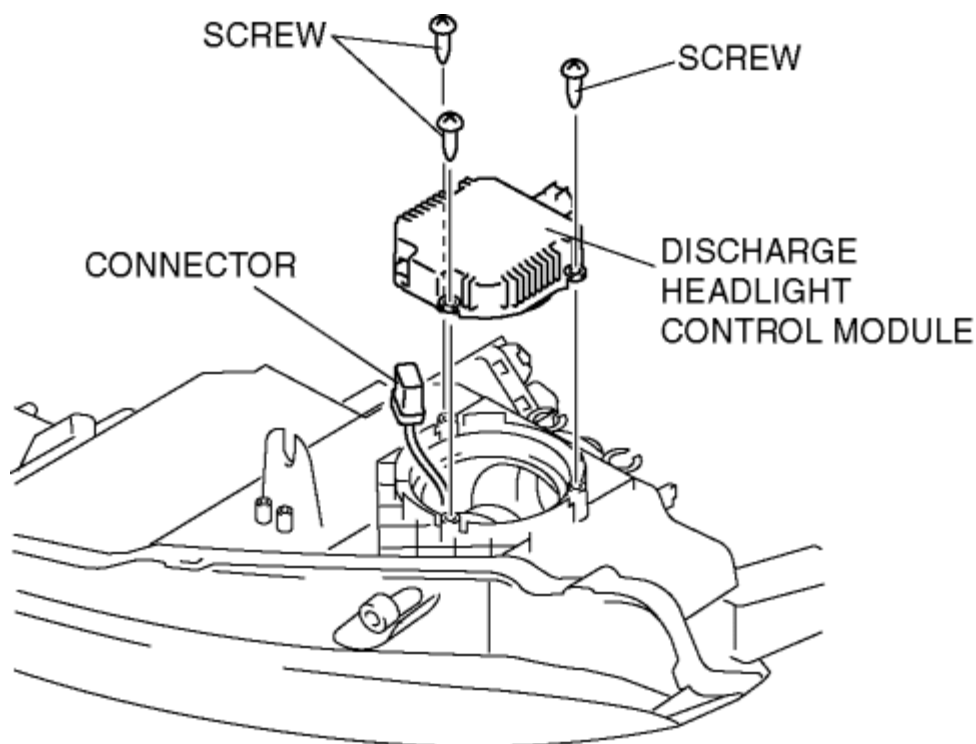
## 2008 - MX-5 - Body and Accessories

### DISCHARGE HEADLIGHT CONTROL MODULE REMOVAL/INSTALLATION

#### WARNING:

- Incorrect servicing of the discharge headlights could result in electrical shock. Before servicing the discharge headlights, always refer to the discharge headlight service warnings. (See [DISCHARGE HEADLIGHT SERVICE WARNINGS](#).)

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the front bumper. (See [FRONT BUMPER REMOVAL/INSTALLATION](#).)
4. Remove the front combination light. (See [FRONT COMBINATION LIGHT REMOVAL/INSTALLATION](#).)
5. Remove screws.



6. Disconnect the connector.
7. Remove the discharge headlight control module.
8. Install in the reverse order of removal.



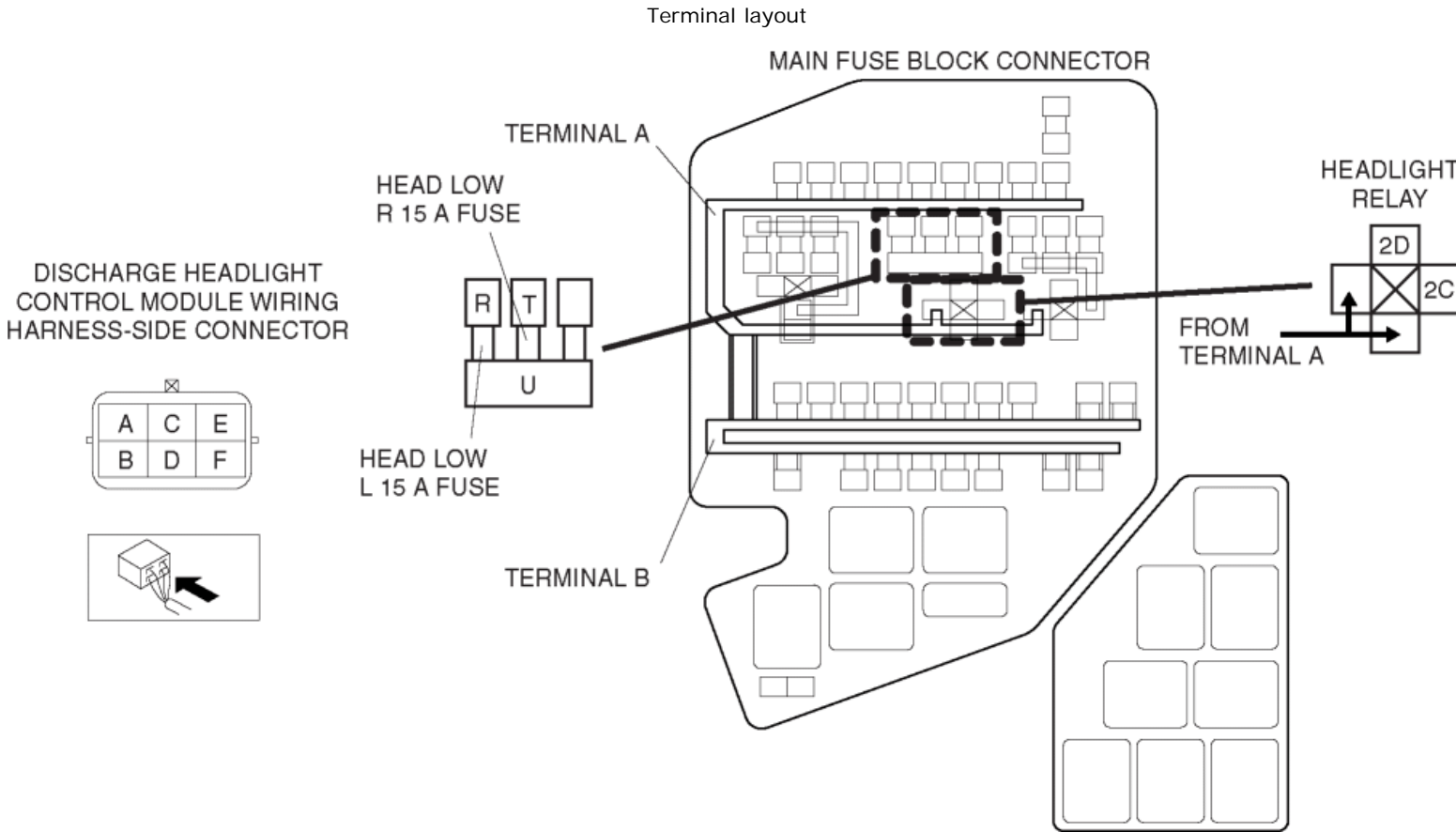
2008 - MX-5 - Body and Accessories

DISCHARGE HEADLIGHT SYSTEM INSPECTION

Discharge headlight inoperative

WARNING:

- Incorrect servicing of the discharge headlights could result in electrical shock. Before servicing the discharge headlights, always refer to the discharge headlight service warnings. (See [DISCHARGE HEADLIGHT SERVICE WARNINGS.](#))



Inspection procedure

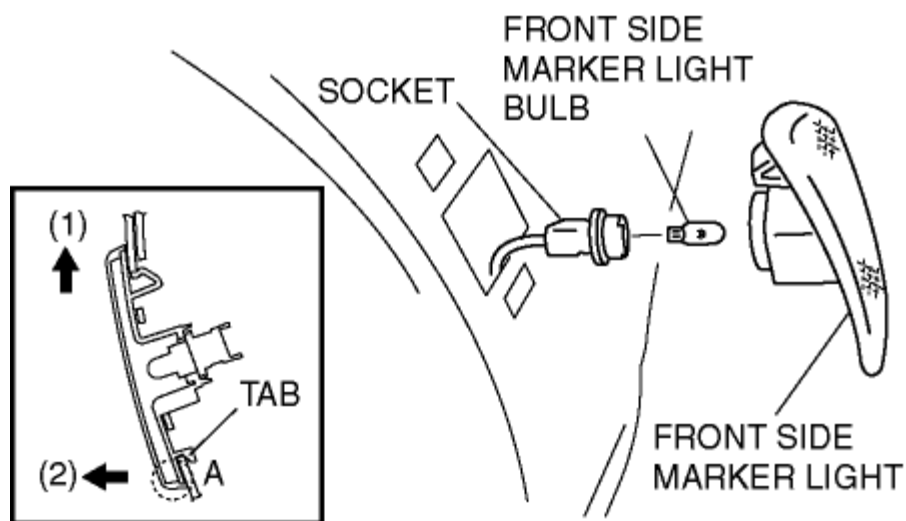
STEP	INSPECTION	ACTION
1	<b>INSPECT POWER SUPPLY CIRCUIT OF DISCHARGE HEADLIGHT CONTROL MODULE</b> <ul style="list-style-type: none"><li>• Disconnect the discharge headlight control module connector.</li><li>• Turn the headlight switch to the HEADLIGHT (LO) position.</li><li>• Measure the voltage at discharge headlight control module terminal C (wiring harness-side).</li><li>• Is the voltage <b>approx. 12 V</b>?</li></ul>	YesGo to Step 6.
		NoGo to the next step.
2	<b>INSPECT FUSE</b> <ul style="list-style-type: none"><li>• Turn the headlight switch to the OFF position.</li><li>• Remove the HEAD LOW R 15 A fuse (RH) or HEAD LOW L 15 A fuse (LH).</li></ul>	YesGo to the next step.
		NoReplace the fuse.

	<ul style="list-style-type: none"> <li>Inspect the fuses.</li> <li>Are the fuses normal?</li> </ul>		
3	<b>INSPECT HEADLIGHT RELAY</b> <ul style="list-style-type: none"> <li>Remove the headlight relay. (See <a href="#">RELAY LOCATION.</a>)</li> <li>Inspect the headlight relay. (See <a href="#">RELAY INSPECTION.</a>)</li> <li>Is the headlight relay normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the headlight relay. (See <a href="#">RELAY LOCATION.</a> )
4	<b>INSPECT LIGHT SWITCH</b> <ul style="list-style-type: none"> <li>Inspect the light switch. (See <a href="#">LIGHT SWITCH INSPECTION.</a>)</li> <li>Is the light switch normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the light switch. (See <a href="#">LIGHT SWITCH REMOVAL/INSTALLATION.</a> )
5	<b>INSPECT WIRING HARNESS BETWEEN BATTERY AND DISCHARGE HEADLIGHT CONTROL MODULE</b> <ul style="list-style-type: none"> <li>Remove the battery cover.</li> <li>Disconnect the negative battery cable. (See <a href="#">BATTERY REMOVAL/INSTALLATION [LF].</a>)</li> <li>Inspect for continuity between the following terminals: <ul style="list-style-type: none"> <li>Battery (positive terminal) and headlight relay (main fuse block terminal A)</li> <li>Headlight relay terminal 2C and HEAD LOW R 15 A fuse (RH) terminal U</li> <li>Headlight relay terminal 2C and HEAD LOW L 15 A fuse (LH) terminal U</li> <li>HEAD LOW R 15 A fuse (RH) terminal T and discharge headlight control module terminal C</li> <li>HEAD LOW L 15 A fuse (LH) terminal R and discharge headlight control module terminal C</li> </ul> </li> <li>Are the wiring harnesses normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the related wiring harness.
6	<b>INSPECT WIRING HARNESS BETWEEN DISCHARGE HEADLIGHT CONTROL MODULE AND GROUND</b> <ul style="list-style-type: none"> <li>Inspect wiring harness between discharge headlight control module terminal F and ground for following: <ul style="list-style-type: none"> <li>Short to power supply</li> <li>Open circuit</li> </ul> </li> <li>Is the wiring harness normal?</li> </ul>	Yes	Go to the next step.
		No	Replace the related wiring harness.
7	<b>VERIFY WHETHER MALFUNCTION IS IN DISCHARGE HEADLIGHT BULB OR DISCHARGE HEADLIGHT CONTROL MODULE</b> <ul style="list-style-type: none"> <li>Install the discharge headlight low bulb (previously verified as illuminating normally). (See <a href="#">HEADLIGHT BULB REMOVAL/INSTALLATION.</a>)</li> <li>Connect the discharge headlight control module connector.</li> <li>Turn the headlight switch to the HEADLIGHT (LO) position.</li> <li>Does the headlight (low-beam) illuminate?</li> </ul>	Yes	System inspection completed.
		No	Replace the front combination light. (See <a href="#">FRONT COMBINATION LIGHT REMOVAL/INSTALLATION.</a> )

## 2008 - MX-5 - Body and Accessories

### FRONT SIDE MARKER LIGHT REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Move the front side marker light in the direction of the arrow (1) and detach the tab.



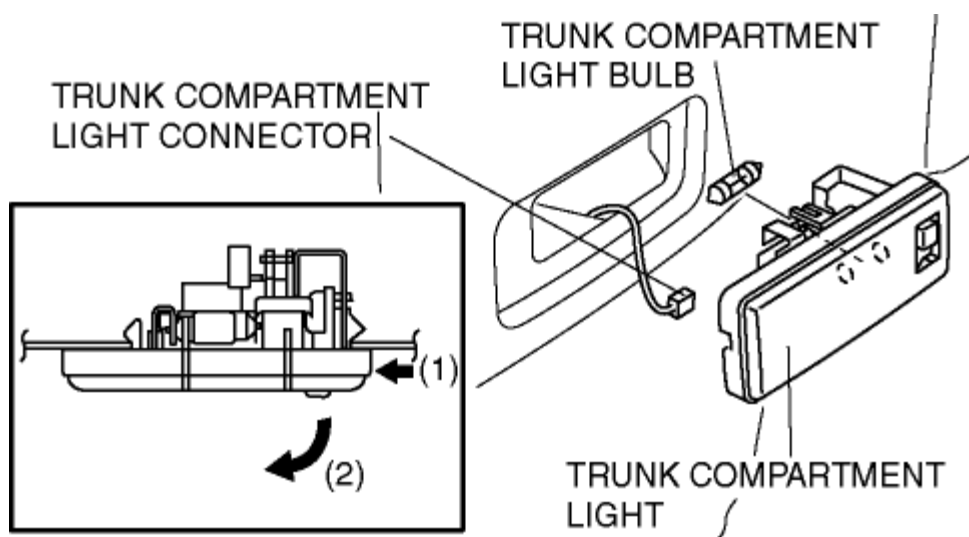
4. Pull area A of the front side marker light in the direction of arrow (2) and remove the front side marker light.
5. Detach the socket and remove the front side marker light bulb.
6. Install in the reverse order of removal.



## 2008 - MX-5 - Body and Accessories

### TRUNK COMPARTMENT LIGHT REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the trunk compartment light.

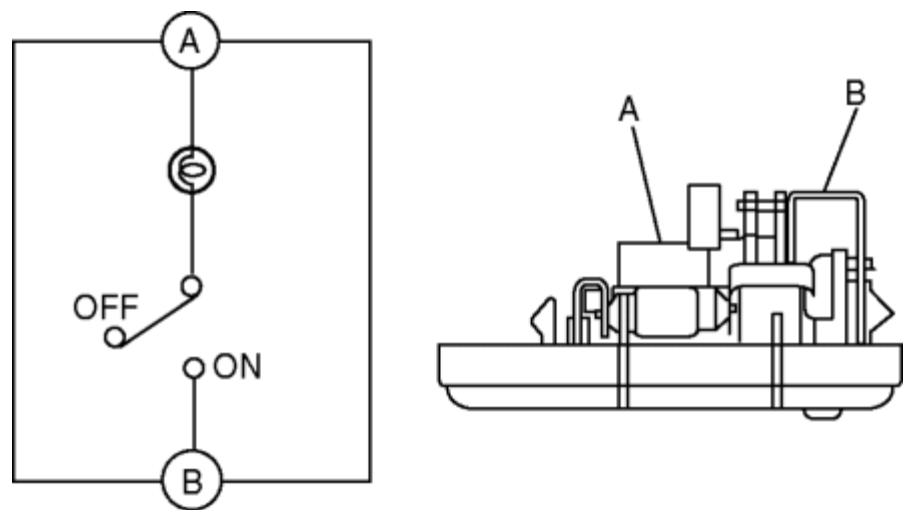


4. Disconnect the trunk compartment light connector.
5. Remove the trunk compartment light bulb.
6. Install in the reverse order of removal.

2008 - MX-5 - Body and Accessories

TRUNK COMPARTMENT LIGHT INSPECTION

1. Verify that the continuity between the trunk compartment light terminals is as indicated in the table.



- If not as indicated in the table, replace the trunk compartment light.

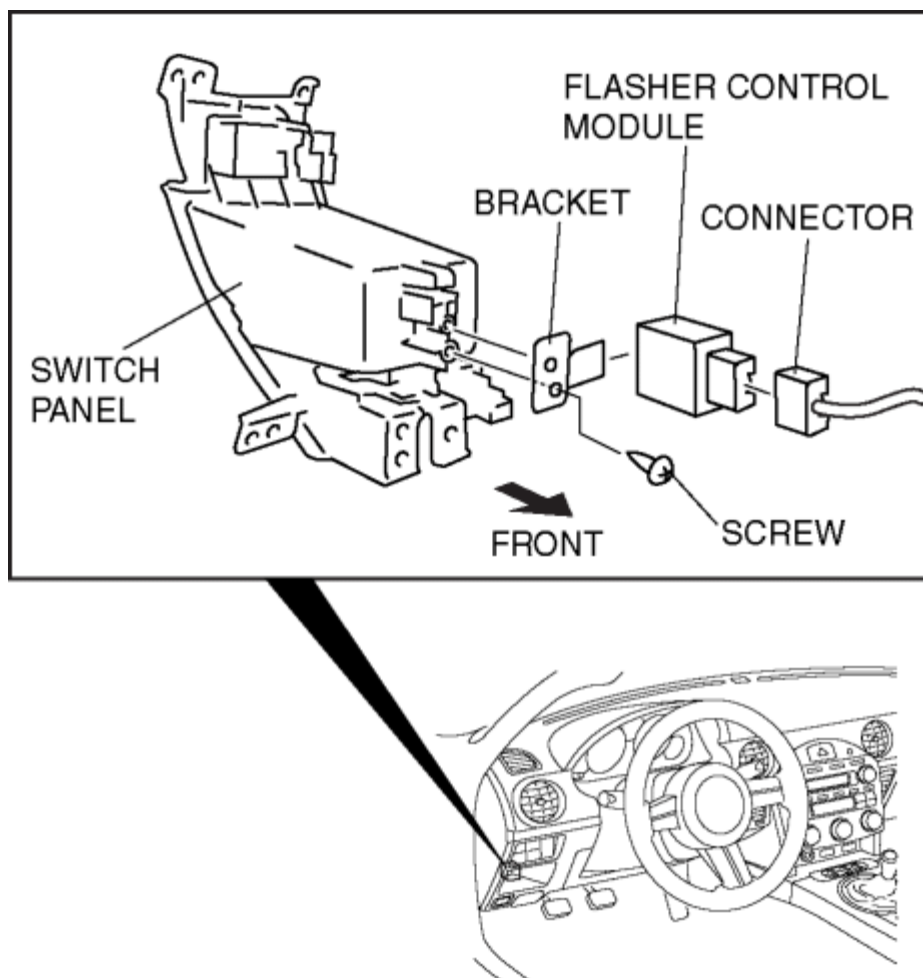
○ — ○ : Bulb

Switch position	Terminal	
	A	B
ON	○ — ○ — ○	
OFF		

## 2008 - MX-5 - Body and Accessories

### FLASHER CONTROL MODULE REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Disconnect the connector.



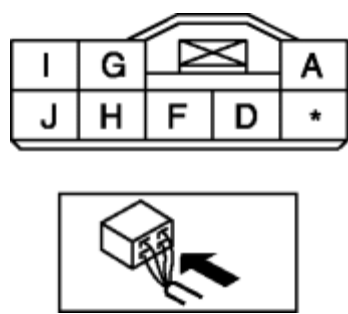
4. Remove the screw and then remove the flasher control module.
5. Install in the reverse order of removal.

2008 - MX-5 - Body and Accessories

FLASHER CONTROL MODULE INSPECTION

1. Remove the flasher control module with the connector still connected.
2. Measure the voltage at each terminal.
  - If the voltage is not as specified in the Terminal Voltage Table (Reference), inspect the parts under "Inspection item(s)".
  - If there is any malfunction, inspect the parts under "Inspection item(s)".
    - If the system does not work properly even though the parts or related wiring harnesses do not have any malfunction, replace the flasher control module.

Terminal Voltage Table (Reference)



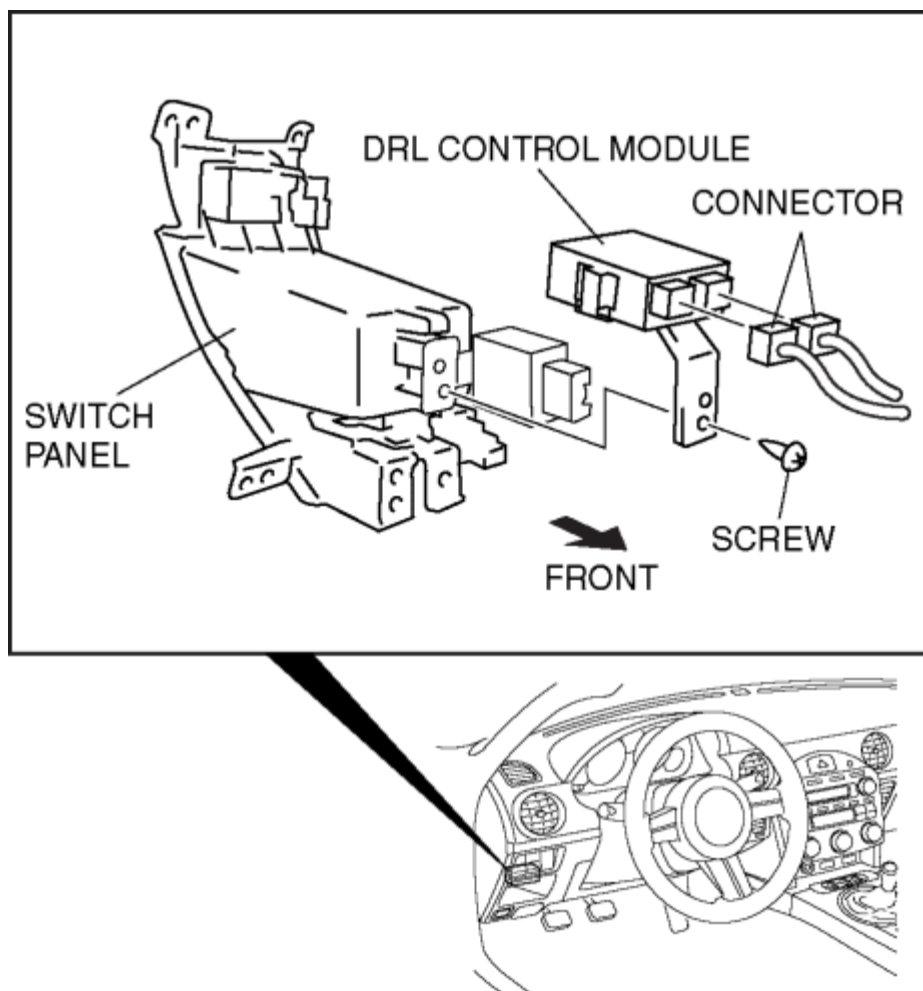
Terminal	Signal name	Connected to	Measured condition		Voltage (V)	Inspection item(s)
A	Power supply	HAZARD 10 A fuse	Under any condition		B+	<ul style="list-style-type: none"><li>• HAZARD 10 A fuse</li><li>• Related wiring harnesses</li></ul>
D	Flasher control module output	Turn light (LH)	Turn light switch (LH) is on.	Turn light (LH) flashes.	Alternates between 1.0 or less and B+	<ul style="list-style-type: none"><li>• Turn light (LH)</li><li>• Related wiring harnesses</li></ul>
			Hazard warning switch is on.			

			Except above		1.0 or less	
F	GND	Body ground	Under any condition		1.0 or less	<ul style="list-style-type: none"><li>GND</li></ul>
G	Flasher control module output	Turn light (RH)	Turn light switch (RH) is on.	Turn light (RH) flashes.	Alternates between 1.0 or less and B+	<ul style="list-style-type: none"><li>Turn light (RH)</li><li>Related wiring harnesses</li></ul>
			Hazard warning switch is on.			
			Except above		1.0 or less	
H	Hazard warning switch input	Hazard warning switch	Hazard warning switch is on.		1.0 or less	<ul style="list-style-type: none"><li>Hazard warning switch</li></ul> <p>(See <b>HAZARD WARNING SWITCH INSPECTION.</b>)</p> <ul style="list-style-type: none"><li>Related wiring harnesses</li></ul>
			Hazard warning switch is off.		B+	
I	Turn switch (RH) input	Turn switch	Turn the ignition switch to the ON position.	Turn switch (RH) is on.	B+	<ul style="list-style-type: none"><li>Turn switch</li></ul> <p>(See <b>LIGHT SWITCH INSPECTION.</b>)</p> <ul style="list-style-type: none"><li>Related wiring harnesses</li></ul>
			Except above		1.0 or less	
J	Turn switch (LH) input	Turn switch	Turn the ignition switch to the ON position.	Turn switch (LH) is on.	B+	<ul style="list-style-type: none"><li>Turn switch</li></ul> <p>(See <b>LIGHT SWITCH INSPECTION.</b>)</p> <ul style="list-style-type: none"><li>Related wiring harnesses</li></ul>
			Except above		1.0 or less	

## 2008 - MX-5 - Body and Accessories

### DRL CONTROL MODULE REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Disconnect the connectors.



4. Remove the screw and then remove the DRL control module.
5. Install in the reverse order of removal.

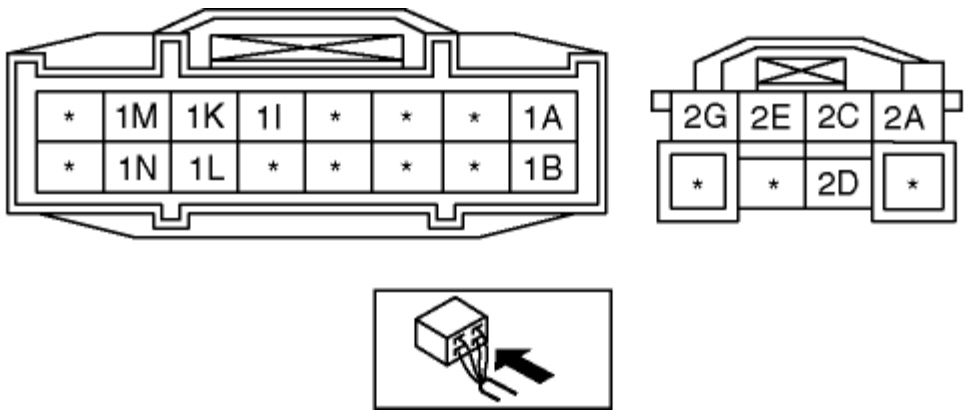
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DRL CONTROL MODULE INSPECTION

1. Connect the connector to the DRL control module.
2. Connect the negative battery cable.
3. Measure the voltage at the DRL control module using voltmeter.
- If the value are not as specified in the Terminal Voltage List (Reference), inspect the parts under "Inspection item(s)" and related wiring harnesses.

• If the system does not work properly even though the parts or related wiring harnesses do not have any malfunction, replace the DRL control module.

Terminal Voltage Table (Reference)



Terminal	Signal name	Connected to	Test condition	Voltage (V)	Inspection item(s)
1A	Power supply	DRL 15 A fuse	Under any condition	B+	<div><div>• DRL 15 A fuse</div><div>• Related wiring harness</div></div>
1B	Parking brake lever pulled/released	Parking brake switch	Parking brake lever pulled	1.0 or less	<div><div>• Parking brake switch</div><div>(See<b>PARKING BRAKE SWITCH INSPECTION.</b>)</div></div>
			Parking brake lever released	B+	

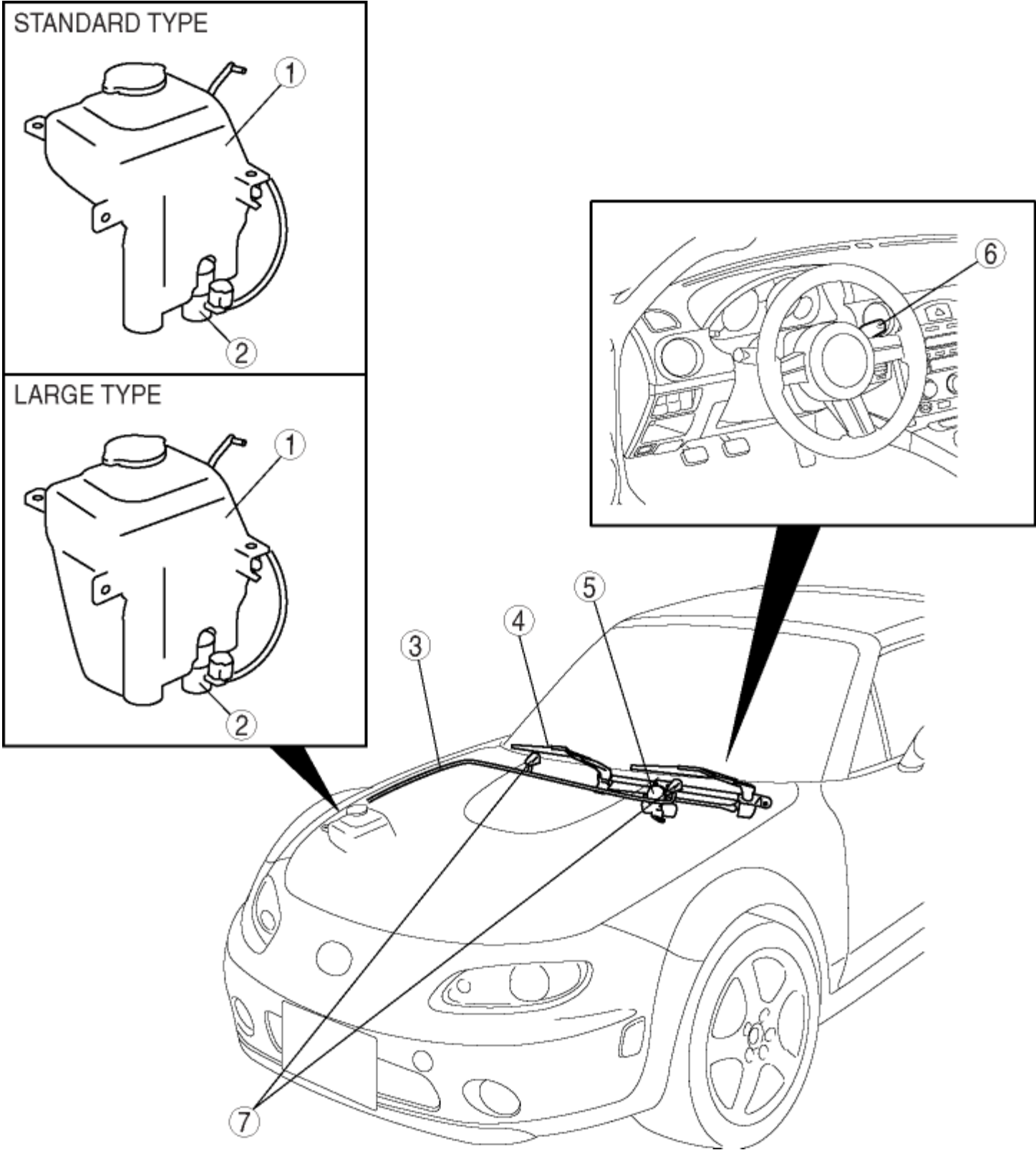
						<ul style="list-style-type: none"><li>• Related wiring harness</li></ul>
1I	IG1	METER 15 A fuse	Turn the ignition switch to the ON position.		B+	<ul style="list-style-type: none"><li>• METER 15 A fuse</li><li>• Ignition switch</li><li>(See<b>IGNITION SWITCH INSPECTION.</b>)</li><li>• Related wiring harness</li></ul>
			Turn the ignition switch to the LOCK position.		1.0 or less	
1K	High-beam on/off	Light switch	Turn the ignition switch to the ON position.	Dimmer switch at HI	1.0 or less	<ul style="list-style-type: none"><li>• Light switch</li><li>(See<b>LIGHT SWITCH INSPECTION.</b>)</li><li>• Related wiring harness</li></ul>
				Dimmer switch at LO	B+	
1L	Front fog light switch ON/OFF	Front fog light switch	Light switch at 2nd position	Front fog light switch is on.	1.0 or less	<ul style="list-style-type: none"><li>• Light switch</li><li>(See<b>LIGHT SWITCH INSPECTION.</b>)</li><li>• Related wiring harness</li></ul>
				Front fog light switch is off.	B+	
1M	Flash-to-pass	Light switch	Turn the ignition switch to the ON position.	Flash-to-pass activated.	1.0 or less	<ul style="list-style-type: none"><li>• Light switch</li><li>(See<b>LIGHT SWITCH INSPECTION.</b>)</li><li>• Related wiring harness</li></ul>
				Flash-to-pass not activated.	B+	
1N	Front fog light relay operation	Front fog light relay	Light switch at 2nd position and dimmer switch at LO	Front fog light switch is on.	1.0 or less	<ul style="list-style-type: none"><li>• FOG 15 A fuse</li><li>• Front fog light relay</li><li>(See<b>RELAY INSPECTION.</b>)</li><li>• Related wiring harness</li></ul>
				Front fog light switch is off.	B+	
				Dimmer		



2A	Headlight (RH) operation (high-beam)	Headlight (high-beam)	Light switch at 2nd position	switch at LO	1.0 or less	<ul style="list-style-type: none"> <li>Headlight (RH)</li> <li>Related wiring harness</li> </ul>
				Dimmer switch at HI	1.0 or less	
2C	Headlight (LH) operation (high-beam)	Headlight (high-beam)	Light switch at 2nd position	Dimmer switch at LO	1.0 or less	<ul style="list-style-type: none"> <li>Headlight (LH)</li> <li>Related wiring harness</li> </ul>
				Dimmer switch at HI	B+	
2D	Ground	GND	Under any condition		1.0 or less	GND
2E	Headlight (RH) operation (high-beam)	Headlight (high-beam)	Light switch at 2nd position	Dimmer switch at LO	1.0 or less	<ul style="list-style-type: none"> <li>Headlight (RH)</li> <li>Related wiring harness</li> </ul>
				Dimmer switch at HI	B+	
2G	Power supply	DRL 15 A fuse	Under any condition		B+	<ul style="list-style-type: none"> <li>DRL 15 A fuse</li> <li>Related wiring harness</li> </ul>

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WIPER/WASHER SYSTEM LOCATION INDEX



1	Washer tank (See <a href="#">WASHER TANK REMOVAL/INSTALLATION.</a> )
2	Washer motor (See <a href="#">WASHER MOTOR REMOVAL/INSTALLATION.</a> ) (See <a href="#">WASHER MOTOR INSPECTION.</a> )
3	Washer hose (See <a href="#">WASHER HOSE REMOVAL/INSTALLATION.</a> )
4	Wiper arm and blade (See <a href="#">WIPER ARM AND BLADE REMOVAL/INSTALLATION.</a> ) (See <a href="#">WIPER ARM AND BLADE ADJUSTMENT.</a> )
5	Wiper motor (See <a href="#">WIPER MOTOR REMOVAL/INSTALLATION.</a> ) (See <a href="#">WIPER MOTOR DISASSEMBLY/ASSEMBLY.</a> ) (See <a href="#">WIPER MOTOR INSPECTION.</a> )
6	Wiper and washer switch (See <a href="#">WIPER AND WASHER SWITCH REMOVAL/INSTALLATION.</a> ) (See <a href="#">WIPER AND WASHER SWITCH INSPECTION.</a> )
7	Washer nozzle (See <a href="#">WASHER NOZZLE REMOVAL/INSTALLATION.</a> )

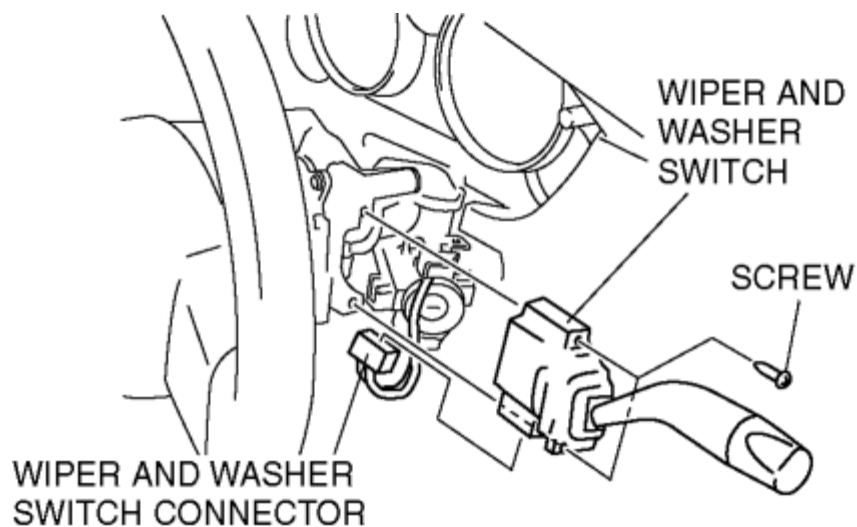
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## 2008 - MX-5 - Body and Accessories

### WIPER AND WASHER SWITCH REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the column cover. (See [COLUMN COVER REMOVAL/INSTALLATION.](#))
4. Disconnect the wiper and washer switch connector.

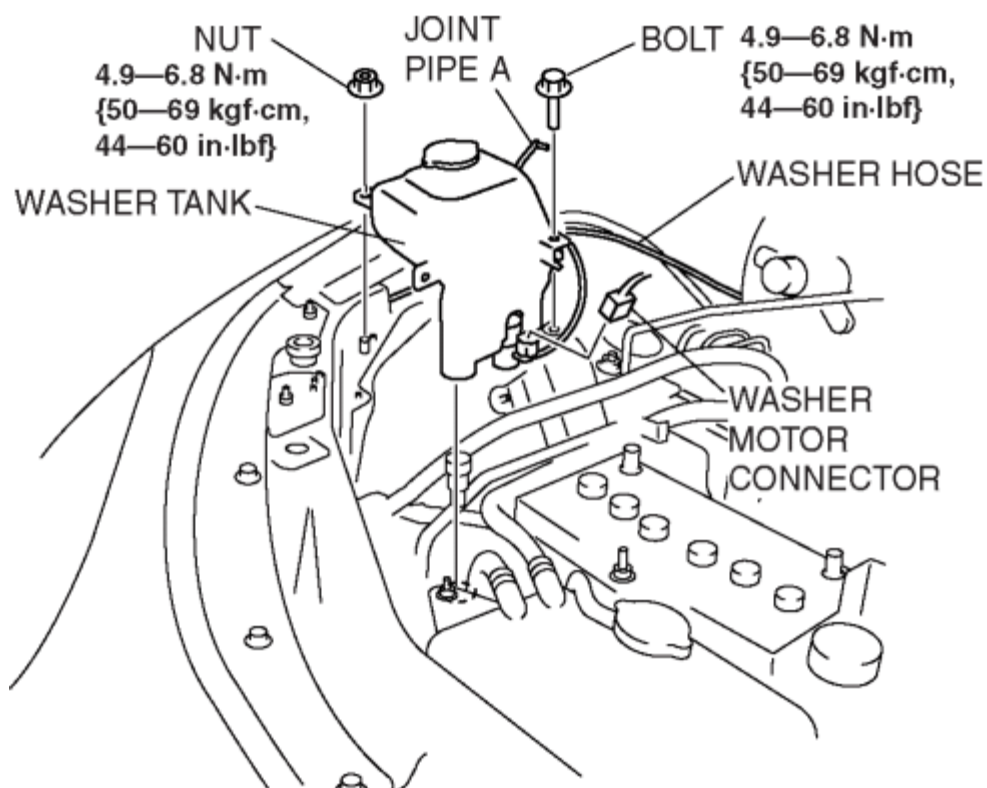


5. Remove the screws, then remove the wiper and washer switch.
6. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### WASHER TANK REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Disconnect the washer hose from joint pipe A.

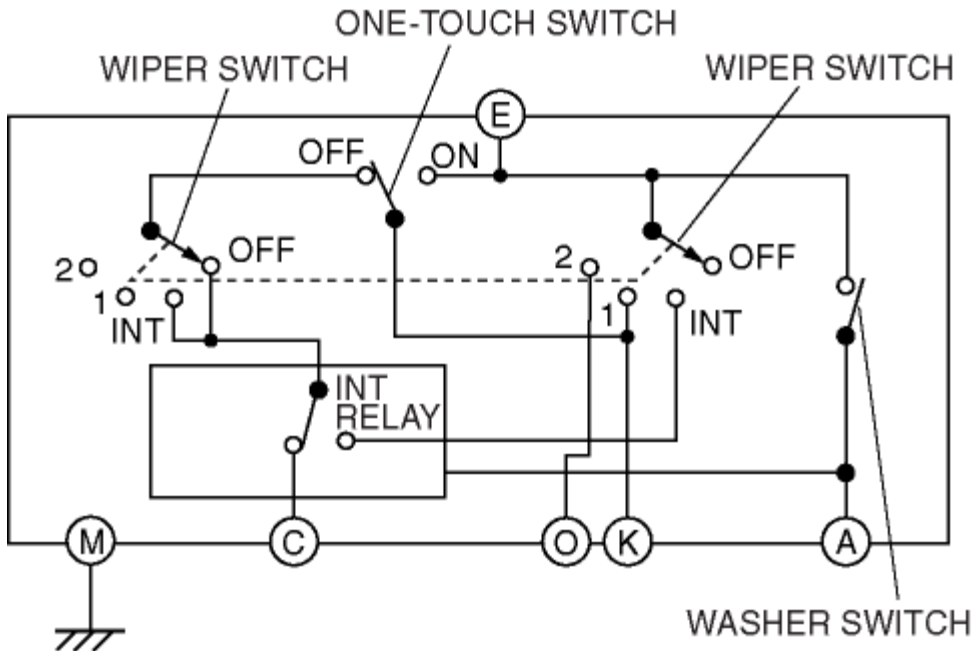


4. Remove the bolt and nut, then remove the washer tank.
5. Disconnect the washer motor connector.
6. Install in the reverse order of removal.

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WIPER AND WASHER SWITCH INSPECTION

- 1. Verify that the continuity between the wiper and washer switch is as indicated in the table.



O	M	K	X		E	C	A
*	*	*	*	*	*	*	*

- If not as indicated in the table, replace the wiper and washer switch.

○ — ○ : Continuity

Switch position		One-touch switch	Terminal				
			A	C	E	K	O
Wind-shield wiper switch	OFF	OFF		○ — ○			
		ON			○ — ○		
	INT	-		○ — ○			
	1	-			○ — ○		
	2	-			○ — ○ — ○		
Wind-shield washer switch	ON		○ — ○				

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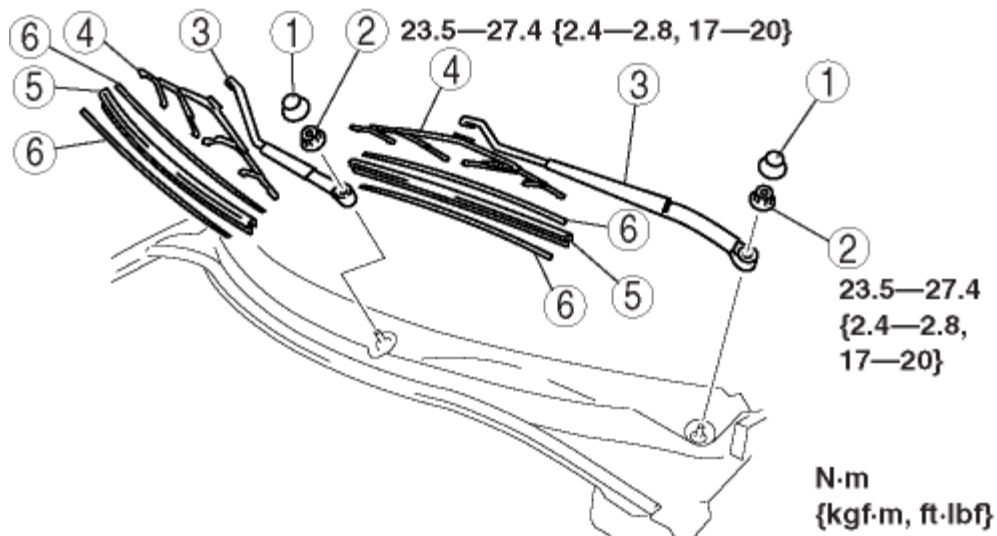
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WIPER ARM AND BLADE REMOVAL/INSTALLATION

1. Remove in the order indicated in the table.



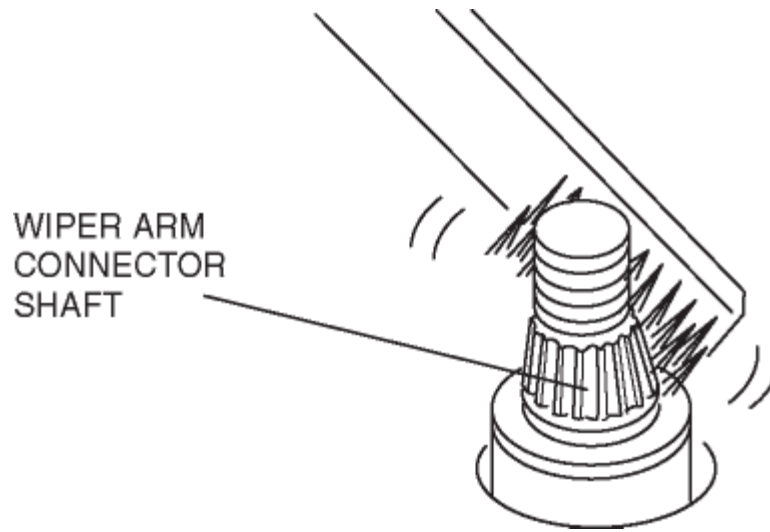
1	Cap
2	Nut
3	Wiper arm (See <a href="#">Wiper Arm Installation Note.</a> )
4	Wiper blade
5	Rubber brush
6	Backing plate

2. Install in the reverse order of removal.
3. Adjust the wiper arm and blade.(See [WIPER ARM AND BLADE ADJUSTMENT.](#))

Wiper Arm Installation Note



1. Clean the wiper arm connector shafts using a wire brush before installing the wiper arms.



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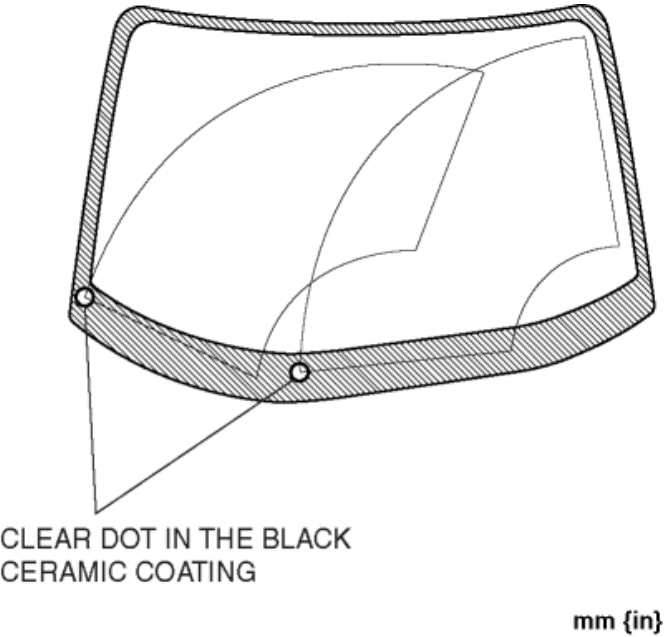
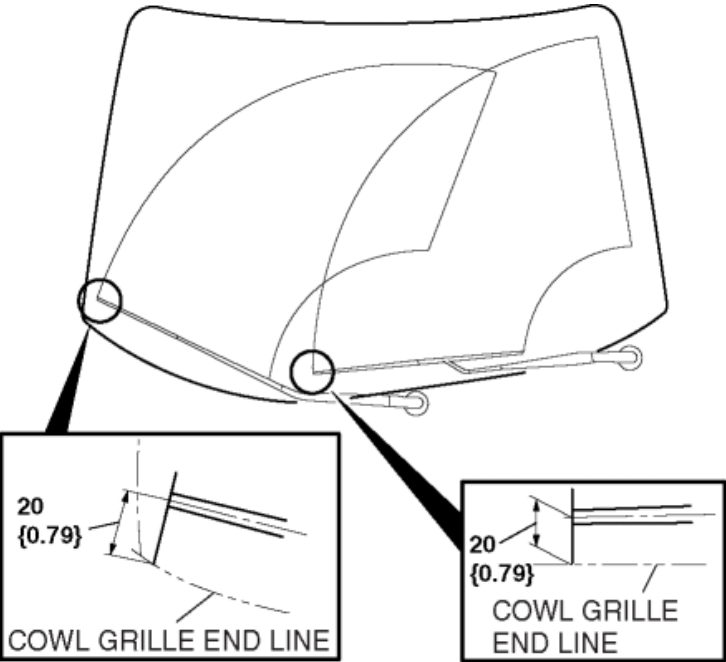
2008 - MX-5 - Body and Accessories

WIPER ARM AND BLADE ADJUSTMENT

- 1. Operate the wipers, and then turn off the wiper motor to set the wipers in the park position.
- 2. Slide the serrated connecting part and adjust the wiper arm and blade so that its end is aligned with the clear dot in the black ceramic coating on the inside of the windshield.

NOTE:

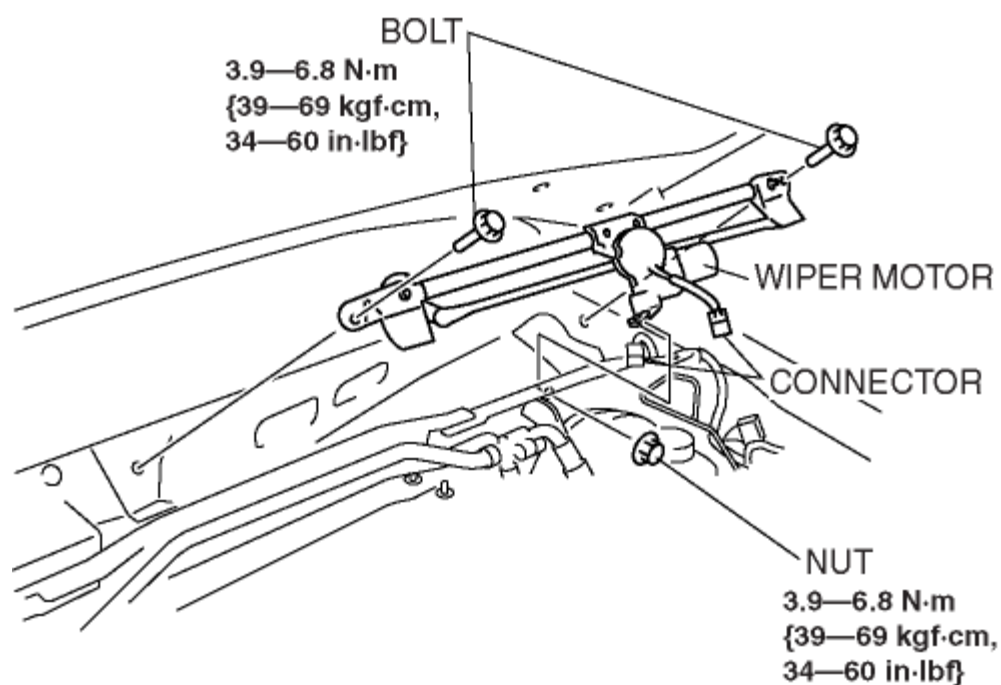
- If the hollowed mark in the ceramic coating cannot be located, measure the distance from the cowl grille end line, and adjust the wiper arm and blade.



## 2008 - MX-5 - Body and Accessories

### WIPER MOTOR REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the wiper arm and blade. (See [WIPER ARM AND BLADE REMOVAL/INSTALLATION.](#))
4. Remove the cowl grille. (See [COWL GRILLE REMOVAL/INSTALLATION.](#))
5. Disconnect the connector.

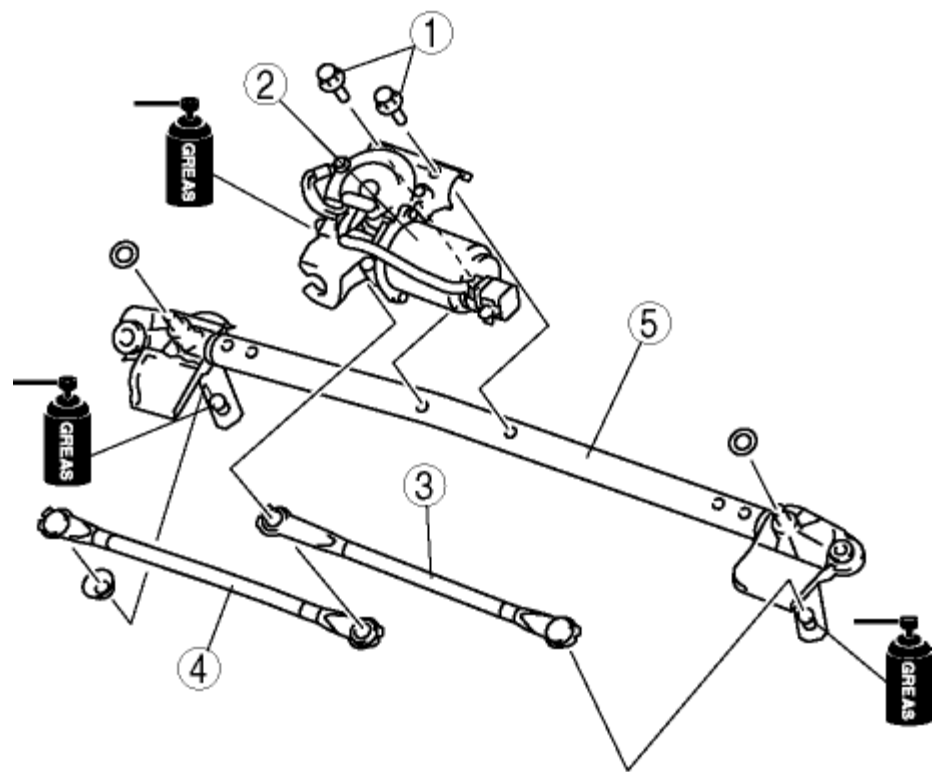


6. Remove the bolts.
7. Remove the nut.
8. Install in the reverse order of removal.

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WIPER MOTOR DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.

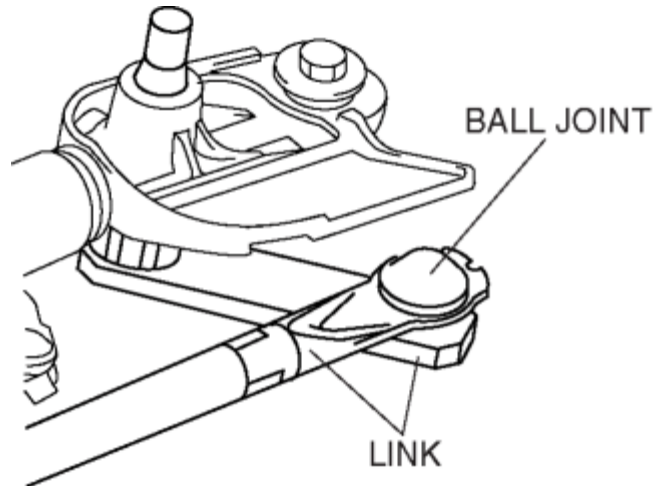


1	Bolt
2	Wiper motor (See <a href="#">Wiper Motor Assembly Note.</a> )
3	Wiper link No.1 (See <a href="#">Wiper Motor Assembly Note.</a> )
4	Wiper link No.2 (See <a href="#">Wiper Motor Assembly Note.</a> )
5	Main link (See <a href="#">Wiper Motor Assembly Note.</a> )

2. Assemble in the reverse order of disassembly.

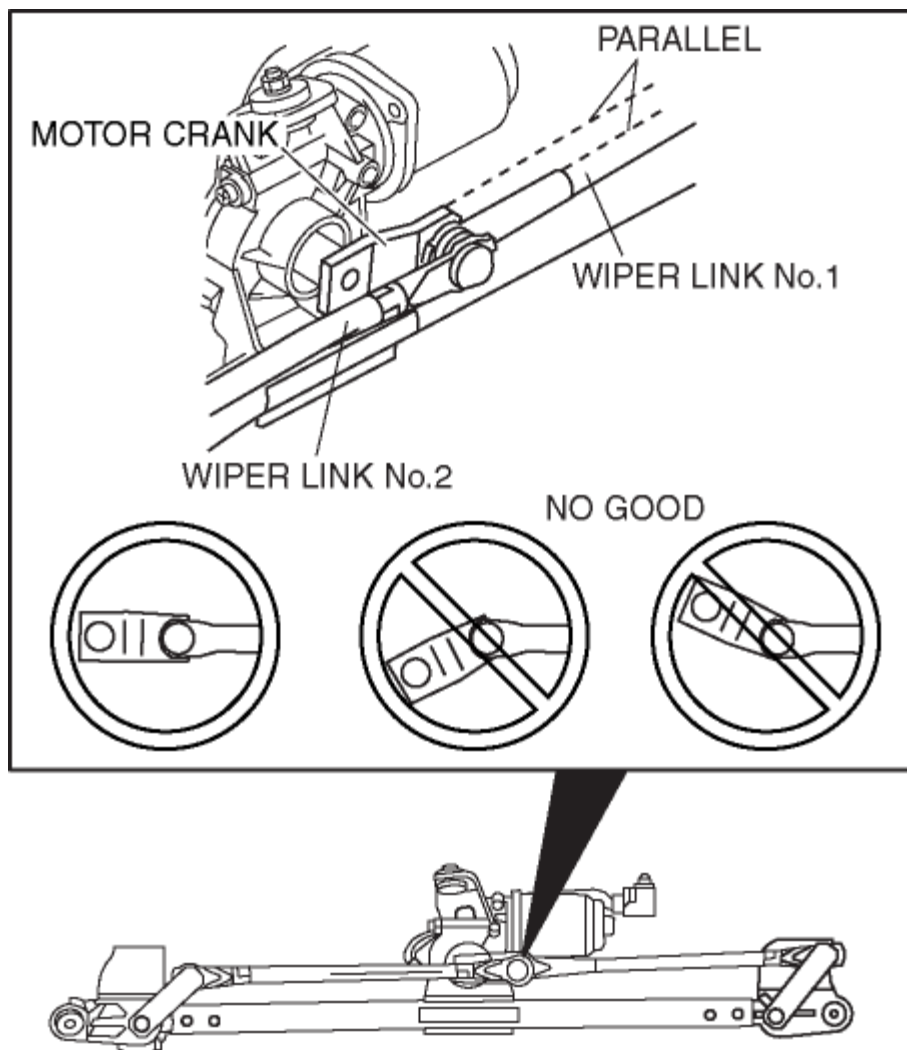
### **Ball Joint Assembly Note**

1. Use a clean rag to protect the link, and squeeze using pliers.



### **Wiper Motor Assembly Note**

1. Connect the wiper motor to the vehicle wiring harness connector, operate the wipers, and then stop them at the auto-stop position.
2. Adjust the motor crank, wiper link No.1, and wiper link No.2 so that they are parallel as shown in the figure.



3. Assemble the wiper motor.

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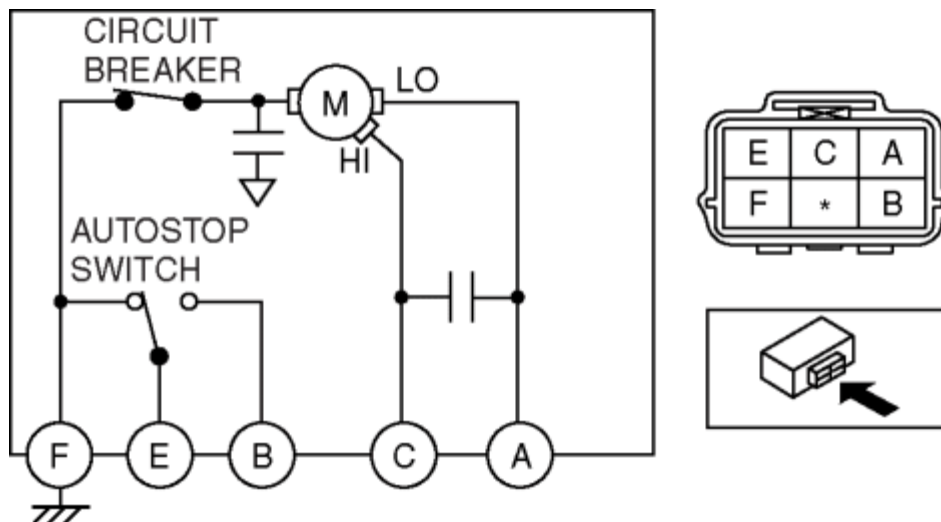
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## 2008 - MX-5 - Body and Accessories

### WIPER MOTOR INSPECTION

1. Disconnect the wiper motor connector.
2. Connect battery positive voltage to wiper motor terminal A or C, and ground to terminal F, then verify that the wipers operate as shown in the table.



- If the wipers do not operate as indicated in the table, replace the wiper motor.

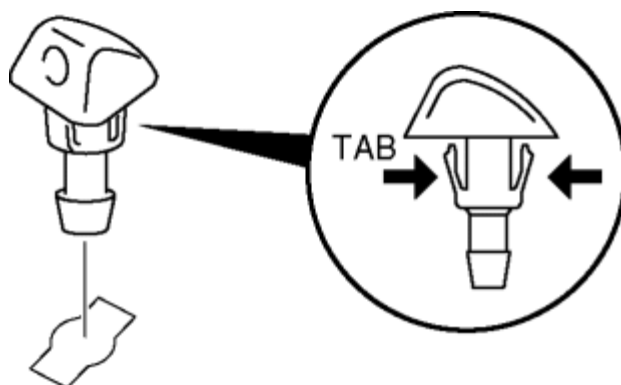
Terminal connected to battery positive voltage	Operation condition
C	HI
A	LO

3. Operate the wipers, disconnect battery positive voltage from terminal C, and then verify that the wipers stop.
  4. Connect wiper motor terminals E and A, and apply battery positive voltage to terminal B.
  5. Operate the wipers at low speed, and verify that they stop in the park position.
- If there is any malfunction, replace the wiper motor.

## 2008 - MX-5 - Body and Accessories

### WASHER NOZZLE REMOVAL/INSTALLATION

1. Remove the cowl grille. (See [COWL GRILLE REMOVAL/INSTALLATION.](#))
2. Remove the washer hose from the washer nozzle.
3. Squeeze the tabs of the washer nozzle.
4. Pull the washer nozzle out to remove it.



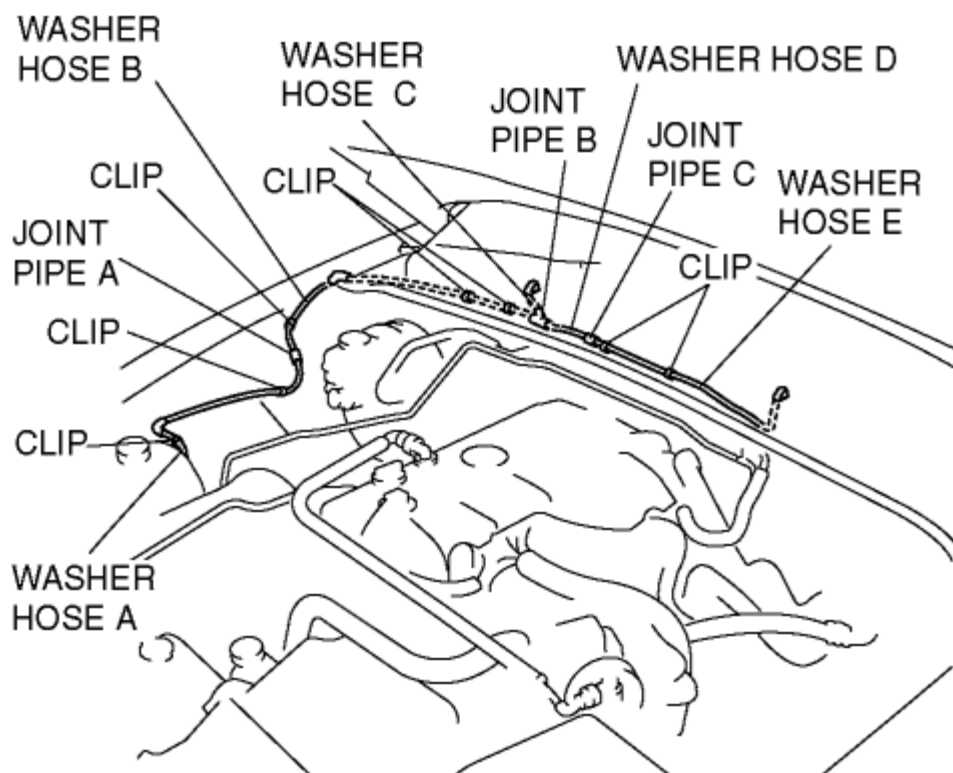
5. Install in the reverse order of removal.



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### WASHER HOSE REMOVAL/INSTALLATION

1. Remove the wiper arm and blade. (See [WIPER ARM AND BLADE REMOVAL/INSTALLATION.](#))
2. Disconnect joint pipe A, then remove washer hose A from clip.

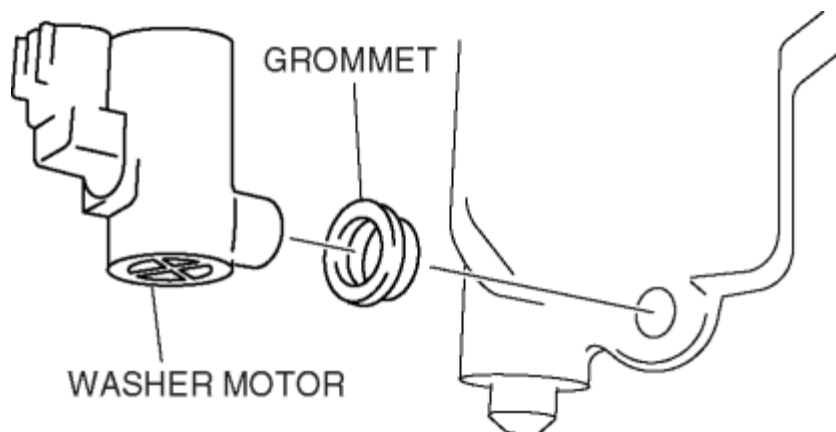


3. Remove the cowl grille. (See [COWL GRILLE REMOVAL/INSTALLATION.](#))
4. Remove clip.
5. Disconnect joint pipe B, then remove washer hose A.
6. Disconnect washer hose B from the washer nozzle, then remove washer hose B.
7. Disconnect joint pipe C, then remove washer hose C.
8. Remove washer hose D from clips.
9. Disconnect washer hose D from the washer nozzle, then remove washer hose D.
10. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### WASHER MOTOR REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the washer tank. (See [WASHER TANK REMOVAL/INSTALLATION.](#))
4. Remove the washer motor, then remove the grommet.

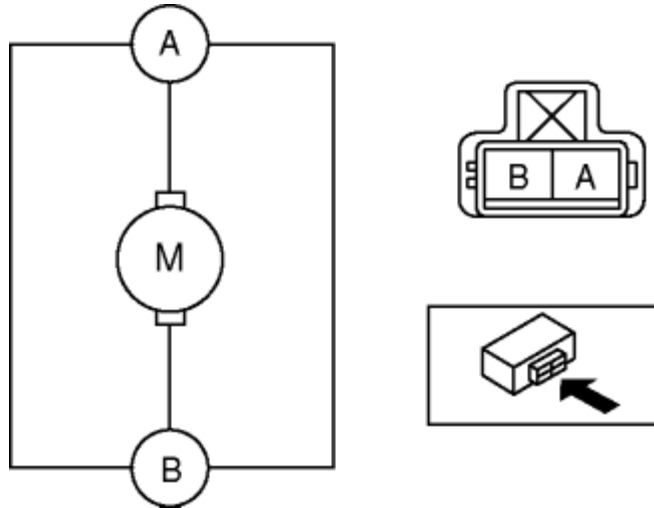


5. Install in the reverse order of removal.

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### WASHER MOTOR INSPECTION

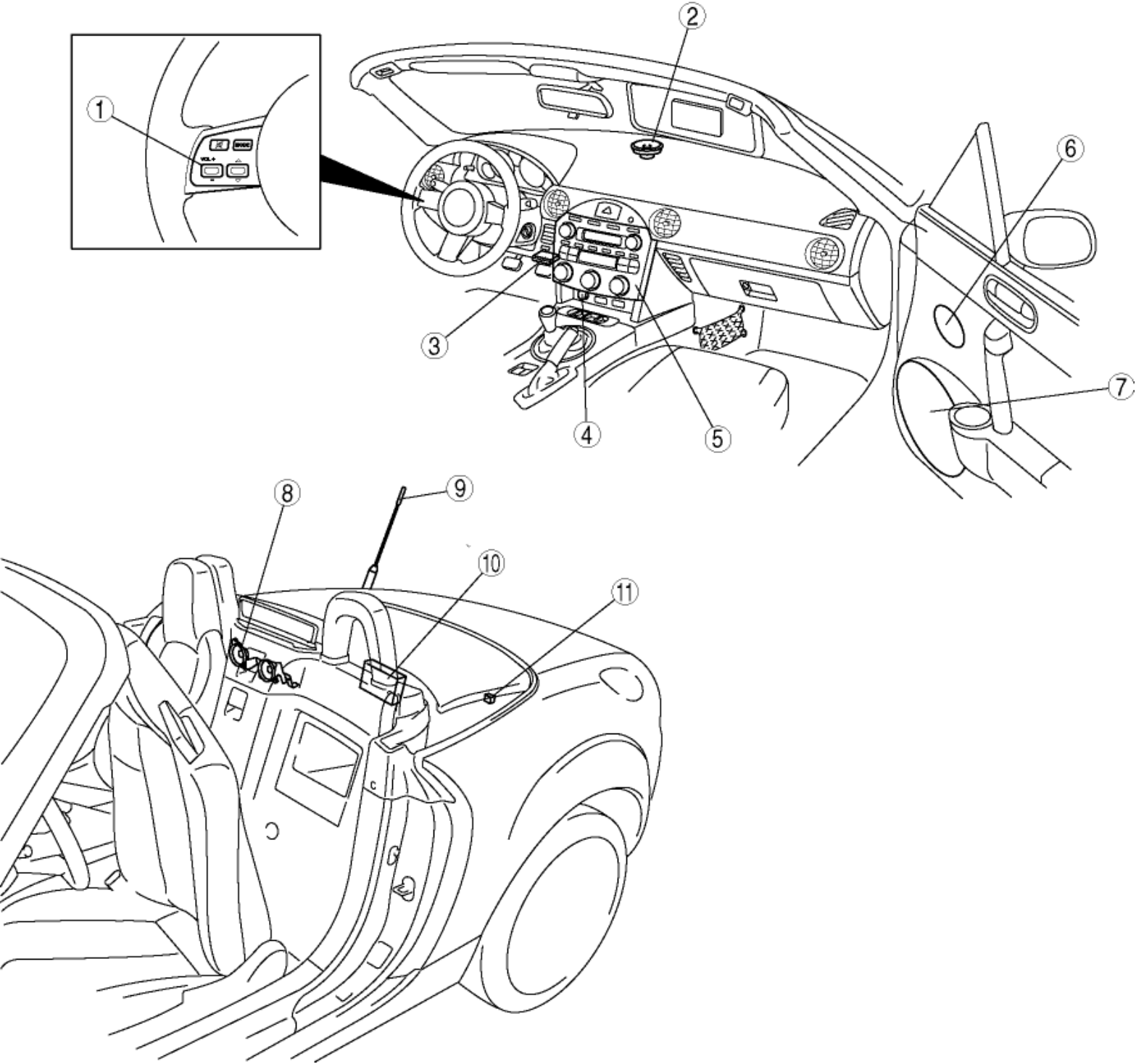
1. Connect battery positive voltage to washer motor terminal A and terminal B to ground.



2. Verify that the washer motor operates normally.
  - If there is any malfunction, replace the washer motor.

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ENTERTAINMENT LOCATION INDEX



- 1 Audio control switch  
(See [AUDIO CONTROL SWITCH REMOVAL/INSTALLATION.](#))

	(See <a href="#">AUDIO CONTROL SWITCH INSPECTION.</a> )
2	Center speaker (Vehicles with Bose)  (See <a href="#">CENTER SPEAKER REMOVAL/INSTALLATION.</a> )  (See <a href="#">CENTER SPEAKER INSPECTION.</a> )
3	AUDIOPILOT microphone (Vehicles with Bose)  (See <a href="#">AUDIOPILOT MICROPHONE REMOVAL/INSTALLATION.</a> )
4	Accessory socket  (See <a href="#">ACCESSORY SOCKET REMOVAL/INSTALLATION.</a> )  (See <a href="#">ACCESSORY SOCKET INSPECTION.</a> )
5	Center panel unit  (See <a href="#">CENTER PANEL UNIT REMOVAL/INSTALLATION.</a> )  (See <a href="#">CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY.</a> )  (See <a href="#">AUDIO UNIT DISASSEMBLY/ASSEMBLY.</a> )
6	Tweeter (Vehicles without Bose) / Door upper speaker (Vehicles with Bose)  (See <a href="#">TWEETER REMOVAL/INSTALLATION.</a> )  (See <a href="#">TWEETER INSPECTION.</a> )  (See <a href="#">DOOR UPPER SPEAKER INSPECTION.</a> )
7	Door speaker  (See <a href="#">DOOR SPEAKER REMOVAL/INSTALLATION.</a> )  (See <a href="#">DOOR SPEAKER INSPECTION.</a> )
8	Rear speaker  (See <a href="#">REAR SPEAKER REMOVAL/INSTALLATION.</a> )  (See <a href="#">REAR SPEAKER INSPECTION.</a> )
9	Manual antenna  (See <a href="#">MANUAL ANTENNA REMOVAL/INSTALLATION.</a> )  (See <a href="#">MANUAL ANTENNA INSPECTION.</a> )
10	Audio amplifier (Vehicles with Bose)  (See <a href="#">AUDIO AMPLIFIER REMOVAL/INSTALLATION.</a> )
11	Condenser  (See <a href="#">CONDENSER REMOVAL/INSTALLATION.</a> )

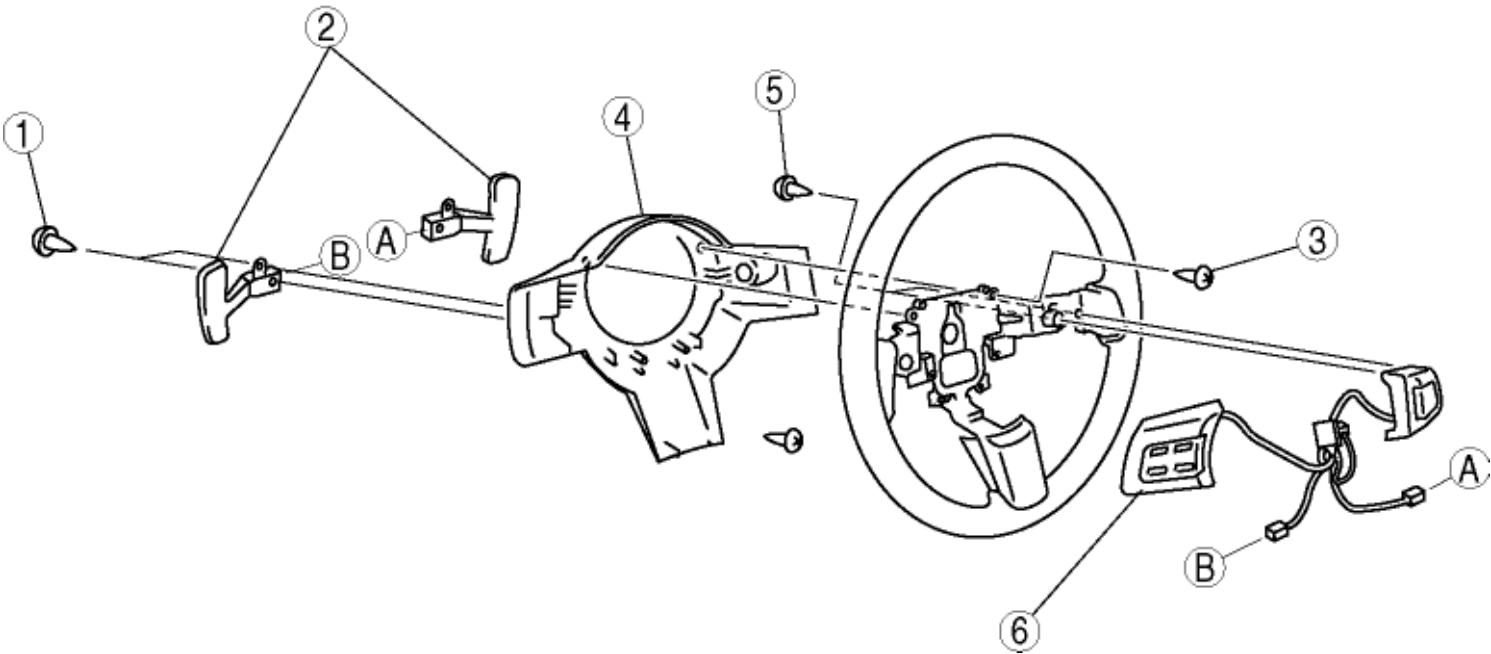


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AUDIO CONTROL SWITCH REMOVAL/INSTALLATION

NOTE:

- For vehicles with the cruise control system, the audio control switch harness and the cruise control switch harness are united, therefore they cannot be separated.
1. Remove the battery cover.
  2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
  3. Remove the driver-side air bag module. (See [DRIVER-SIDE AIR BAG MODULE REMOVAL/INSTALLATION](#).)
  4. Remove the steering wheel. (See [STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION](#).)
  5. Remove in the order indicated in the table.



1	Screw A
2	Steering shift switch (AT vehicles)
3	Screw B
4	Cover
5	Screw C

6	Audio control switch
---	----------------------

6. Install in the reverse order of removal.

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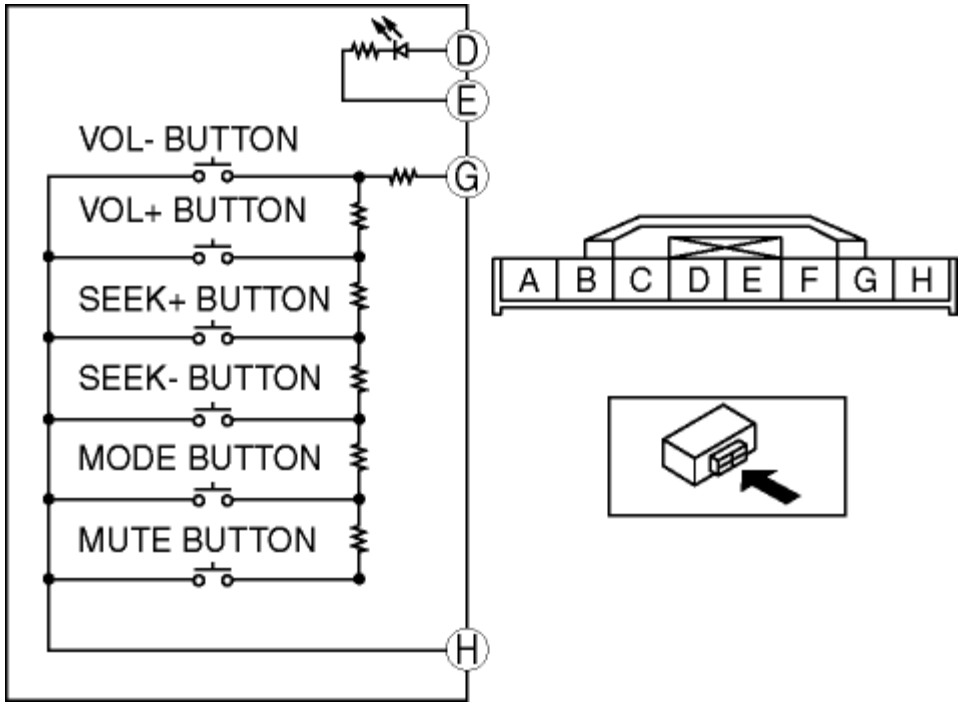
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AUDIO CONTROL SWITCH INSPECTION

1. Verify the resistance and continuity between the audio control switch terminals.



- If the resistance and continuity are not as indicated in the tables, replace the audio control switch.

Terminal			
D	E	G	H

R  
Resistance. See the table.

Switch position	Resistance (ohm)
VOL- switch ON	51—56
VOL+ switch ON	140—154

SEEK+ switch ON	286—315
SEEK- switch ON	534—589
MODE switch ON	985—1,080
MUTE switch ON	1,940—2,130
OFF	4,800—5,290

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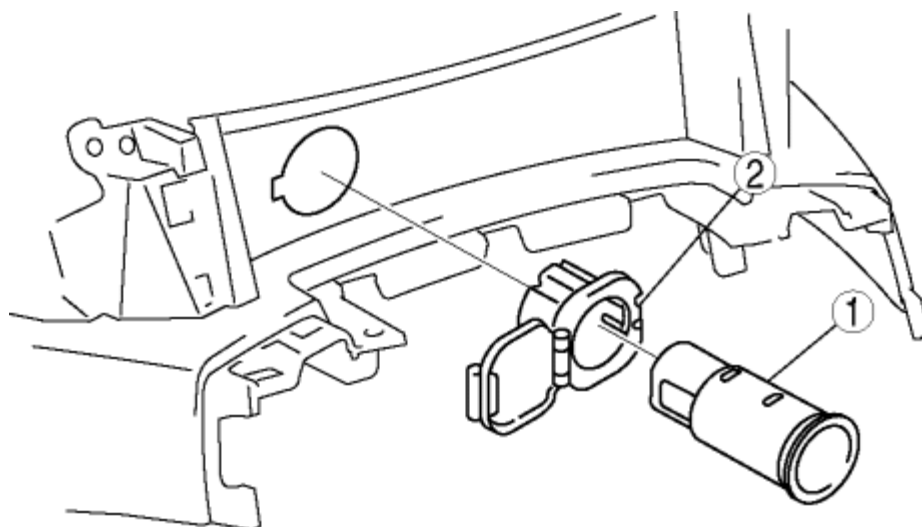
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## 2008 - MX-5 - Body and Accessories

### ACCESSORY SOCKET REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the console. (See [CONSOLE REMOVAL/INSTALLATION.](#))
4. Remove the side wall. (See [SIDE WALL REMOVAL/INSTALLATION.](#))
5. Remove the console panel. (See [CONSOLE PANEL REMOVAL/INSTALLATION.](#))
6. Remove in the order indicated in the table.

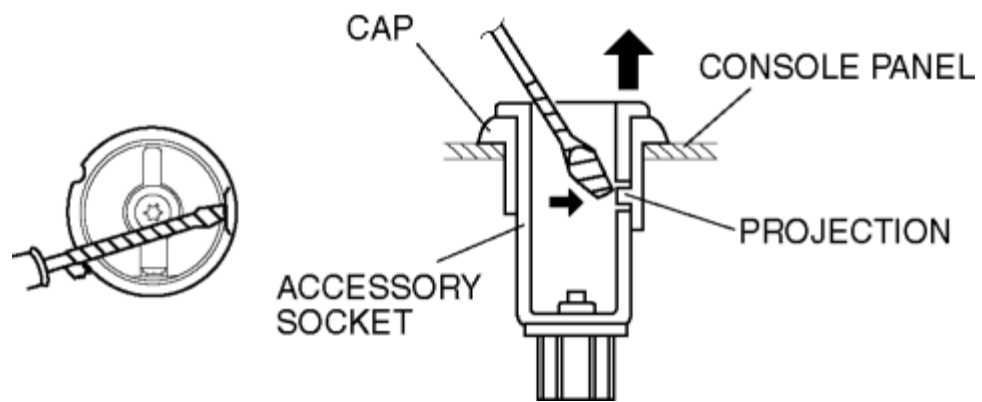


1	Accessory socket
	(See <a href="#">Accessory Socket Removal Note.</a> )
2	Cap
	(See <a href="#">Cap Removal Note.</a> )

7. Install in the reverse order of removal.

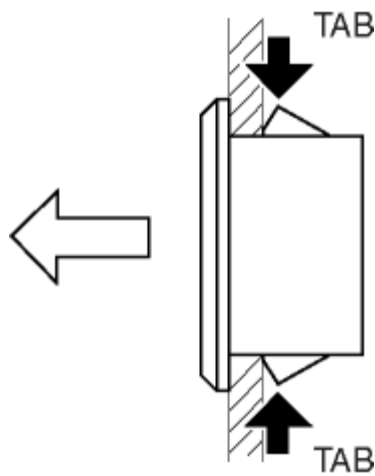
### Accessory Socket Removal Note

1. While pressing a tape-wrapped flathead screwdriver against the cap projection, pull the accessory socket outward.



## Cap Removal Note

1. While pressing the tabs, pull the cap outwards.



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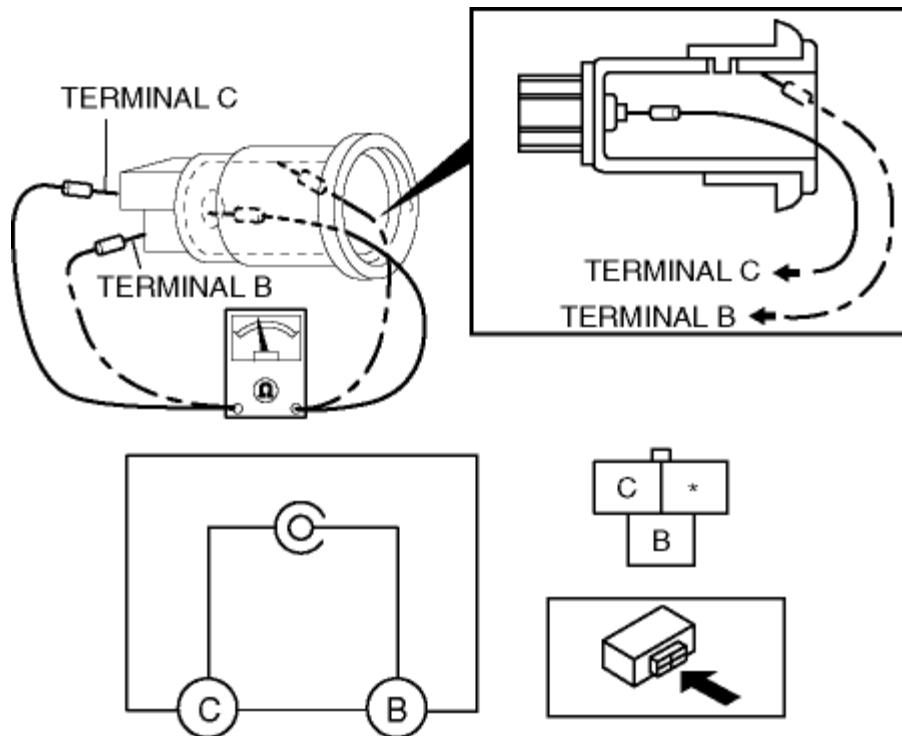
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## 2008 - MX-5 - Body and Accessories

### ACCESSORY SOCKET INSPECTION

1. Connect a tester as shown in the figure and verify that there is continuity.



- If the continuity cannot be verified, replace the accessory socket.

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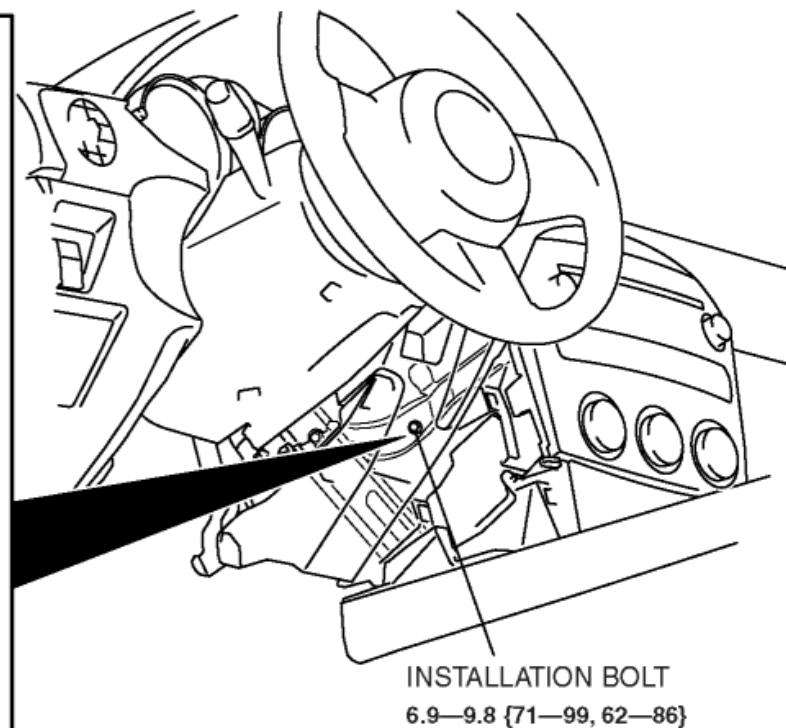
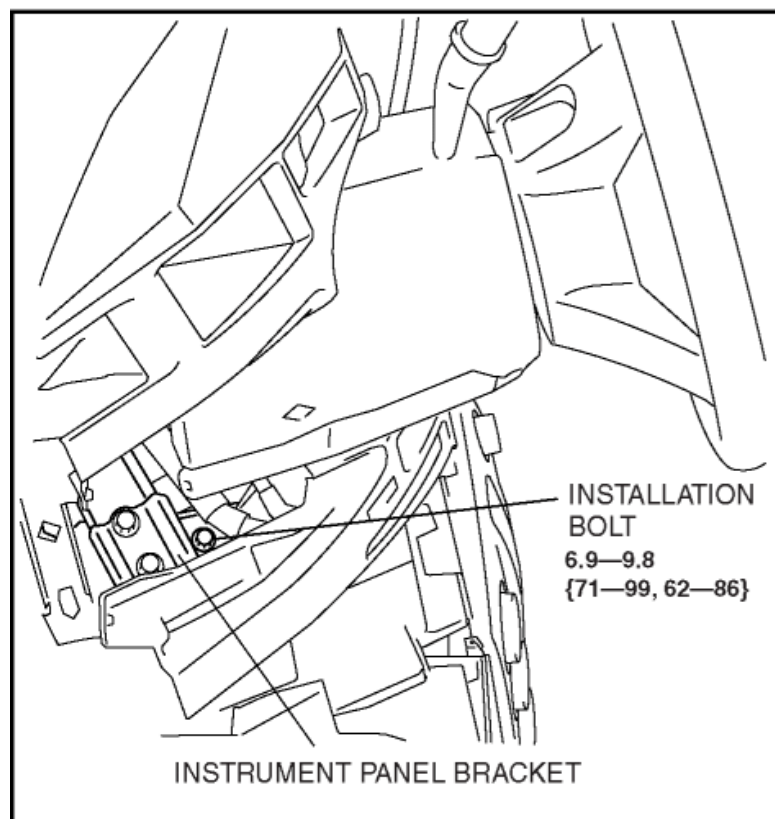
### CENTER PANEL UNIT REMOVAL/INSTALLATION

#### NOTE:

- Some vehicles are equipped with the center panel unit installation bolt depending on the vehicle production period.
1. Remove the battery cover.
  2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
  3. Remove the lower panel. (See [LOWER PANEL REMOVAL/INSTALLATION](#).)
  4. Remove the knee bolster. (See [KNEE BOLSTER REMOVAL/INSTALLATION](#).)
  5. Remove the side wall. (See [SIDE WALL REMOVAL/INSTALLATION](#).)
  6. Check if the vehicle has the installation bolt or not at the position shown in the figure from the underside of the driver-s seat.
    - If the installation bolt is equipped, remove it.

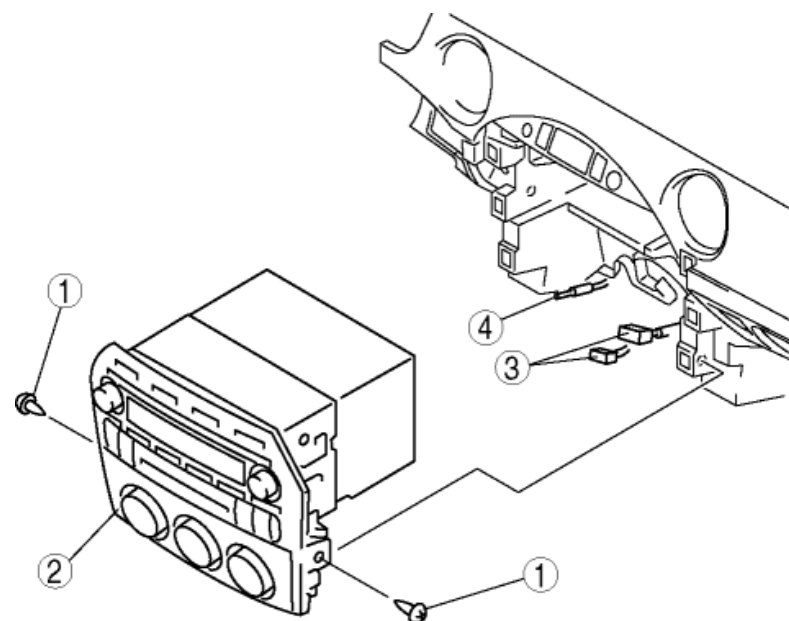
#### CAUTION:

- The center panel unit may be damaged if it is pulled out with the installation bolt installed. Verify that the installation bolt is removed before pulling out the center panel unit.



N·m {kgf·cm, in·lbf}

7. Remove in the order indicated in the table.



1	Screw
2	Center panel unit (See <a href="#">Center Panel Unit Removal Note.</a> )
3	Connector
4	Antenna feeder plug

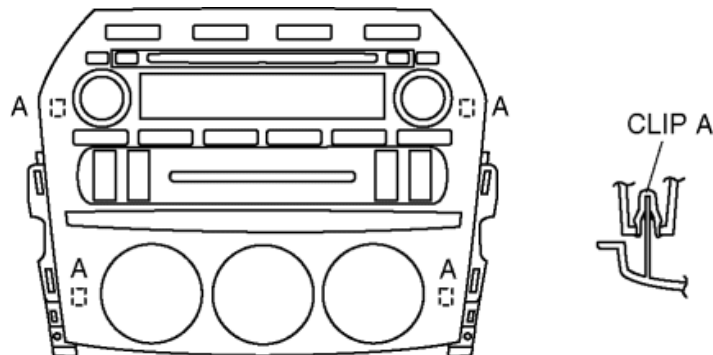
8. Install in the reverse order of removal.

**CAUTION:**

- When installing the center panel unit, make sure that the wiring harness and antenna feeder are not caught between the unit and dashboard. If the wiring harness or the antenna feeder is caught between the unit and dashboard, it may cause malfunctions.

**Center Panel Unit Removal Note**

1. Pull the center panel unit outward, detach clip A from the dashboard, and then remove the center panel unit.



2. When removing the center panel unit, disconnect the audio unit connector (24-pin) first to aid in disconnecting other connectors and the antenna plug.

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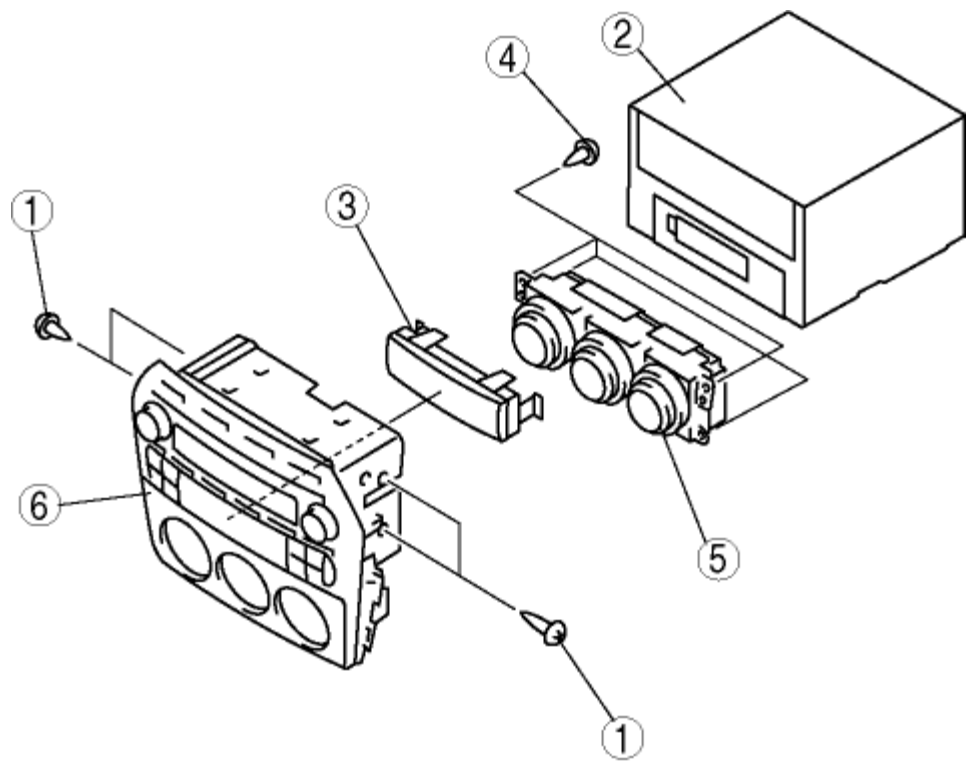
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CENTER PANEL UNIT DISASSEMBLY/ASSEMBLY

CAUTION:

- Before disassembling the center panel unit, spread a cloth on the floor to put the disassembled parts on. This protects the surface of the panel from scratches or dirt.

1. Disassemble in the order indicated in the table.



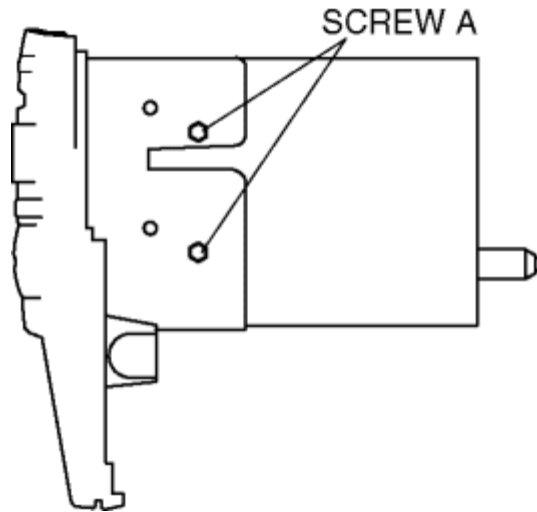
1	Screw A (See <a href="#">Screw A Assemble Note.</a> )
2	Audio unit
3	Cover
4	Screw B
5	Climate control unit

6 Center panel

2. Assemble in the reverse order of disassembly.

### Screw A Assemble Note

1. Tighten screws A at the position shown in the figure.



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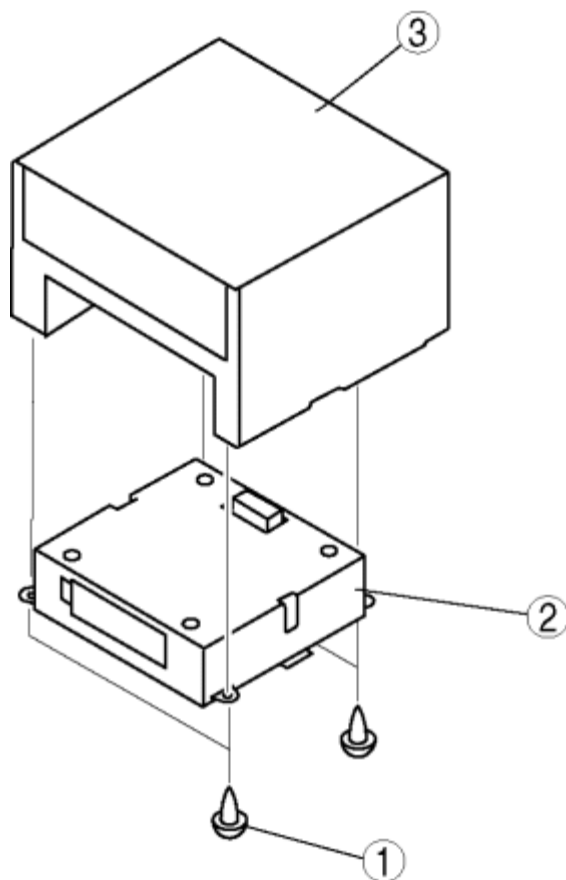
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## 2008 - MX-5 - Body and Accessories

### AUDIO UNIT DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.



1	Screw
2	Lower module
3	Base unit

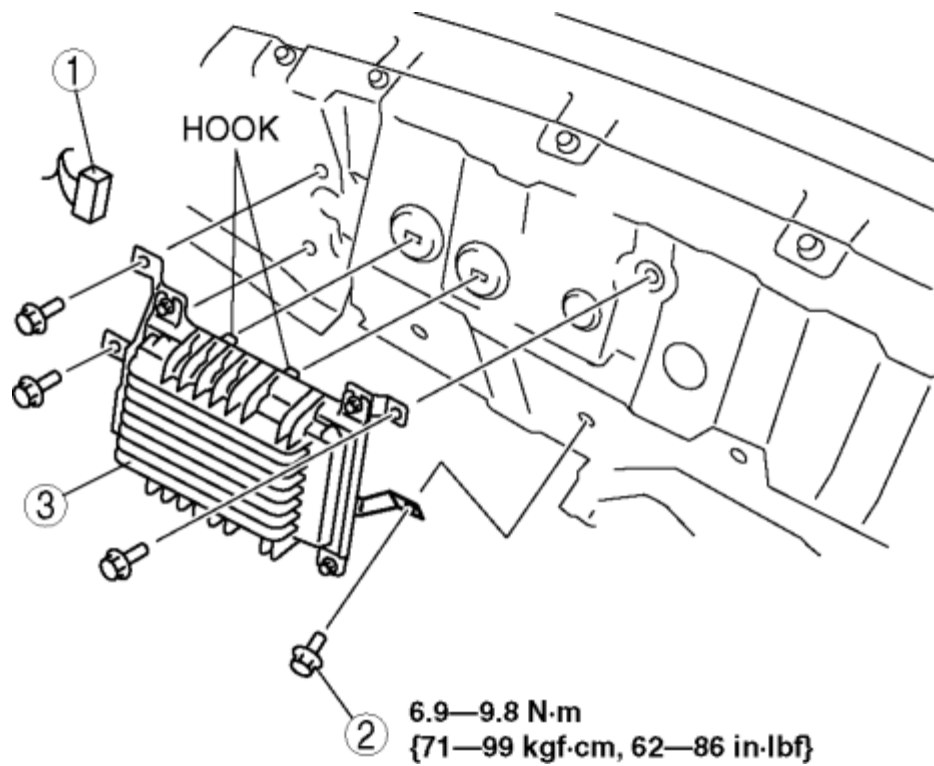
2. Assemble in the reverse order of disassembly.

## 2008 - MX-5 - Body and Accessories

### AUDIO AMPLIFIER REMOVAL/INSTALLATION

#### Except Power Retractable hardtop

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the following parts:
  - a. Console (See [CONSOLE REMOVAL/INSTALLATION.](#))
  - b. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION.](#))
  - c. Scuff plate ([SCUFF PLATE REMOVAL/INSTALLATION.](#))
  - d. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION.](#))
  - e. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION.](#))
  - f. Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION.](#))
  - g. Back trim (See [BACK TRIM REMOVAL/INSTALLATION.](#))
  - h. Seat belt set plate (See [SEAT BELT REMOVAL/INSTALLATION.](#))
  - i. Seat back crossmember assembly (See [SEAT BACK CROSSMEMBER ASSEMBLY REMOVAL/INSTALLATION.](#))
  - j. Rear side trim (See [REAR SIDE TRIM REMOVAL/INSTALLATION.](#))
  - k. Rear package trim (See [REAR PACKAGE TRIM REMOVAL/INSTALLATION.](#))
4. Remove in the order indicated in the table.



1	Connector
2	Bolt
3	Audio amplifier

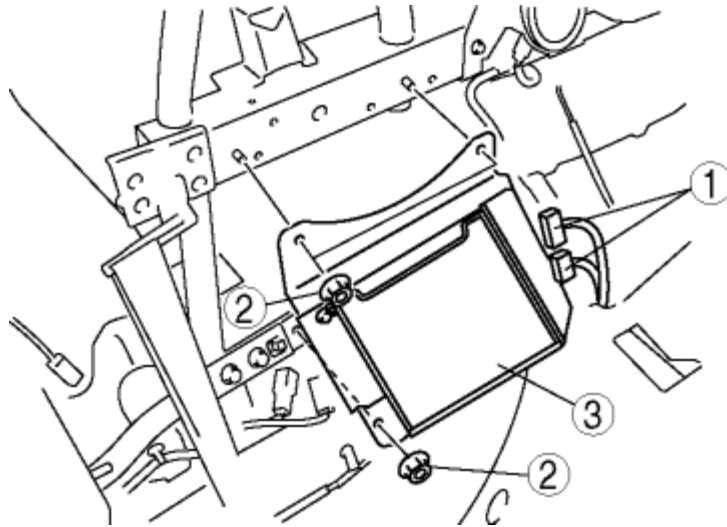
5. Install in the reverse order of removal.

## Power Retractable hardtop

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the following parts:
  - a. Console (See [CONSOLE REMOVAL/INSTALLATION](#).)
  - b. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION](#).)
  - c. Scuff plate ([SCUFF PLATE REMOVAL/INSTALLATION](#).)
  - d. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION](#).)
  - e. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION](#).)
  - f. Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION](#).)

g. Back trim (See **BACK TRIM REMOVAL/INSTALLATION.**)

4. Remove in the order indicated in the table.



1	Connector
2	Nut
3	Audio amplifier

5. Install in the reverse order of removal.

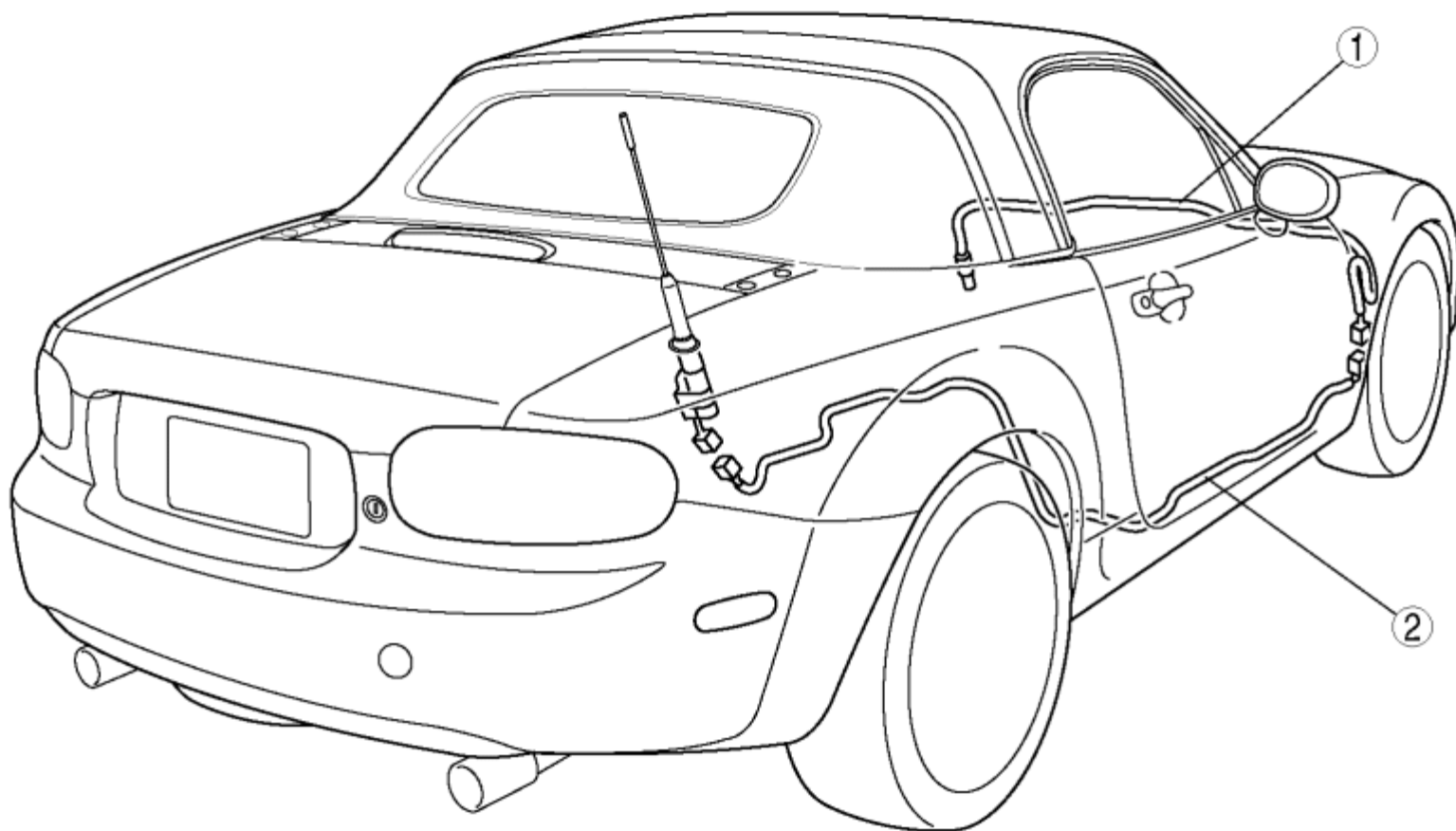
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## 2008 - MX-5 - Body and Accessories

### ANTENNA FEEDER LOCATION



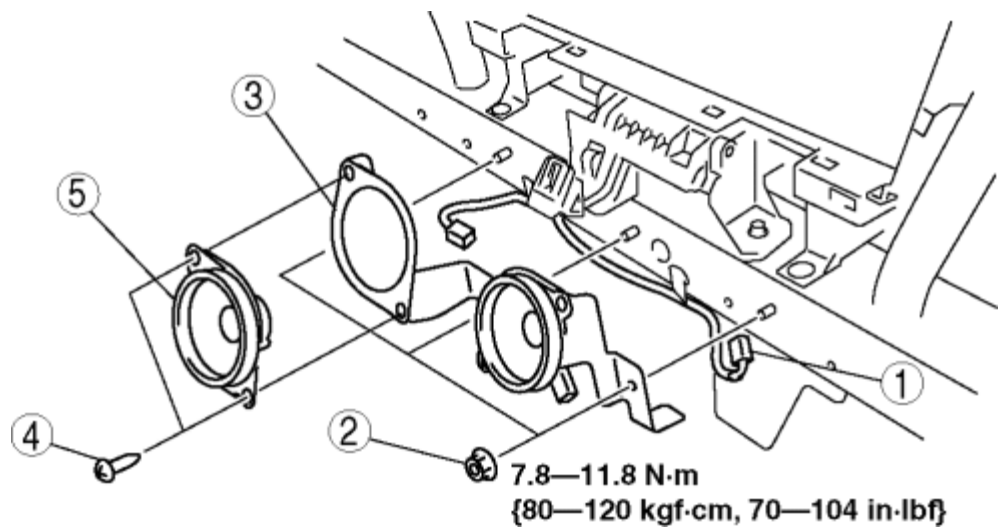
1	AM/FM antenna feeder No.1
---	---------------------------

2	AM/FM antenna feeder No.2
---	---------------------------

2008 - MX-5 - Body and Accessories

REAR SPEAKER REMOVAL/INSTALLATION

- 1. Remove the battery cover.
- 2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
- 3. Remove the following parts:
  - a. Console (See [CONSOLE REMOVAL/INSTALLATION.](#))
  - b. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION.](#))
  - c. Scuff plate ([SCUFF PLATE REMOVAL/INSTALLATION.](#))
  - d. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION.](#))
  - e. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION.](#))
  - f. Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION.](#))
  - g. Back trim (See [BACK TRIM REMOVAL/INSTALLATION.](#))
- 4. Remove in the order indicated in the table.



1	Connector
2	Nut
3	Bracket (with Bose®)
	Bracket and rear speaker (without Bose®)



4	Screw
5	Rear speaker (with Bose®)

5. Install in the reverse order of removal.

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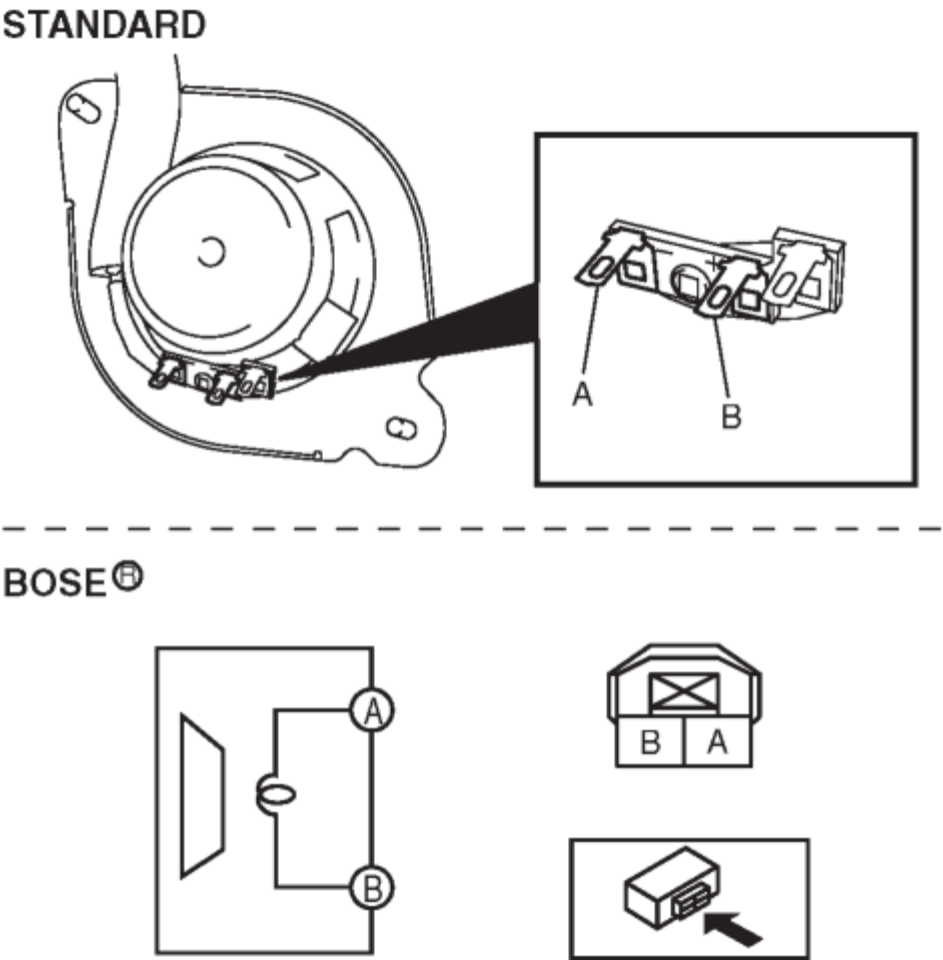
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2008 - MX-5 - Body and Accessories

REAR SPEAKER INSPECTION

- 1. Inspect for resistance between the rear speaker terminals using an ohmmeter.



- If the resistance is not within the specification, replace the rear speaker.

○—○ : Resistance

Test condition	Terminal	
	A	B
Under any condition	○—○	○—○ R

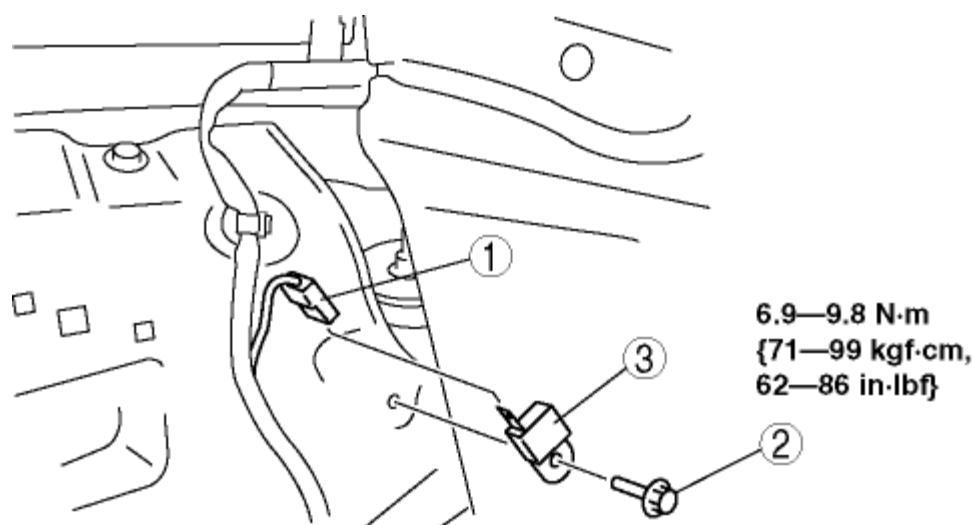
R : 8 ohms (standard)  
3.6 ohms (BOSE®)



## 2008 - MX-5 - Body and Accessories

### CONDENSER REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the following parts:
  - a. Console (See [CONSOLE REMOVAL/INSTALLATION.](#))
  - b. Quarter trim (See [QUARTER TRIM REMOVAL/INSTALLATION.](#))
  - c. Scuff plate ([SCUFF PLATE REMOVAL/INSTALLATION.](#))
  - d. Tire house trim (See [TIRE HOUSE TRIM REMOVAL/INSTALLATION.](#))
  - e. Aeroboard (See [AEROBOARD REMOVAL/INSTALLATION.](#))
  - f. Front seat back bar garnish (See [SEAT BACK BAR GARNISH REMOVAL/INSTALLATION.](#))
  - g. Back trim (See [BACK TRIM REMOVAL/INSTALLATION.](#))
  - h. Seat belt set plate (See [SEAT BELT REMOVAL/INSTALLATION.](#))
  - i. Seat back crossmember assembly (See [SEAT BACK CROSSMEMBER ASSEMBLY REMOVAL/INSTALLATION.](#))
  - j. Rear side trim (See [REAR SIDE TRIM REMOVAL/INSTALLATION.](#))
  - k. Rear package trim (See [REAR PACKAGE TRIM REMOVAL/INSTALLATION.](#))
4. Remove in the order indicated in the table.



1	Connector
2	Bolt
3	Condenser

5. Install in the reverse order of removal.

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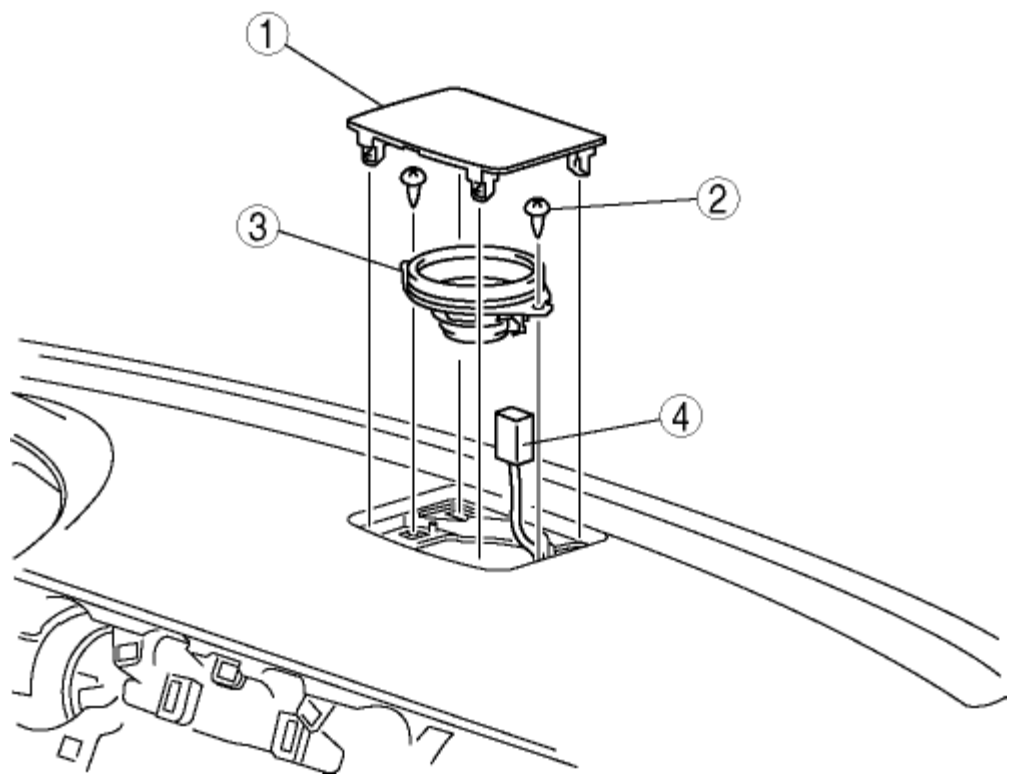
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2008 - MX-5 - Body and Accessories

CENTER SPEAKER REMOVAL/INSTALLATION

- 1. Remove the battery cover.
- 2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
- 3. Remove in the order indicated in the table.

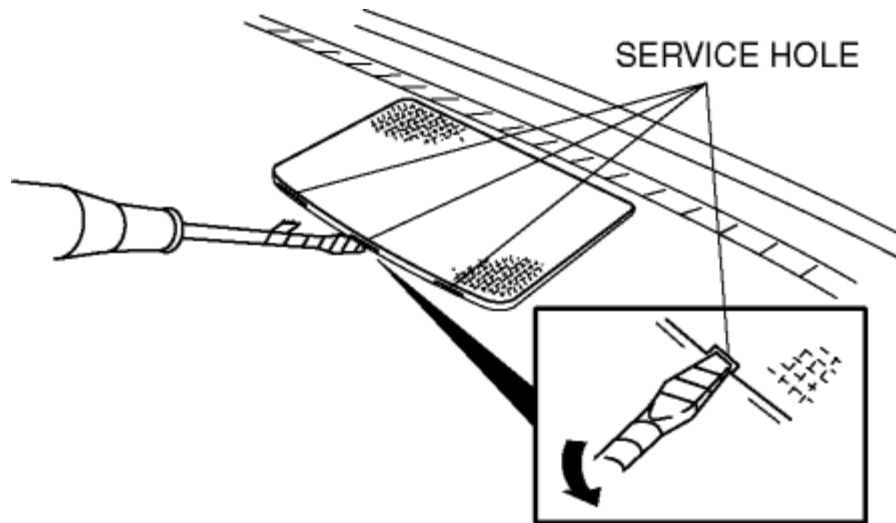


1	Center speaker cover (See <a href="#">Center Speaker Cover Removal Note.</a> )
2	Screw
3	Center speaker
4	Connector

- 4. Install in the reverse order of removal.

## Center Speaker Cover Removal Note

1. Insert a tape-wrapped flathead screwdriver into the service hole.



2. Pry with the screwdriver in the direction shown by the arrow to remove the center speaker cover.

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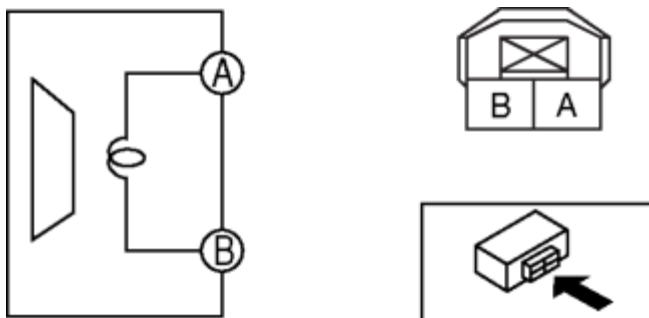
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## 2008 - MX-5 - Body and Accessories

### CENTER SPEAKER INSPECTION

1. Verify the resistance between center speaker terminals.



- If the resistance is not within the specification, replace the center speaker.

#### Resistance

- 3.6 ohms

2. Connect a **1.5 V** battery to the center speaker and verify that noise is heard from the center speaker.

- If no noise is heard, replace the center speaker.

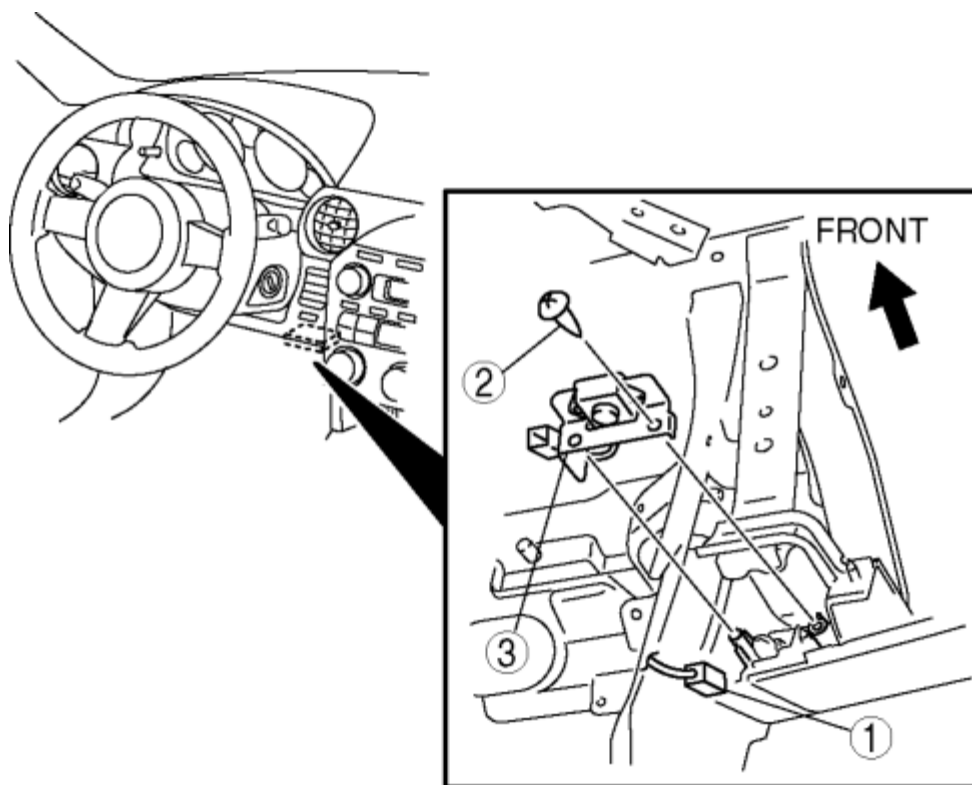


## 2008 - MX-5 - Body and Accessories

### AUDIOPILOT MICROPHONE REMOVAL/INSTALLATION

#### NOTE:

- "AudioPilot" is a registered trademark of Bose® Corporation.
1. Remove the battery cover.
  2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
  3. Remove in the order indicated in the table.



1	Connector
2	Screw
3	AudioPilot microphone

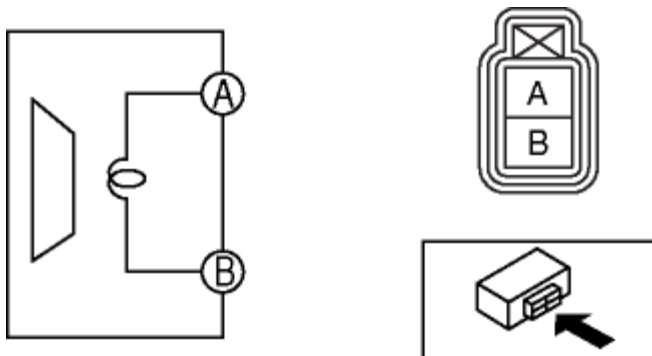
4. Install in the reverse order of removal.



## 2008 - MX-5 - Body and Accessories

### DOOR SPEAKER INSPECTION

1. Verify the resistance between door speaker terminals.



- If the resistance is not within the specification, replace the door speaker.

#### Resistance

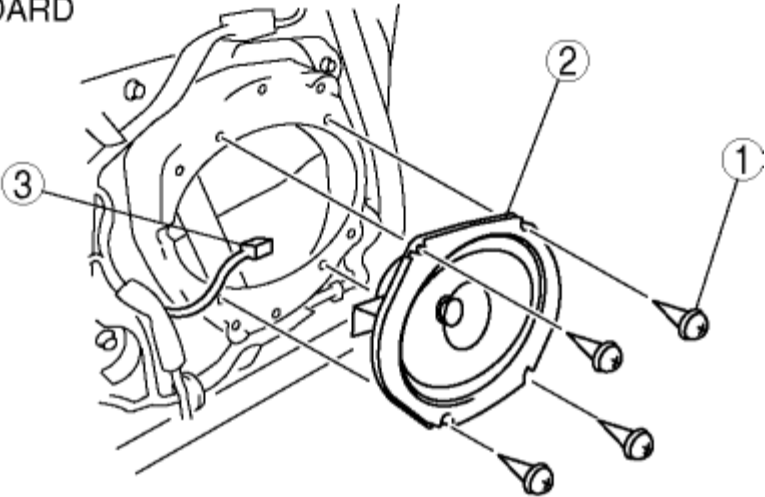
- Standard: 4 ohms
  - Bose®: 1 ohm
2. Connect a **1.5 V** battery to the door speaker and verify that noise is heard from the door speaker.
    - If no noise is heard, replace the door speaker.

2008 - MX-5 - Body and Accessories

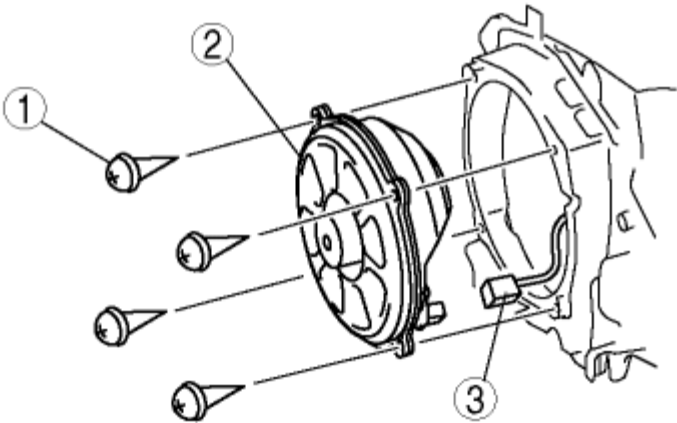
DOOR SPEAKER REMOVAL/INSTALLATION

- 1. Remove the battery cover.
- 2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
- 3. Remove the door trim.(See [DOOR TRIM REMOVAL/INSTALLATION.](#))
- 4. Remove in the order indicated in the table.

STANDARD



Bose®

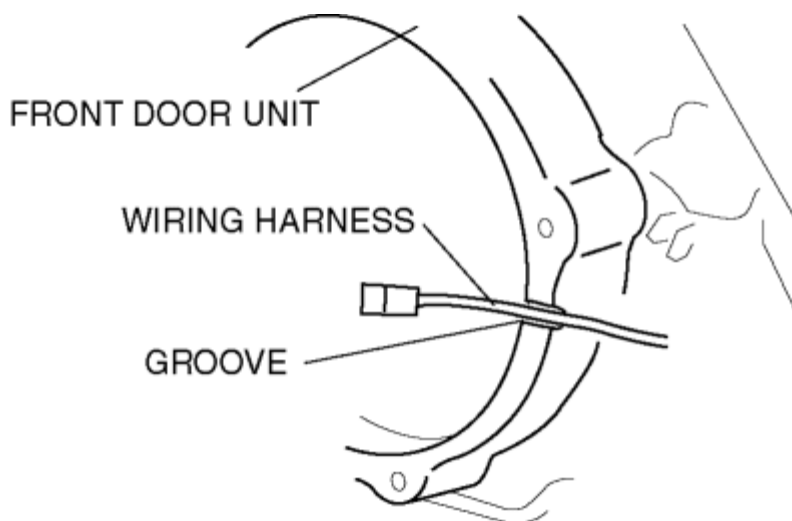


1	Screw
2	Door speaker
	(See <a href="#">Door Speaker Installation Note.</a> )

5. Install in the reverse order of removal.

### Door Speaker Installation Note

1. Remove the speaker with the wiring harness passing through the groove of the front door module.



#### CAUTION:

- If the speaker is installed with the wiring harness out of the groove, an open circuit in the wiring harness could occur.

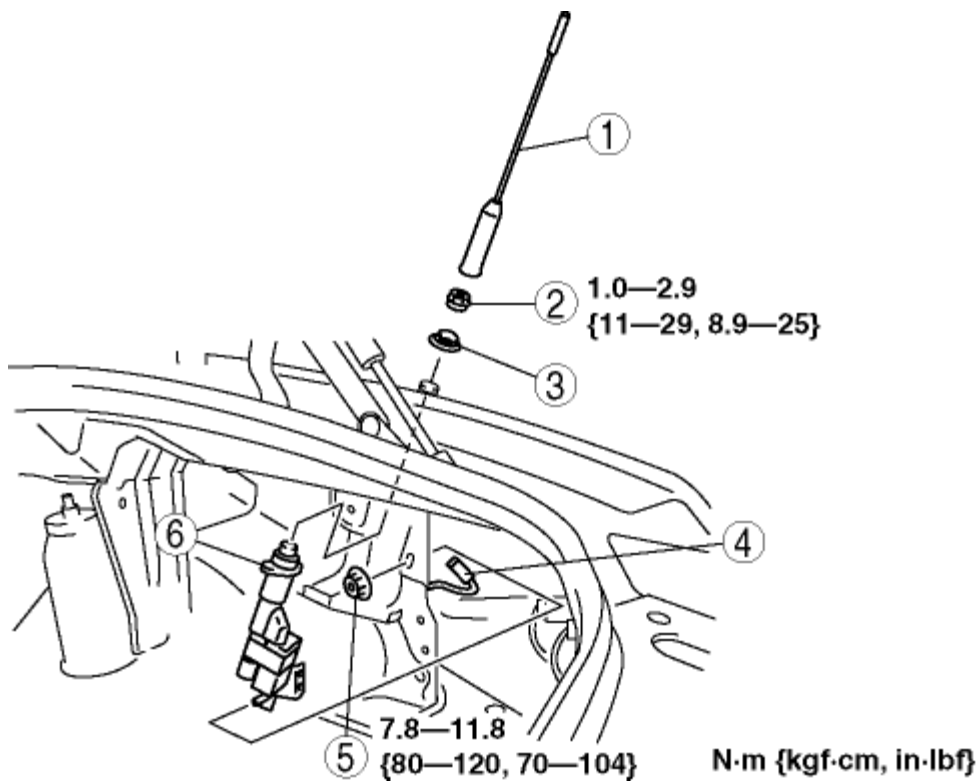
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2008 - MX-5 - Body and Accessories

MANUAL ANTENNA REMOVAL/INSTALLATION

- 1. Remove the battery cover.
- 2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
- 3. Remove the jack.
- 4. Remove in the order indicated in the table.

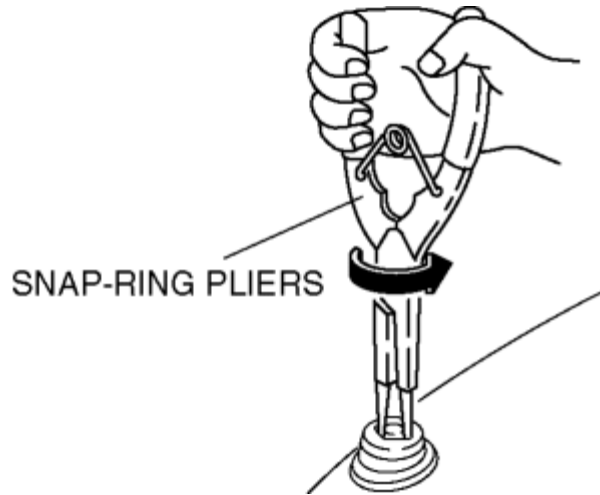


1	Antenna rod
2	Mounting nut (See <a href="#">Mounting Nut Removal Note</a> .)
3	Spacer
4	Connector
5	Nut

5. Install in the reverse order of removal.

### Mounting Nut Removal Note

1. Use snap ring pliers to remove the mounting nut.



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## 2008 - MX-5 - Body and Accessories

### MANUAL ANTENNA INSPECTION

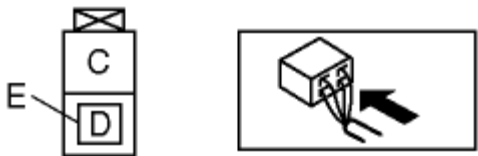
**NOTE:**

- A amplifier is built into the manual antenna.

#### Antenna Amplifier

1. Turn on the audio unit and radio, and measure the voltage at manual antenna connector terminal C.

MANUAL ANTENNA  
HARNESS-SIDE CONNECTOR



- If the voltage is B+, go to the next step.
- If the voltage is not B+, inspect the audio unit or the antenna feeder.

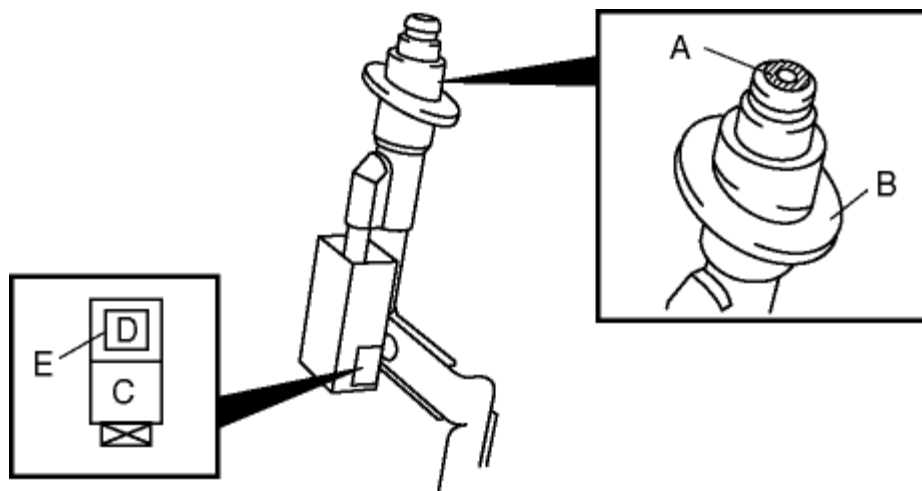
#### Feeder

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Disconnect the manual antenna connector.
4. Inspect for continuity between the manual antenna terminals using an ohmmeter.
  - If not as specified, replace the manual antenna.

○—○ : Continuity

Step	Terminal			
	A	B	D	E
1	○		○	
2		○		○





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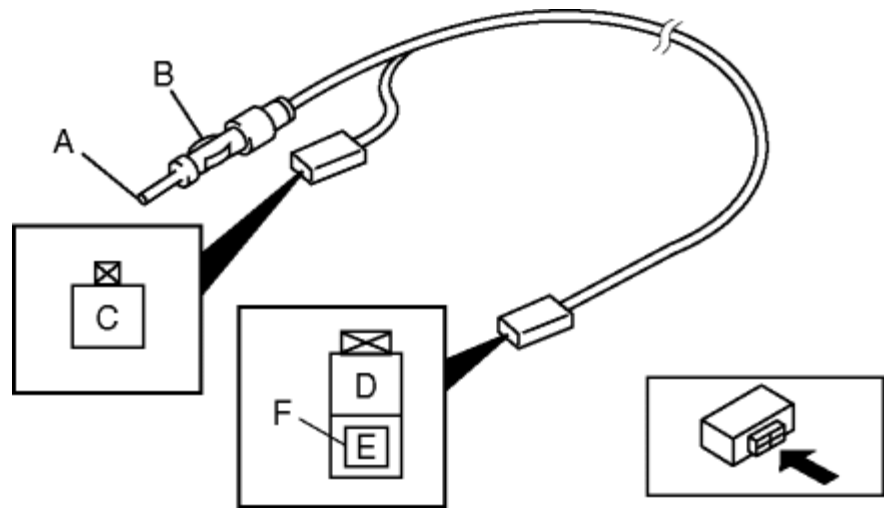
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2008 - MX-5 - Body and Accessories

AM/FM ANTENNA FEEDER NO.1 INSPECTION

1. Verify that the continuity is as indicated in the table.



- If not as indicated in the table, replace the AM/FM antenna feeder No.1.

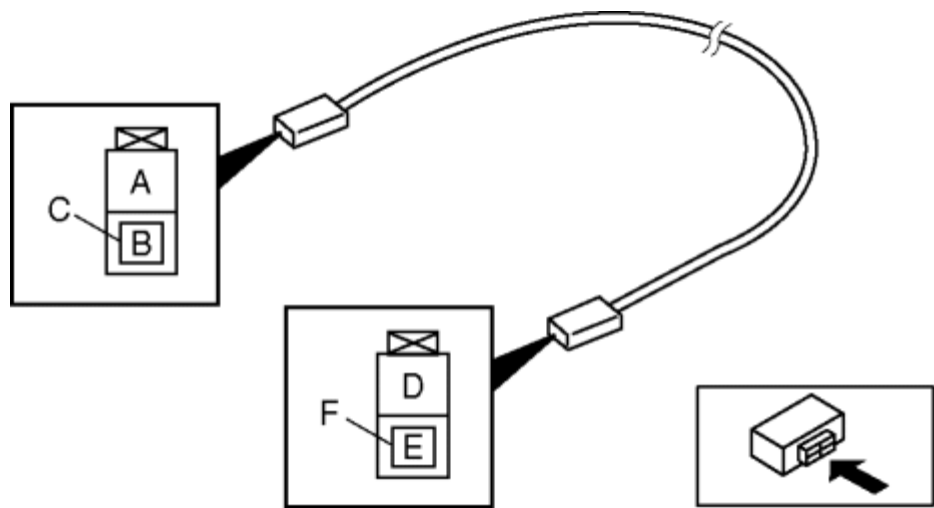
○—○ : Continuity

Test condition	Terminal					
	A	B	C	D	E	F
Under any condition	○				○	
		○				○
			○	○		

2008 - MX-5 - Body and Accessories

AM/FM ANTENNA FEEDER NO.2 INSPECTION

1. Verify that the continuity is as indicated in the table.



- If not as indicated in the table, replace the AM/FM antenna feeder No.2.

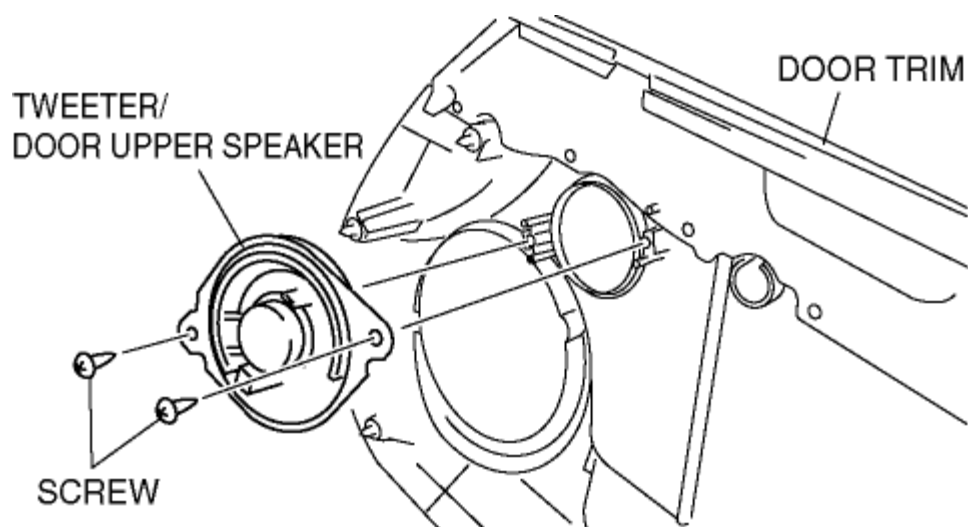
○—○ : Continuity

Test condition	Terminal					
	A	B	C	D	E	F
Under any condition	○			○		
		○			○	
			○			○

## 2008 - MX-5 - Body and Accessories

### TWEETER REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the door trim. (See [DOOR TRIM REMOVAL/INSTALLATION.](#))
4. Disconnect the connector.
5. Remove the screws.

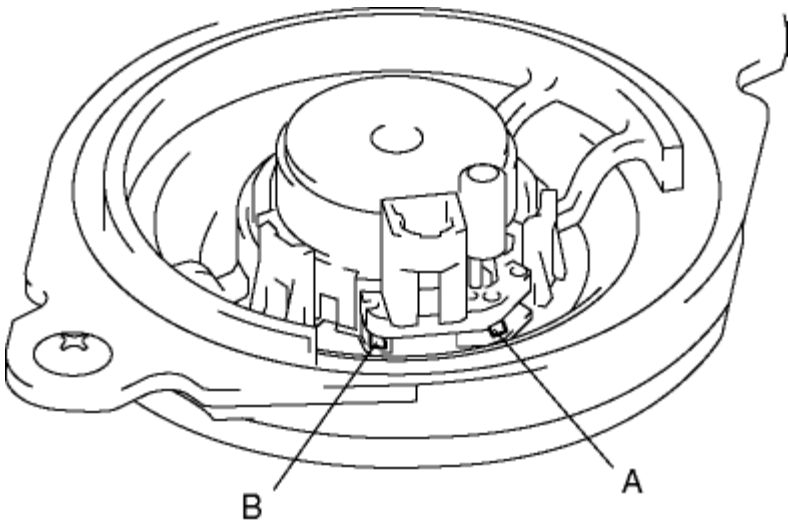


6. Remove the tweeter/door upper speaker.
7. Install in the reverse order of removal.

2008 - MX-5 - Body and Accessories

TWEETER INSPECTION

- 1. Inspect for resistance between the tweeter terminals using an ohmmeter.



- If the resistance is not within the specification, replace the tweeter.

○—○ : Resistance

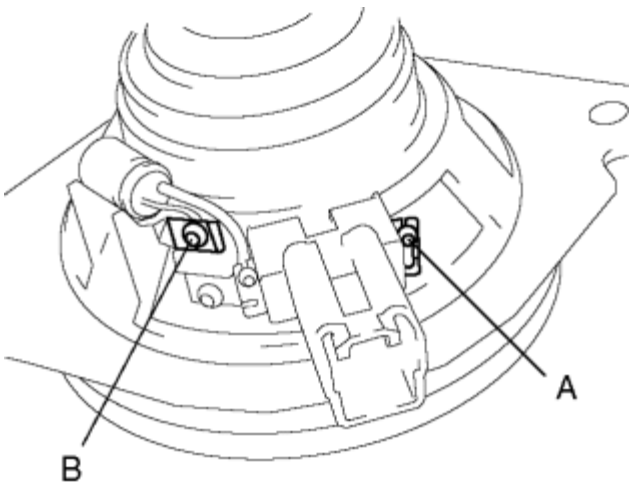
Test condition	Terminal	
	A	B
Under any condition	A circuit diagram showing a resistor symbol connected between two circular terminals. The left terminal is labeled 'A' and the right terminal is labeled 'B'. The resistor is represented by a zigzag line.	

R : 4 ohms

2008 - MX-5 - Body and Accessories


DOOR UPPER SPEAKER INSPECTION

1. Inspect for resistance between the door upper speaker terminals using an ohmmeter.



- If the resistance is not within the specification, replace the door upper speaker.

○⚡○ : Resistance

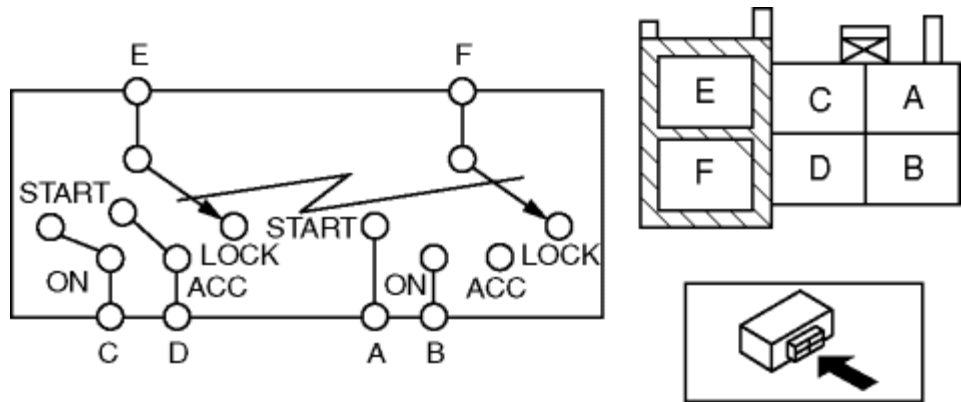
Test condition	Terminal	
	A	B
Under any condition		

R : 3.6 ohms

2008 - MX-5 - Body and Accessories

IGNITION SWITCH INSPECTION

1. Verify that the continuity between the ignition switch terminals is as indicated in the table.



- If not as indicated in the table, replace the ignition switch.

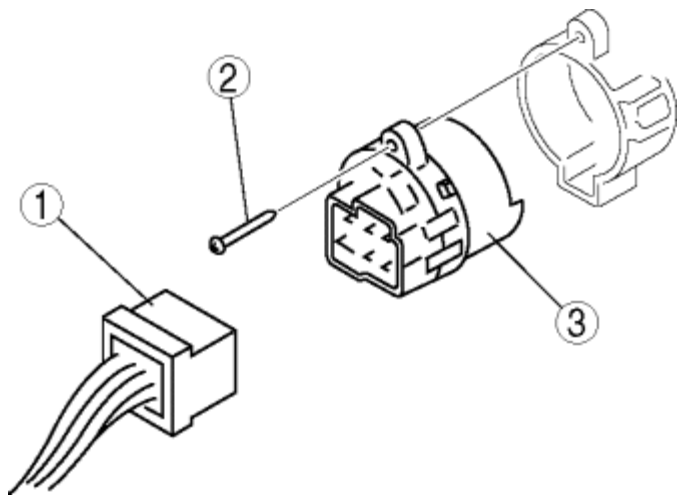
○—○: Continuity

Ignition key position	Terminal					
	E	F	D	C	B	A
LOCK						
ACC	○—○		○—○			
ON	○—○	○—○	○—○	○—○	○—○	
START	○—○	○—○	○—○	○—○		○—○

2008 - MX-5 - Body and Accessories

IGNITION SWITCH REMOVAL/INSTALLATION

- 1. Remove the battery cover.
- 2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
- 3. Remove the column cover. (See [COLUMN COVER REMOVAL/INSTALLATION.](#))
- 4. Remove in the order indicated in the table.



1	Connector
2	Screw
3	Ignition switch

- 5. Install in the reverse order of removal.



## 2008 - MX-5 - Body and Accessories

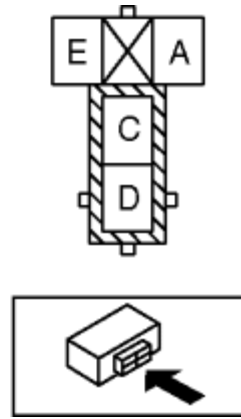
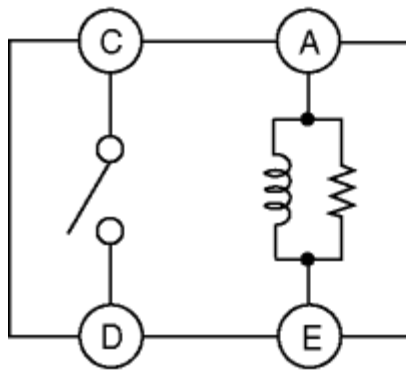
### RELAY INSPECTION

**Relay type**

Terminal type	Part name
Type A	<ul style="list-style-type: none"><li>• Main relay</li><li>• Starter relay</li><li>• Drive-by-wire relay</li><li>• Blower relay</li><li>• Fuel pump relay</li><li>• Front fog light relay</li><li>• A/C relay</li><li>• TNS relay</li><li>• Rear window defroster relay</li><li>• Horn relay</li><li>• Cooling fan relay No.1</li><li>• Cooling fan relay No.2</li><li>• Cooling fan relay No.3</li><li>• Trunk lid opener relay</li></ul>
Type B	<ul style="list-style-type: none"><li>• Headlight relay</li><li>• Ignition relay</li></ul>

**Type A**

1. Verify the continuity between the relay terminals.



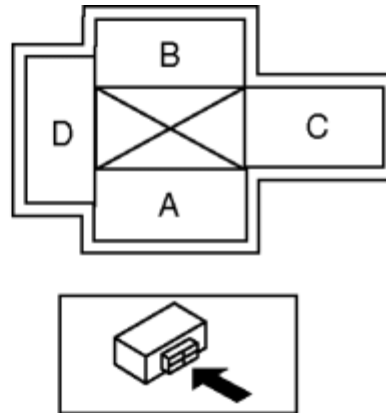
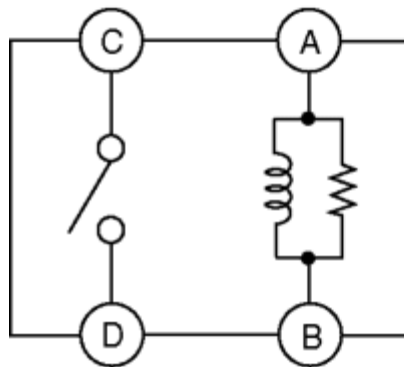
- If not as indicated in the table, replace the relay.

○—○ : Continuity

Step	Terminal			
	A	E	C	D
1	○—○			
2	B+	GND	○—○	

## Type B

1. Verify the continuity between the relay terminals.



- If not as indicated in the table, replace the relay.

○—○ : Continuity

Step	Terminal			
	A	B	C	D
1	○—○			
2	B+	GND	○—○	



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## 2008 - MX-5 - Body and Accessories

### FUSE SERVICE CAUTIONS

#### CAUTION:

- Determine and correct the cause of the burnt fuse before replacing it. If the fuse is replaced before doing this, it may burn again.

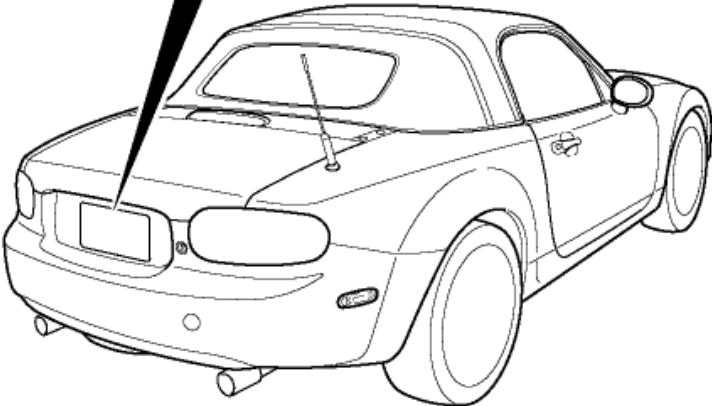
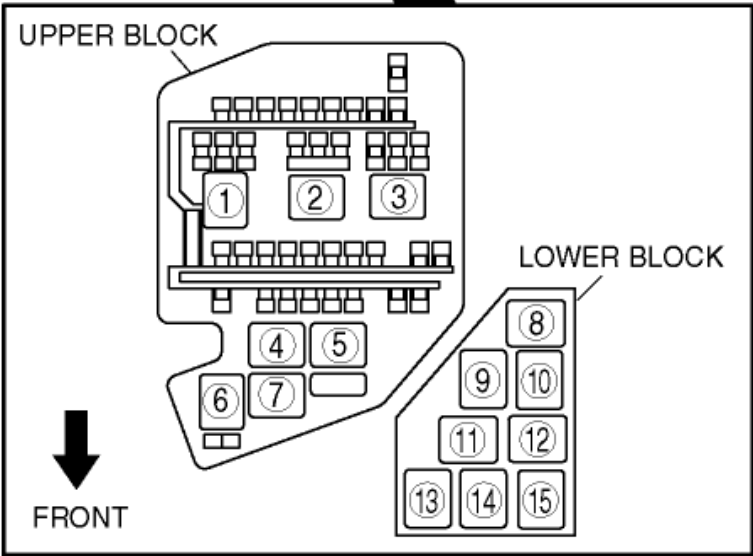
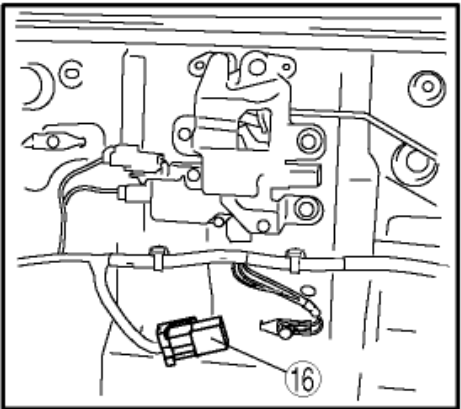
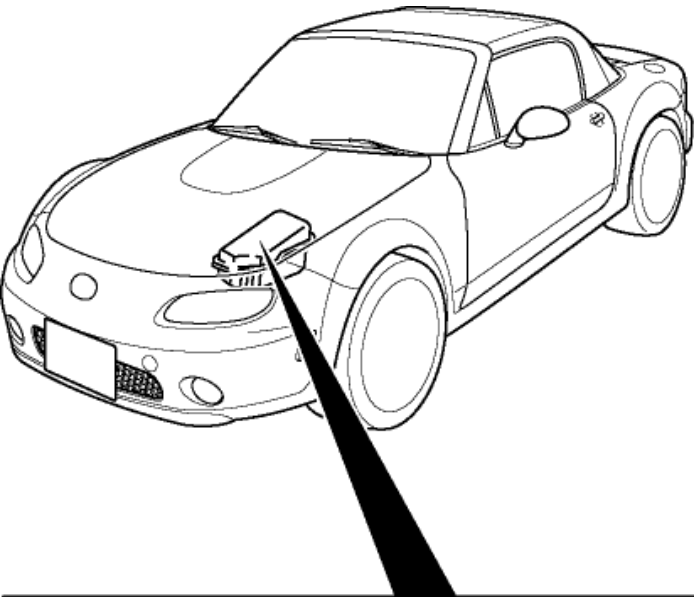
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RELAY LOCATION

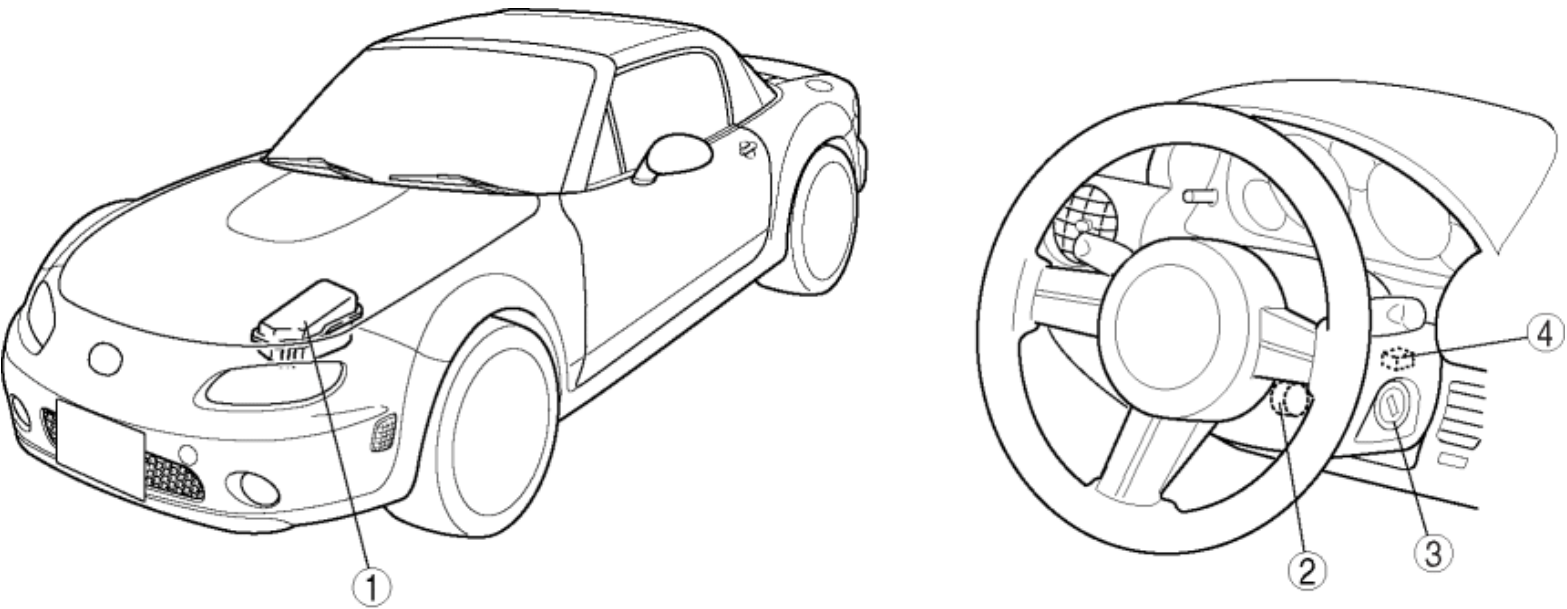


1	Main relay
2	Headlight relay
3	Ignition relay
4	Starter relay
5	Drive-by-wire relay
6	Blower relay

7	Fuel pump relay
8	Front fog light relay
9	A/C relay
10	TNS relay
11	Rear window defroster relay
12	Horn relay
13	Cooling fan relay No.3
14	Cooling fan relay No.2
15	Cooling fan relay No.1
16	Trunk lid opener relay

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POWER SYSTEM LOCATION INDEX



1	Main fuse block  (See <a href="#">UPPER BLOCK REMOVAL/INSTALLATION.</a> )  (See <a href="#">MAIN FUSE REMOVAL/INSTALLATION.</a> )  (See <a href="#">RELAY LOCATION.</a> )  (See <a href="#">RELAY INSPECTION.</a> )
2	Ignition switch  (See <a href="#">IGNITION SWITCH REMOVAL/INSTALLATION</a> )  (See <a href="#">IGNITION SWITCH INSPECTION.</a> )
3	Steering lock unit [advanced keyless system]  (See <a href="#">STEERING LOCK UNIT INSPECTION [ADVANCED KEYLESS SYSTEM].</a> )
4	Key reminder switch [except advanced keyless system]  (See <a href="#">KEY REMINDER SWITCH REMOVAL/INSTALLATION [EXCEPT ADVANCED KEYLESS SYSTEM]</a> )  (See <a href="#">KEY REMINDER SWITCH INSPECTION [EXCEPT ADVANCED KEYLESS SYSTEM].</a> )

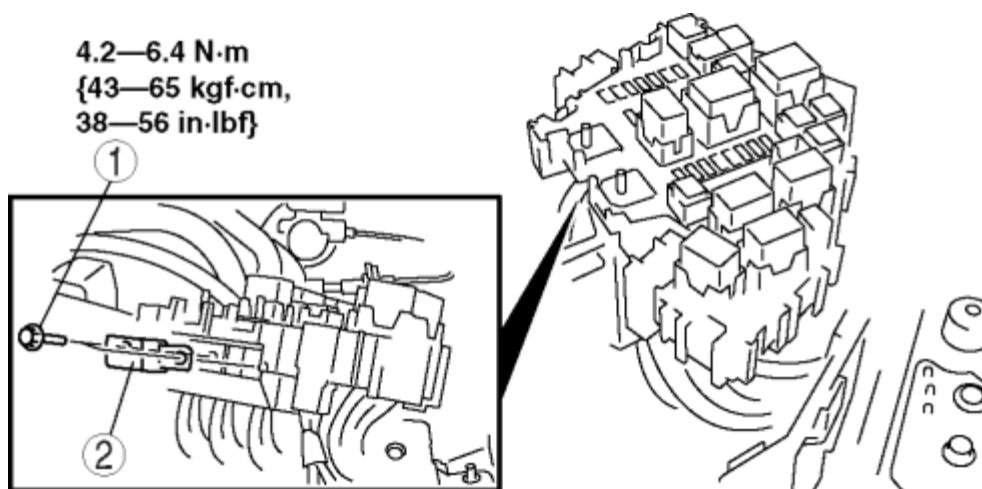




## 2008 - MX-5 - Body and Accessories

### MAIN FUSE REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#).)
3. Remove the upper block. (See [UPPER BLOCK REMOVAL/INSTALLATION](#).)
4. Remove in the order indicated in the table.



1 Bolt
2 Main fuse

5. Install in the reverse order of removal.

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## 2008 - MX-5 - Body and Accessories

### FUSE SERVICE WARNINGS

#### WARNING:

1. For vehicles with DSC, if the room fuse is disconnected, the stored initial position of the steering angle sensor will be cleared and the DSC will not operate properly, making the vehicle unsafe to drive. Perform the steering angle sensor initialization procedure after connecting the room fuse. (See [STEERING ANGLE SENSOR INITIALIZATION PROCEDURE](#).)

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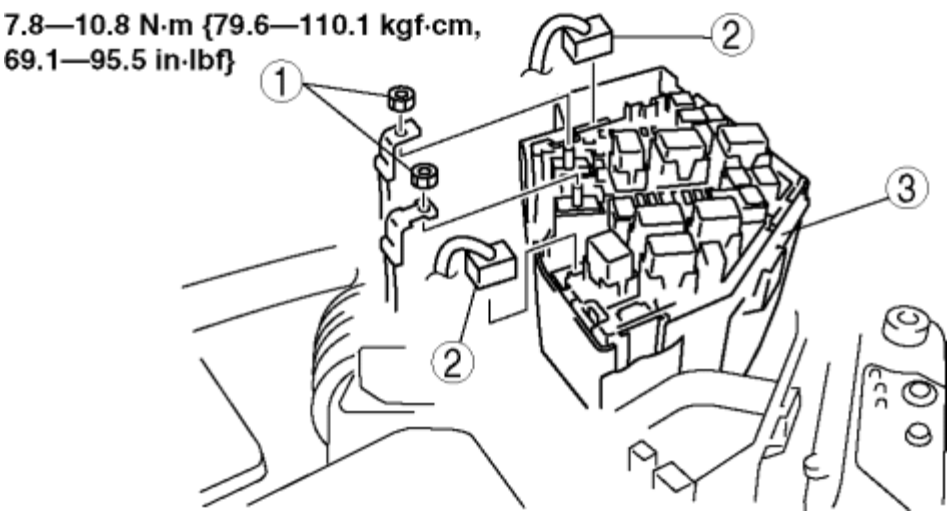
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## 2008 - MX-5 - Body and Accessories

### UPPER BLOCK REMOVAL/INSTALLATION

- 1. Remove the battery cover.
- 2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
- 3. Remove the main fuse block cover.
- 4. Remove in the order indicated in the table.

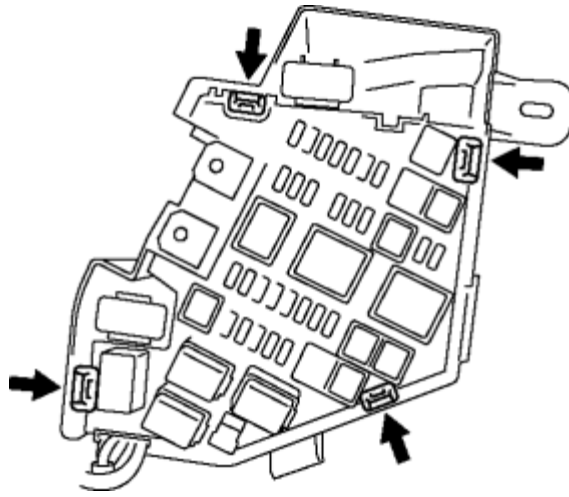


1	Nut
2	Connector
3	Upper block (See <a href="#">Upper Block Removal Note</a> )

- 5. Install in the reverse order of removal.

### Upper Block Removal Note

- 1. Press and remove the tabs on upper block at the positions indicated by the arrows.



2. Raise the upper block and remove it.

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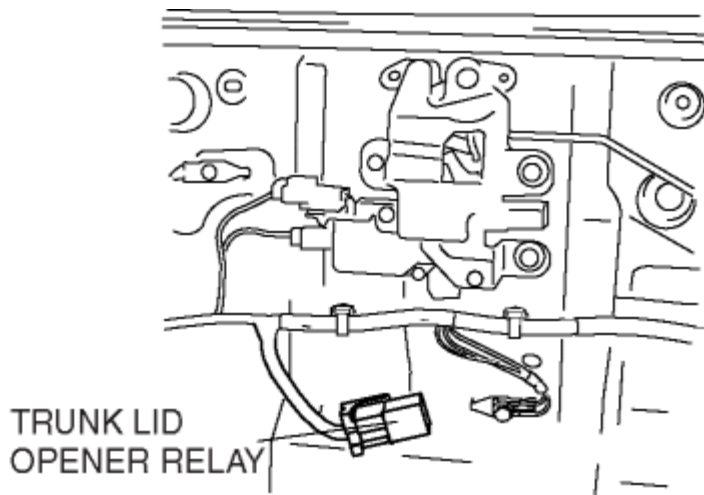
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## 2008 - MX-5 - Body and Accessories

### TRUNK LID OPENER RELAY REMOVAL/INSTALLATION

1. Remove the battery cover.
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\].](#))
3. Remove the trunk end trim. (See [TRUNK END TRIM REMOVAL/INSTALLATION.](#))
4. Remove the trunk lid opener relay.

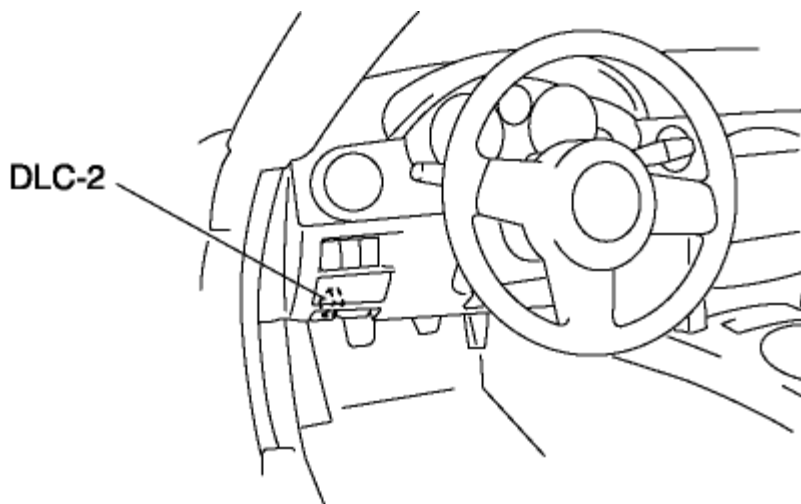


5. Install in the reverse order of removal.

## 2008 - MX-5 - Body and Accessories

### INSTRUMENT CLUSTER CONFIGURATION

1. Connect the M-MDS to the DLC-2.



2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.
  - When using the IDS (laptop PC)
    1. Select "Module Programming".
  - When using the PDS (Pocket PC)
    1. Select "Programming".
    2. Select "Module Programming".
3. Select "Programmable Module Installation".
4. Select "IC" and perform procedures according to directions on the M-MDS screen.
5. Retrieve DTCs using the M-MDS and verify that there is no DTC present.
  - If any DTC is present, perform applicable DTC inspection. (See [DTC TABLE \[INSTRUMENT CLUSTER\]](#).)

## 2008 - MX-5 - Body and Accessories

### INSTRUMENT CLUSTER INSPECTION

#### Speedometer

##### Using the input/output check mode

1. Inspect the speedometer by setting it to check code 12 of the input/output check mode. (See [INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE](#).)

##### Using a speedometer tester

1. Adjust the tire pressure to the specification.
2. Using a speedometer tester, verify that the tester reading is as indicated in the table below.

Speedometer tester indication (km/h)	Allowable range (km/h)
20	17—23
40	37—42
60	57—63
80	76—83
100	96—103
120	116—123
140	135—143

Speedometer tester indication (mph)	Allowable range (mph)
10	8—12

20	18—22
30	28—32
40	38—42
50	48—52
60	58—62
70	67—73
80	77—83

3. Verify that the speedometer reading is within the range indicated in the table.

- If the speedometer does not move or the indication is not within the allowable range, inspect the PCM and the related wiring harnesses.
  - If the PCM and the related wiring harnesses are normal, replace the instrument cluster.

## Tachometer

### Using the input/output check mode

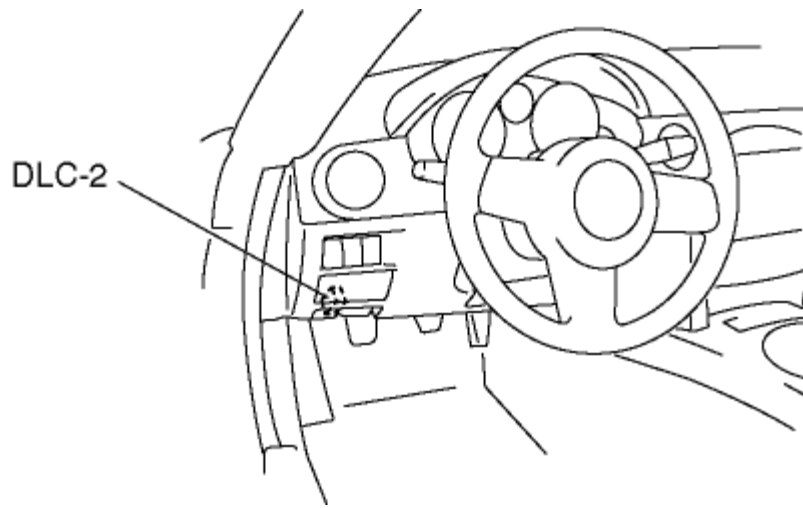
1. Inspect the tachometer by setting it to check code 13 of the input/output check mode. (See **INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE**.)

### Using M-MDS or external diagnostic equipment

#### CAUTION:

- If the engine speed exceeds the allowable range, the engine could be damaged. Therefore, when inspecting the tachometer, do not allow the engine speed to exceed the allowable range indication on the tachometer.
1. Connect the M-MDS to the DLC-2.





2. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.

- When using the IDS (laptop PC)
  - Select "DataLogger".
  - Select "Module".
  - Select "IC".
- When using the PDS (Pocket PC)
  - Select "Module Tests".
  - Select "IC".
  - Select "DataLogger".

3. Compare the data monitor item (IC\_TACHO) with the tachometer indication.

- If the tachometer does not operate properly, inspect the PCM and the related wiring harnesses.
  - If the PCM and the related harnesses do not have any malfunction, replace the instrument cluster.

## Fuel gauge

1. Inspect the fuel gauge by setting it to check code 23 of the input/output check mode. (See [INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE](#).)

## Water temperature gauge

1. Inspect the water temperature gauge by setting it to check code 25 of the input/output check mode. (See [INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE](#).)

## Oil Pressure gauge

1. Inspect the oil pressure gauge by setting it to check code 28 of the input/output check mode.  
(See **INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE**.)

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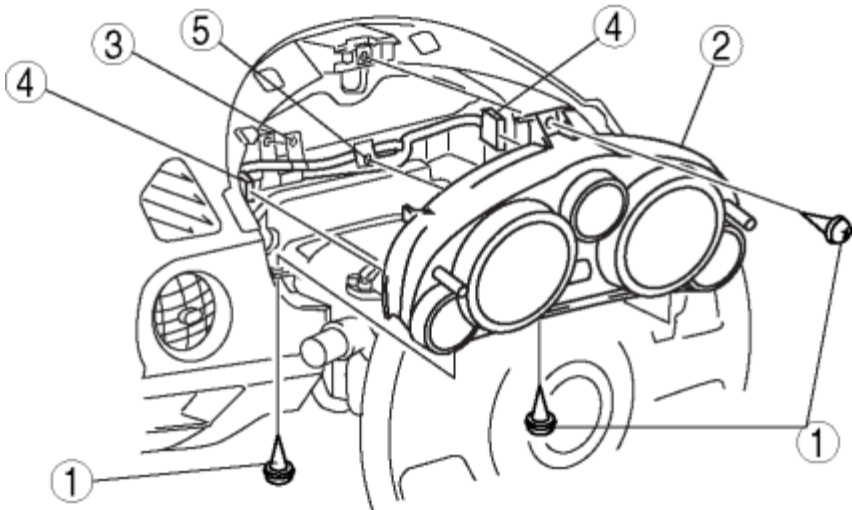
2008 - MX-5 - Body and Accessories

INSTRUMENT CLUSTER REMOVAL/INSTALLATION

CAUTION:

- When replacing the instrument cluster, the configuration procedure must be performed before removing the instrument cluster. Replacing the instrument cluster without performing the configuration procedure will result in system malfunction.

1. Perform the instrument cluster configuration when replacing it. (See [INSTRUMENT CLUSTER CONFIGURATION.](#))
2. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#))
3. Remove the meter hood. (See [METER HOOD REMOVAL/INSTALLATION.](#))
4. Remove the lower panel. (See [LOWER PANEL REMOVAL/INSTALLATION.](#))
5. Remove the column cover. (See [COLUMN COVER REMOVAL/INSTALLATION.](#))
6. Remove in the order indicated in the table.



1	Screw
2	Instrument cluster (See <a href="#">Instrument Cluster Removal Note.</a> )
3	Clip A
4	Connector

5Clip B

(See [Clip B Removal Note](#).)

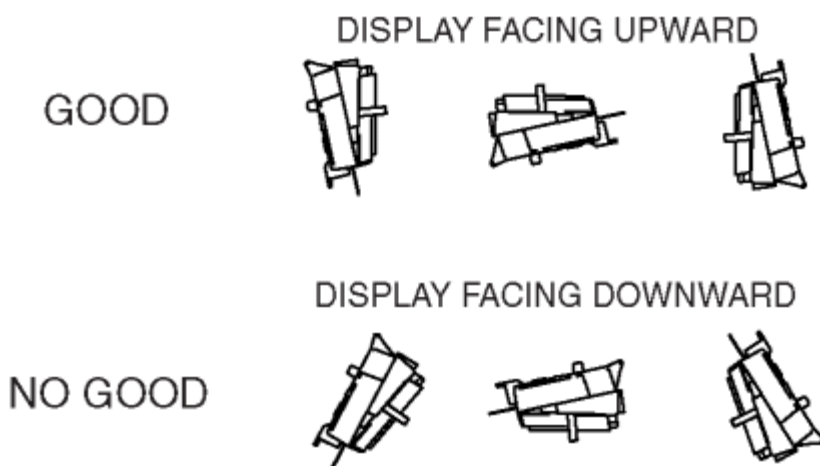
7. Install in the reverse order of removal.

8. When replacing the instrument cluster of vehicles with the immobilizer system, perform the following procedure:

- See **IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [ADVANCED KEYLESS SYSTEM]**, **IMMOBILIZER SYSTEM COMPONENT REPLACEMENT/KEY ADDITION AND CLEARING [KEYLESS ENTRY SYSTEM]**.

#### CAUTION:

- The removed instrument cluster should be placed with the display side up to prevent grease from leaking from the meters.



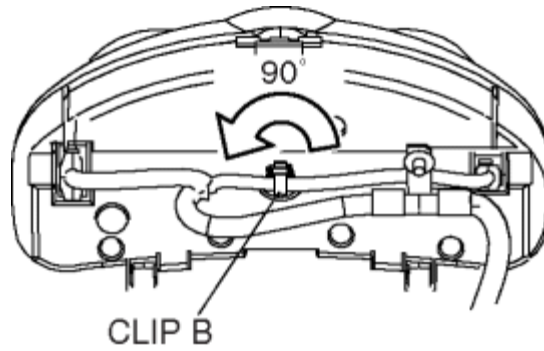
#### Instrument Cluster Removal Note

1. Rotate the instrument cluster in the direction of the arrow and remove the instrument cluster.



## Clip B Removal Note

1. Rotate the clip B **90°**, then remove the clip B from the instrument cluster.



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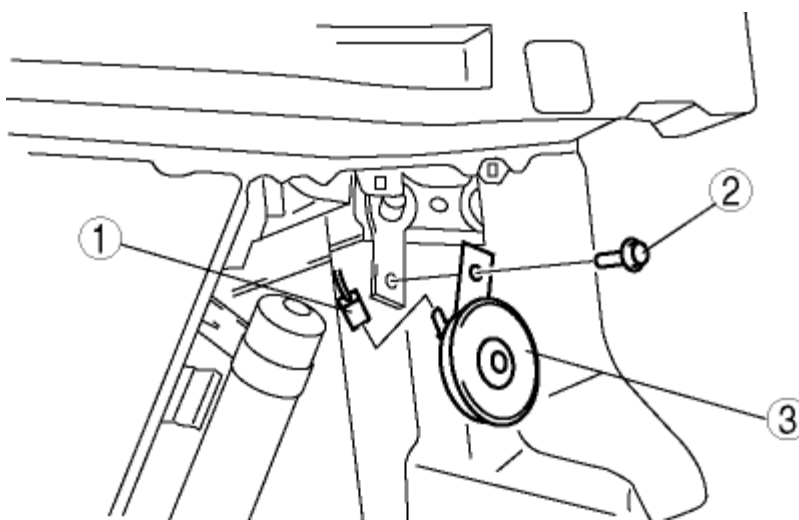
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## 2008 - MX-5 - Body and Accessories

### HORN REMOVAL/INSTALLATION

1. Disconnect the negative battery cable. (See [BATTERY REMOVAL/INSTALLATION \[LF\]](#))
2. Slightly bend back the under cover.
3. Remove in the order indicated in the table.

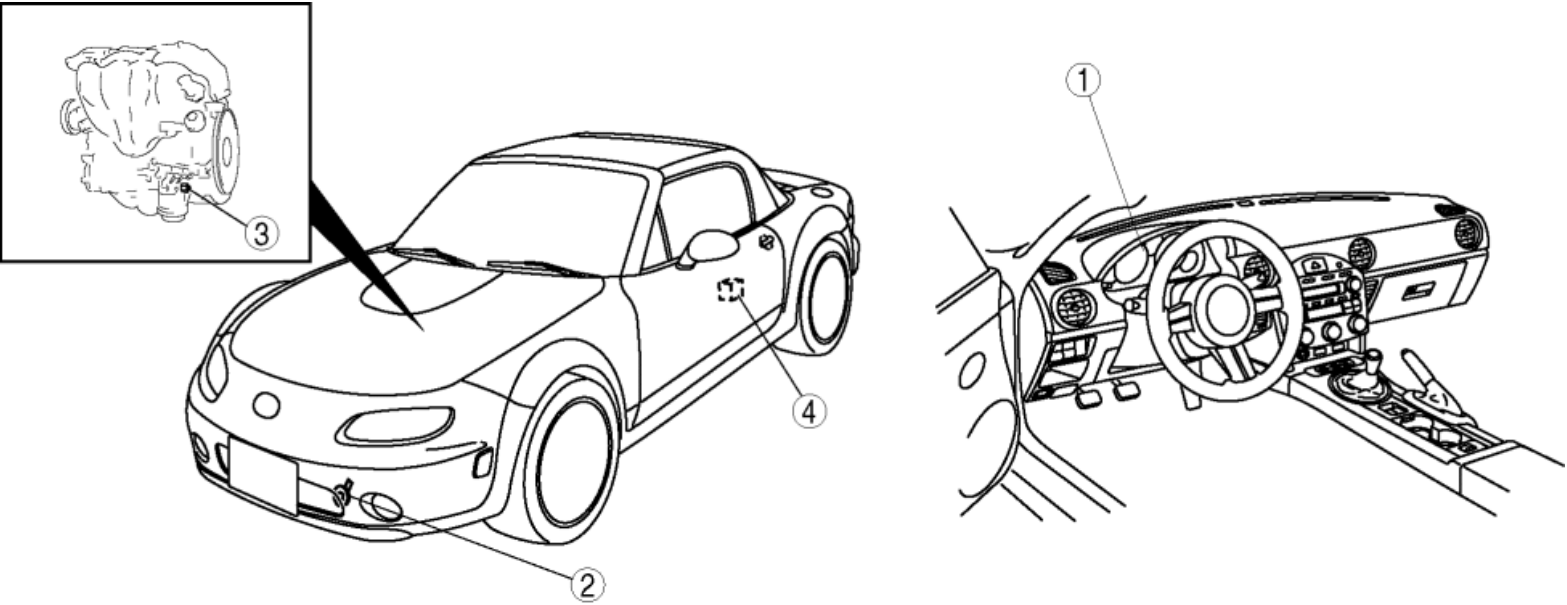


1	Connector
2	Bolt
3	Horn

4. Install in the reverse order of removal.

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INSTRUMENTATION/DRIVER INFO. LOCATION INDEX



1	Instrument cluster (See <a href="#">INSTRUMENT CLUSTER REMOVAL/INSTALLATION.</a> ) (See <a href="#">INSTRUMENT CLUSTER DISASSEMBLY/ASSEMBLY.</a> ) (See <a href="#">INSTRUMENT CLUSTER INSPECTION.</a> ) (See <a href="#">INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE.</a> )
2	Horn (See <a href="#">HORN REMOVAL/INSTALLATION.</a> )
3	Oil pressure switch (See <a href="#">OIL PRESSURE SWITCH INSPECTION.</a> )
4	Fuel gauge sender unit (See <a href="#">FUEL GAUGE SENDER UNIT INSPECTION.</a> )

## 2008 - MX-5 - Body and Accessories

### OIL PRESSURE SWITCH INSPECTION

1. Turn the ignition switch to the ON position and verify that the oil pressure gauge reading indicates L or below.
2. Start the engine and verify that the oil pressure gauge operates.
  - If the oil pressure gauge does not operate, inspect the related wiring harness.
    - If the related wiring harness is normal, inspect the oil pressure. (See [OIL PRESSURE INSPECTION \[LF\]](#),)
    - If the oil pressure is normal, replace the oil pressure switch.



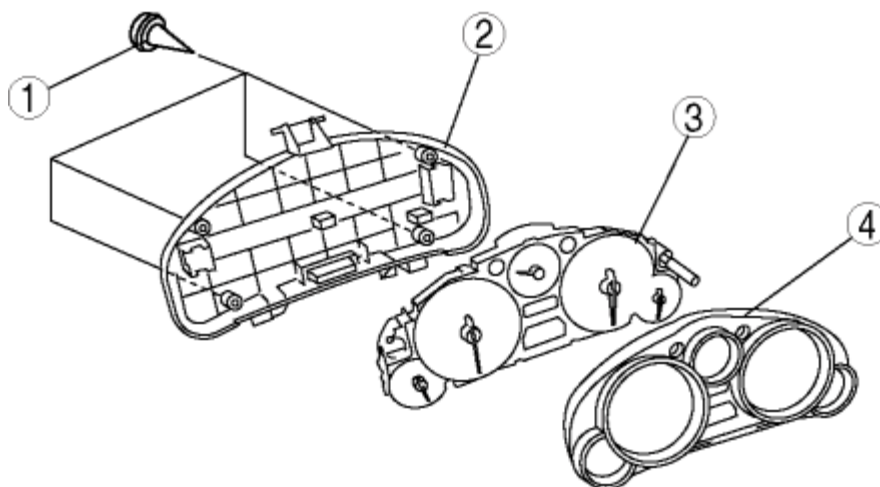
## 2008 - MX-5 - Body and Accessories

### INSTRUMENT CLUSTER DISASSEMBLY/ASSEMBLY

#### CAUTION:

- Do not drop the instrument cluster or damage the printed board. This will lead to a system malfunction.

1. Disassemble in the order indicated in the table.



1	Screw
2	Cover
3	Instrument cluster unit
4	Lens

2. Assemble in the reverse order of disassembly.

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INSTRUMENT CLUSTER INPUT/OUTPUT CHECK MODE

NOTE:

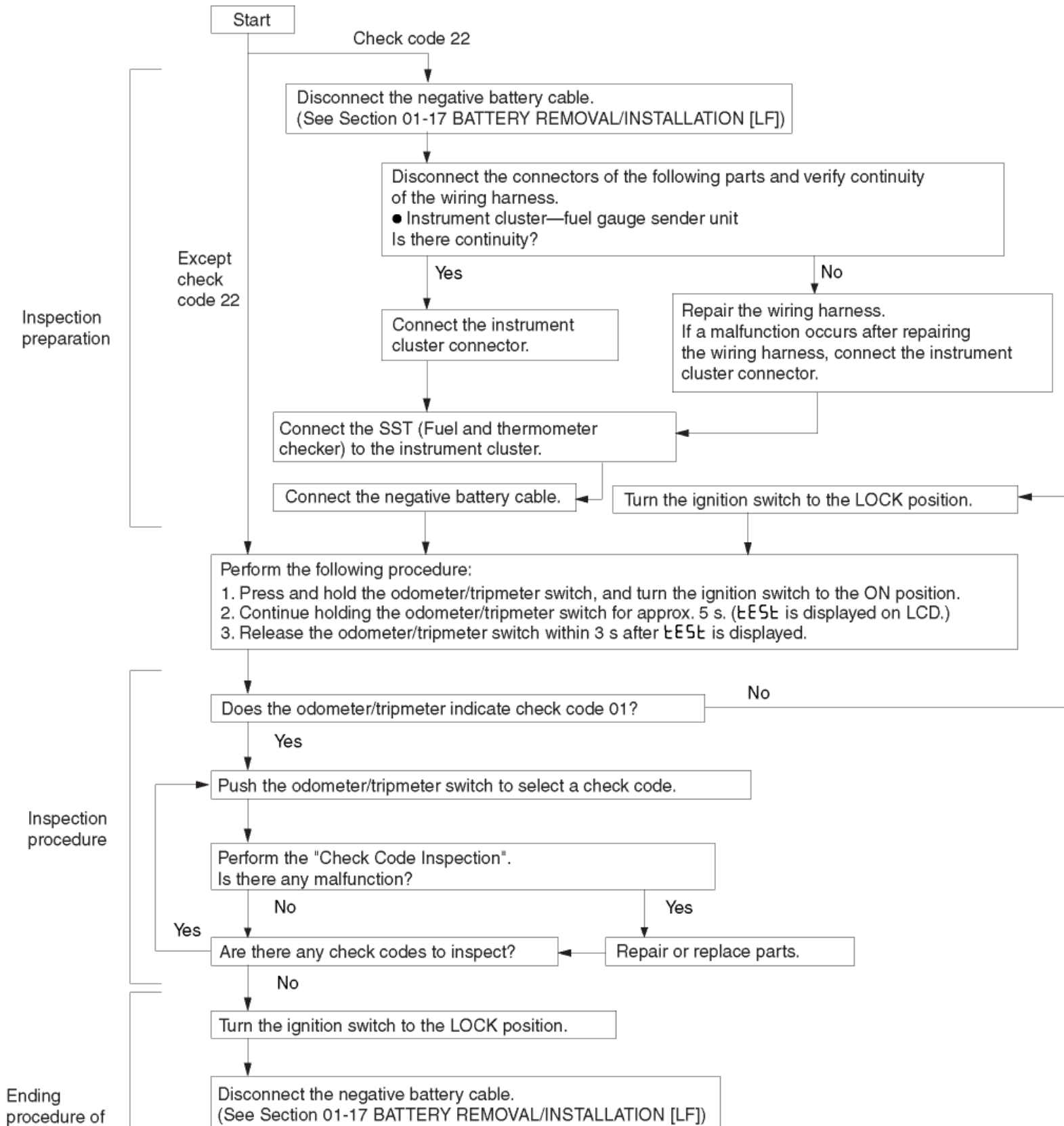
- In this mode, it is possible to verify the items in the following chart.

Check Code Table

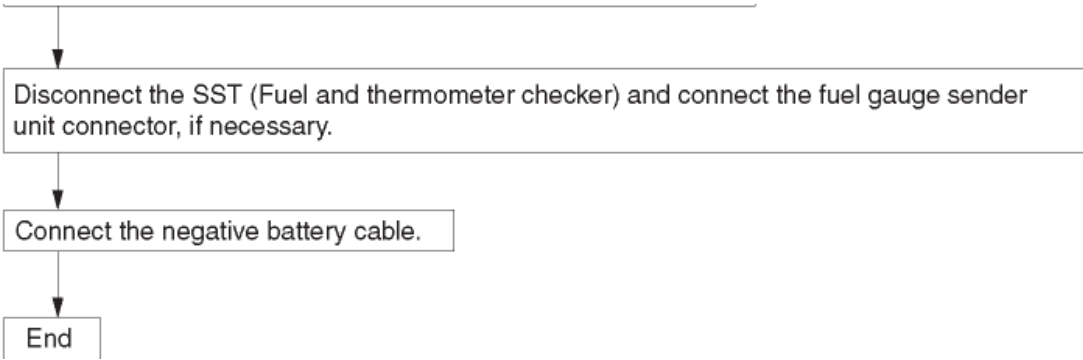
Check code	Check item	Related items
01	SAS control module	Seat belt warning alarm
04	Door switch	<ul style="list-style-type: none"><li>• Lights-on reminder warning alarm</li><li>• Key reminder warning alarm</li></ul>
08	TNS relay	<ul style="list-style-type: none"><li>• Lights-on reminder warning alarm</li><li>• Each illumination light</li></ul>
12	Speedometer	Speedometer
13	Tachometer	Tachometer
14	Buzzer	Buzzer
16	Fuel-level warning light	Fuel-level warning light
18	Ignition key illumination	Ignition key illumination
22	Fuel gauge sender unit	Fuel gauge
23	Fuel gauge	Fuel gauge
25	Water temperature gauge	Water temperature gauge
26	<ul style="list-style-type: none"><li>• Odometer/tripmeter (LCD)</li><li>• Warning and indicator light</li></ul>	<ul style="list-style-type: none"><li>• Odometer/tripmeter (LCD)</li><li>• Warning and indicator light</li></ul>
28	Oil pressure gauge	Oil pressure gauge
31	Key reminder switch	Key reminder warning alarm
57	Panel light control	Illumination light bulb
59	<ul style="list-style-type: none"><li>• CAN system</li><li>• Fuel gauge sender unit</li></ul>	<ul style="list-style-type: none"><li>• CAN system</li><li>• Fuel system</li></ul>

NOTE:

- Check codes which are not listed may be indicated, but they cannot be inspected.
- The check codes are displayed in numerical order. (While performing the inspection, if you want to inspect a check code with a number smaller than the code number you are currently inspecting, terminate the check mode then repeat the inspection from the beginning.)
- If a speed signal is input to the instrument cluster (the wheels are rotated), the input/output check mode will be cancelled.
- The check codes can be fast-forwarded by pushing and holding the odometer/tripmeter switch for **1 s or more**.



instrument cluster input/output check mode



Checking Order

- NOTE:**
- When inspecting more than two check codes, begin with the code with the highest ranking.

Priority order of inspection	Ignition switch position	Check code
1	ON	22
2		01, 04, 08, 12, 13, 14, 16, 18, 23, 25, 26, 28, 57, 59
3	LOCK	31

Check Code Inspection

Check code 01

Check code 01		Buckle switch and passenger sensing system		
STEP	INSPECTION CONDITION	DISPLAY	ACTION	
1	Unfasten driver-side seat belt. (Buckle switch ON)	on d	Go to the next step.	
		off d	Inspect the following parts: <ul style="list-style-type: none"><li>Buckle switch (driver-side)</li><li>SAS control module</li><li>Wiring harness (Buckle switch (driver-side)—SAS control module)</li></ul>	
		Err 1	Using the DTC and PID of SAS control module, inspect the SAS control module, buckle switch and the related wiring harnesses. <ul style="list-style-type: none"><li>If there is no malfunction, inspect for continuity between SAS control module terminal 1X and instrument cluster terminal 2A (wiring harness-side).<ul style="list-style-type: none"><li>If there is continuity, replace the</li></ul></li></ul>	

			instrument cluster.
2	Fasten driver-side seat belt. (Buckle switch OFF)	offFd	Go to the next step.
		on d	Inspect the following parts: <ul style="list-style-type: none"> <li>• Buckle switch (driver-side)</li> <li>• SAS control module</li> <li>• Wiring harness (Buckle switch (driver-side)—SAS control module)</li> </ul>
		Err 1	Using the DTC and PID of SAS control module, inspect the SAS control module, buckle switch and the related wiring harnesses. <ul style="list-style-type: none"> <li>• If there is no malfunction, inspect for continuity between SAS control module terminal 1X and instrument cluster terminal 2A (wiring harness-side).               <ul style="list-style-type: none"> <li>▪ If there is continuity, replace the instrument cluster.</li> </ul> </li> </ul>
3	Seat one person in the passenger's seat, and unfasten passenger-side seat belt. (Seat weight sensor and buckle switch ON)	on P	Go to the next step.
		offFP	Inspect the following parts: <ul style="list-style-type: none"> <li>• Buckle switch (passenger-side)</li> <li>• Seat weight sensor control module</li> <li>• Seat weight sensor</li> <li>• SAS control module</li> <li>• Wiring harness (Buckle switch (passenger-side)—SAS control module, seat weight sensor—Seat weight sensor control module—SAS control module)</li> </ul>
		Err 1	Using the DTC and PID of SAS control module, inspect the SAS control module, buckle switch (driver-side, passenger-side), seat weight sensor control module, seat weight sensor and related wiring harnesses. <ul style="list-style-type: none"> <li>• If there is no malfunction, inspect for the continuity between SAS control module terminal 1X and instrument cluster terminal 2A (wiring harness-side).               <ul style="list-style-type: none"> <li>▪ If there is a continuity, replace the instrument cluster.</li> </ul> </li> </ul>
4	Seat one person in the passenger's seat, and fasten passenger-side seat belt. (Seat weight sensor ON and buckle switch OFF)	offFP	Input signal to the instrument cluster is normal.
	Seat no person in the passenger's seat, and unfasten passenger-side seat belt. (Seat weight sensor OFF and buckle switch ON)  Seat no person in the passenger's seat, and fasten passenger-side seat belt. (Seat weight sensor and buckle switch OFF)	on P	Inspect the following parts: <ul style="list-style-type: none"> <li>• Buckle switch (passenger-side)</li> <li>• Seat weight sensor control module</li> <li>• Seat weight sensor</li> <li>• SAS control module</li> <li>• Wiring harness (Buckle switch (passenger-side)—</li> </ul>

			SAS control module, seat weight sensor—Seat weight sensor control module—SAS control module)
		Err 1	Using the DTC and PID of SAS control module, inspect the SAS control module, buckle switch (driver-side, passenger-side), seat weight sensor control module, seat weight sensor and the related wiring harnesses. <ul style="list-style-type: none"> <li>If there is no malfunction, inspect for continuity between SAS control module terminal 1X and instrument cluster terminal 2A (wiring harness-side).</li> <li>If there is continuity, replace the instrument cluster.</li> </ul>
		Err 2	

Check code 04

Check code 04		Door switch ON/OFF signal	
STEP	INSPECTION CONDITION	DISPLAY	ACTION
1	Open the driver-side door. (The door switch is on.)	on	Close the driver-side door, then go to the next step.
		off	Verify that the voltage of instrument cluster terminal 2E is <b>1.0 V or less</b> . <ul style="list-style-type: none"> <li>If the voltage is as specified, replace the instrument cluster.</li> <li>If the voltage is not as specified, inspect the following parts:               <ul style="list-style-type: none"> <li>Door switch</li> <li>Wiring harness (Instrument cluster—door switch)</li> </ul> </li> </ul>
2	Close all doors.(Door switches are off.)	on	Verify that the voltage of instrument cluster terminal 2E is <b>B+</b> . <ul style="list-style-type: none"> <li>If the voltage is as specified, replace the instrument cluster.</li> <li>If the voltage is not as specified, inspect the following parts:               <ul style="list-style-type: none"> <li>Door switch</li> <li>Wiring harness (Instrument cluster—door switch)</li> </ul> </li> </ul>
		off	Input signal to the instrument cluster is normal.

Check code 08

Check code 08		TNS relay ON/OFF signal	

STEP	INSPECTION CONDITION	DISPLAY	ACTION
1	Turn the headlight switch to the TNS position. (TNS relay ON)	00	Go to the next step.
		off	Verify that the voltage of instrument cluster terminal 1B is <b>B+</b> . <ul style="list-style-type: none"> <li>If the voltage is as specified, replace the instrument cluster.</li> <li>If the voltage is not as specified, inspect the following parts:               <ul style="list-style-type: none"> <li>TNS relay</li> <li>Wiring harness (Battery—TNS relay—instrument cluster)</li> </ul> </li> </ul>
2	Turn the headlight switch off. (TNS relay OFF)	00	Verify that the voltage of the instrument cluster terminal 1B is <b>1.0 V or less</b> . <ul style="list-style-type: none"> <li>If the voltage is as specified, replace the instrument cluster.</li> <li>If the voltage is not as specified, inspect the following parts:               <ul style="list-style-type: none"> <li>TNS relay</li> <li>Wiring harness (TNS relay—instrument cluster)</li> </ul> </li> </ul>
		off	Input signal to the instrument cluster is normal.

#### Check code 12

Check code 12	Speedometer display signal		
INSPECTION CONDITION	DISPLAY	ACTION	
After selecting check code 12, wait for <b>approx. 2 s</b> .	00	The speedometer needle moves full scale then returns to <b>approx. 60 km/h</b> or <b>approx. 60mph</b> .	The speedometer is normal.
		Except above	Replace the instrument cluster.
	Err	—	

#### Check code 13

Check code 13	Tachometer operation signal		
INSPECTION CONDITION	DISPLAY	ACTION	
After selecting check code 13, wait for <b>approx. 2 s</b> .		The tachometer needle moves full scale then returns to <b>approx. 3,000 rpm</b> .	The tachometer is normal.

	00	Except above	Replace the instrument cluster.
	Err		

Check code 14

Check code 14	Buzzer operation signal		
INSPECTION CONDITION	DISPLAY	ACTION	
After selecting check code 14, wait <b>approx. 2 s.</b>	00	The buzzer sounds.	The buzzer is normal.
		The buzzer does not sound.	Replace the instrument cluster.

Check code 16

Check code 16	Fuel-level warning light flashing signal		
INSPECTION CONDITION	DISPLAY	ACTION	
After selecting check code 16, wait <b>approx. 2 s.</b>	00 (FLASHING)	Fuel-level warning light flashes <b>three times.</b>	The fuel-level warning light is normal.
		Except above	Replace the instrument cluster.

Check code 18

Check code 18	Ignition key illumination control signal		
INSPECTION CONDITION	DISPLAY	ACTION	
After selecting check code 18, wait <b>approx. 2 s.</b>	00 (FLASHING)	Ignition key illumination flashes <b>three times.</b>	The ignition key illumination is normal.
		Except above	Verify that the voltage of instrument cluster terminal 1K is <b>B+</b> . <ul style="list-style-type: none"> <li>If the voltage is as specified, replace the instrument cluster.</li> <li>If the voltage is not as specified, inspect the following parts:               <ul style="list-style-type: none"> <li>Ignition key illumination bulb</li> <li>Wiring harness (Battery—ignition key illumination—instrument cluster)</li> </ul> </li> </ul>



Check code 22

Check code 22		Fuel level signal	
STEP	INSPECTION CONDITION	DISPLAY	ACTION
1	Select check code 22 with the fuel gauge sender unit connector disconnected.	252	Go to the next step.
		255	
		Except above	Go to the Step 6.
2	Connect terminals 2R and 2T of the instrument cluster.	000	Go to the next step.
		003	
		Except above	Go to the Step 6.
3	Using the <b>SST</b> (Fuel and thermometer checker) or resistor, input <b>20 ohms</b> between instrument cluster terminals 2R and 2T.	017	Go to the next step.
		023	
		Except above	Go to the Step 6.
4	Using the <b>SST</b> (Fuel and thermometer checker) or resistor, input <b>60 ohms</b> between instrument cluster terminals 2R and 2T.	057	Go to the next step.
		063	
		Except above	Go to the Step 6.
5	Using the <b>SST</b> (Fuel and thermometer checker) or resistor, input <b>100 ohms</b> between instrument cluster terminals 2R and 2T.		Inspect the fuel gauge sender unit.

097  
|  
103

Except above Go to the next step.

- 6 Inspect the wiring harness and connector between instrument cluster and fuel gauge sender unit.
- If there is any malfunction, repair or replace the wiring harness or connector.
  - If there is no malfunction, replace the instrument cluster.


#### Check code 23

Check code 23	Fuel gauge operation signal		
INSPECTION CONDITION	DISPLAY	ACTION	
After selecting check code 23, wait <b>approx. 2 s.</b>	00	The fuel gauge indicates status in the following order <b>approx. every 2 s.</b> <ul style="list-style-type: none"> <li>• F → 1/2 → E → F (fixed)</li> </ul>	The fuel gauge is normal.
		Except above	Replace the instrument cluster.
	Err	Replace the instrument cluster.	



#### Check code 25

Check code 25	Water temperature gauge operation signal		
INSPECTION CONDITION	DISPLAY	ACTION	
After selecting check code 25, wait approx. <b>2 s.</b>	00	The water temperature gauge indicates status in the following order <b>approx. every 2 s.</b> <ul style="list-style-type: none"> <li>• H → Center → C → H (fixed)</li> </ul>	The water temperature gauge is normal.
		Except above	Replace the instrument cluster.
	Err	Replace the instrument cluster.	

#### Check code 26

Check code 26	Odometer/tripmeter display signal		
INSPECTION CONDITION	DISPLAY	ACTION	
Select check code 26.		<ul style="list-style-type: none"> <li>• Display is normal.</li> <li>• Warning and indicator light illuminated.               <ul style="list-style-type: none"> <li>▪ Generator warning light</li> <li>▪ AT warning light</li> <li>▪ DSC indicator light</li> <li>▪ DSC OFF light</li> <li>▪ ABS warning light</li> <li>▪ Brake system warning light</li> <li>▪ Selector indicator light</li> <li>▪ MIL</li> <li>▪ Cruise set indicator light</li> <li>▪ Cruise main indicator light</li> <li>▪ Security light</li> <li>▪ Keyless warning light</li> <li>▪ Keyless indicator light</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• The odometer/tripmeter is normal.</li> <li>• Warning and indicator is normal.</li> </ul>
		Except above	Replace the instrument cluster.


Check code 28

Check code 28	Oil pressure gauge operation signal		
INSPECTION CONDITION	DISPLAY	ACTION	
After selecting check code 28, wait approx. 2 s.		The oil pressure gauge indicates status in the following order <b>approx. every 2 s.</b> <ul style="list-style-type: none"> <li>• H → Center → L → H (fixed)</li> </ul>	The oil pressure gauge is normal.
		Except above	Replace the instrument cluster.
		Replace the instrument cluster.	

Check code 31		Key reminder switch ON/OFF signal	
STEP	INSPECTION CONDITION	DISPLAY	ACTION
1	Remove the key from the steering lock, then reinsert the key into the steering lock after selecting check code 31. (The key reminder switch is on.)	ON	Go to the next step.
		OFF	<p>Verify that the voltage of instrument cluster terminal 2C is <b>B+</b>.</p> <ul style="list-style-type: none"><li>• If the voltage is as specified, replace the instrument cluster.</li><li>• If the voltage is not as specified, inspect the following parts:<ul style="list-style-type: none"><li>▪ Key reminder switch</li><li>▪ Wiring harness (Battery—key reminder switch—instrument cluster)</li></ul></li></ul>
2	Remove the key from the steering lock. (The key reminder switch is off.)	ON	<p>Verify that the voltage of instrument cluster terminal 2C is <b>1.0 V or less</b>.</p> <ul style="list-style-type: none"><li>• If the voltage is as specified, replace the instrument cluster.</li><li>• If the voltage is not as specified, inspect the following parts:<ul style="list-style-type: none"><li>▪ Key reminder switch</li><li>▪ Wiring harness (Key reminder switch—instrument cluster)</li></ul></li></ul>
		OFF	Input signal to the instrument cluster is normal.





Check code 57



Check code 57		Panel light control signal	
INSPECTION CONDITION	DISPLAY	ACTION	

Turn the headlight switch to the TNS position.  After selecting check code 57, wait <b>approx. 2 s.</b>		Illumination light (hazard warning switch, center panel module, etc.) flashes <b>three times</b> .	The panel light control signal is normal.
	 (FLASHING)	Except above	Verify that the voltage of instrument cluster terminal 1F is <b>B+</b> . <ul style="list-style-type: none"> <li>• If the voltage is as specified, replace the instrument cluster.</li> <li>• If the voltage is not as specified, inspect the following parts:               <ul style="list-style-type: none"> <li>▪ Illumination light (hazard warning switch, center panel module, etc.)</li> <li>▪ Wiring harness (Instrument cluster—illumination lights—TNS relay)</li> </ul> </li> </ul>

Check code 59

Diagnostic procedure

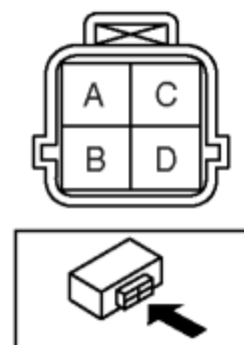
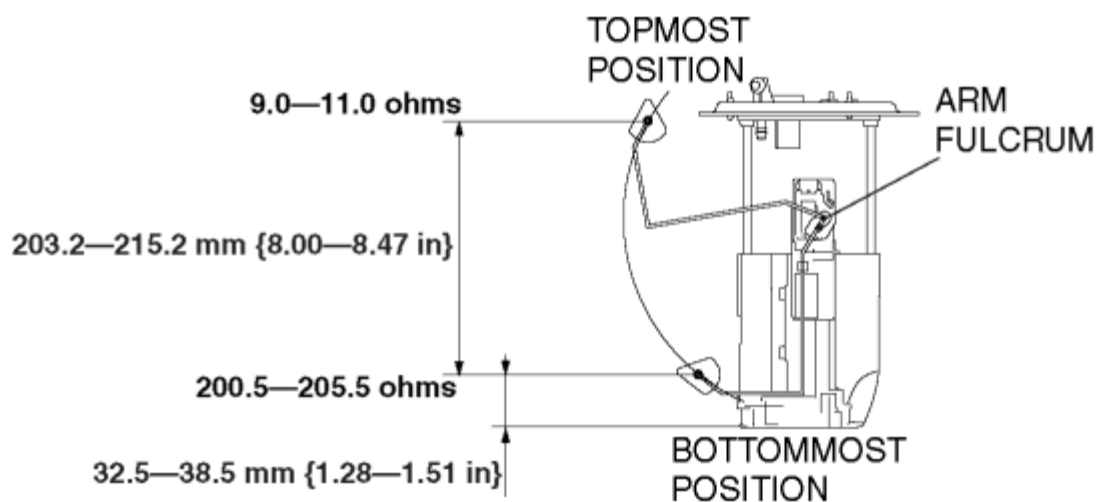
Check code 59		CAN system/fuel system	
STEP	INSPECTION	INDICATION	ACTION
1	The three digits number is indicated after selecting check code 59. Confirm the first digit from the right.	First digit from the right 	The CAN system is normal.  Go to next step.
		First digit from the right 	The DTC of CAN system is detected.  Perform the DTC inspection. (See <a href="#">DTC TABLE [MULTIPLEX COMMUNICATION SYSTEM]</a> ) <ul style="list-style-type: none"> <li>• If the CAN system is normal, replace the instrument cluster.</li> </ul> Go to next step.
2	Confirm the second digit from the right.	Second digit from the right 	The wiring harnesses between the fuel gauge sender unit and instrument cluster are normal.  Go to next step.
		Second digit from the right 	Inspect following parts. <ul style="list-style-type: none"> <li>• Fuel gauge sender unit</li> <li>• Wiring harness (Fuel gauge sender unit—instrument cluster)               <ul style="list-style-type: none"> <li>▪ If fuel gauge sender unit and wiring harness are normal, replace the instrument cluster.</li> </ul> </li> </ul>

			Go to next step.
3	Confirm the third digit from the right.	Third digit from the right 	The fuel pulse signal from the PCM is normal.
		Third digit from the right 	Inspect the PCM. (See <a href="#">DTC TABLE [LF]</a> , <a href="#">PCM INSPECTION [LF]</a> ) <ul style="list-style-type: none"><li>• If the PCM is normal, replace the instrument cluster.</li></ul>

## 2008 - MX-5 - Body and Accessories

### FUEL GAUGE SENDER UNIT INSPECTION

1. Move the float to the topmost and bottommost positions, and verify that the resistance between terminals A and C of the unit and the position of the float are as indicated in the figure.



- If they are not as indicated, replace the fuel gauge sender unit.

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BODY ELECTRICAL SYSTEM

Item		Specifications
Exterior light bulb capacity (W)	Headlight bulb (High-beam)	65 × 2
	Discharge headlight bulb (low-beam)	35 × 2
	Halogen headlight bulb (low-beam)	55 × 2
	Parking light bulb	5 × 2
	Front fog light bulb	55 × 2
	Front turn light bulb	21 × 2
	Front side marker light bulb	5 × 2
	Brake/taillight bulb	21/5 × 2
	Rear turn light bulb	21 × 2
	Back-up light bulb	18 × 2
	License plate light bulb	5 × 1
	High-mount brake light bulb (LED)	1
Interior light bulb capacity (W)	Map light bulb	10 × 1
	Trunk compartment light bulb	8 × 1
	Ignition key illumination bulb	1.4 × 1

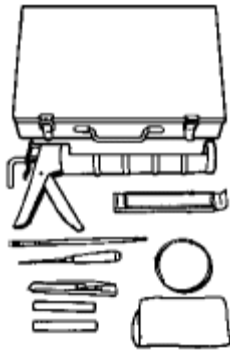
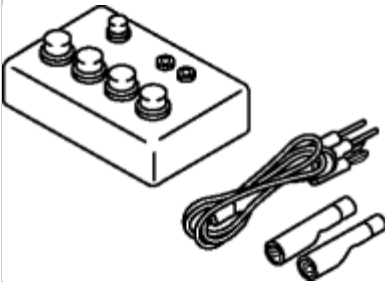




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BODY AND ACCESSORIES SST

49 0305 870A Window Tool Set		49 N088 0A0 Fuel & Thermometer Checker	
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